



Goodrich Corp.
Turbine Component Services
Peabody

Presented by Steve Mahoney



Peabody Expertise

A Service Source specializing in hot section turbine components with emphasis on Aftermarket Repair & Overhaul supplemented by OEM brazing & coating



Agenda for this Presentation

- Provide a tool as an example of Aspect Analyses
- How significant aspects become objectives and targets
- A good Internal Audit and Management Review lead to an EMS that is implemented and maintained.



First Steps

- Under General Requirements:

We defined the scope of our environmental management system and set clear boundaries for our system

- TCS is an FAA certificated repair station with license to work on hot section components of a variety of gas turbine engines. It also provides metallurgical services to aircraft turbine manufacturers. Its manufacturing activities are performed in two buildings:
- #1 Fifth Street, Peabody, MA 01961 - approximately 174,024 square feet in size
- #8 Fifth Street, Peabody, MA 01961 - approximately 127,154 square feet in size
- An additional property that TCS owns is located at #6 Fifth Street, MA 01961 - approximately 52,391 square feet.



We endorsed the Company EHS Policy rather than creating a separate site policy

Policy

Goodrich Corporation is committed to achieving excellence in environment, health and safety performance and to providing our customers with products and services designed, produced and maintained to meet or exceed their expectations and Goodrich specifications. These products and services will be provided while meeting or exceeding all applicable regulatory requirements and other requirements to which the company subscribes and in a manner that prevents pollution. We will utilize the policy deployment process to meet quality and EHS requirements while pursuing continuous improvement and reflecting our vision of *Creating Value Through Excellence in People, Quality and Innovation*. (GRMA-001-POL-00, Section 5.3)



Plant Manager

We listed all of the facility's
Legal Requirements



Permit Description	Governing Board	Identification #, Regulation #	Reg. D a t e	Exp. D a t e	Cost	Aspect	Impact
Air Registration, Conventional Source-Minor, 1 Fifth St.	MA Dept. of Environmental Protection P.O. Box 3584 Boston, MA 02241-3584	Account # 1197659 310 CMR 7.02, 7.08, etc.	No longer needed as of ruling by Mark Wert, Project Manager, MADEP on 8/28/07. (See email in Communications Log) Data submitted by Dan Westerberg from Irwin Engineers on behalf of TCS.				
Air Registration, Conventional Source-Minor, 8 Fifth St.	MA Dept. of Environmental Protection P.O. Box 3584 Boston, MA 02241-3584	Account # 1191318 310 CMR 7.02, 7.08, etc.	8/15/10	8/15/13	\$325	VOC's Solid particulate NOx CO ₂	Pollution from heating fuel, powders, volatile organics
Flammable Materials Permit (\$50.00)	MA Department of Public Safety-Fire Prevention 1010 Commonwealth Ave., Boston	Class A: 120,00 g.f. gaseous hydrogen	4/30/10	4/30/11	\$50	Hydrogen gas	Potential Explosive
Flammable Materials License	Peabody Fire Department	Permit #: 012423	4/30/10	4/30/11	\$10	Flammable Materials	Potential Fire
Hazardous Waste Generator, Building I	US EPA	(Walbar, Inc.) ID # MAD001027838 310 CMR 30	1/10	1/11	\$525	Nickel Plating Oil changes	Waste management Potential spill
Hazardous Waste Generator, Building II	US EPA	(Walbar Metals) ID # MAD053464525 310 CMR 30	1/10	1/11	\$3420	Nitric acid Acetic acid Phosphoric acid Hydrochloric acid	Waste management Potential spill
NPDES Storm Water Permit, Building I	US EPA, Office of the NPDES	MAR05B112 MAR05CT05 (tracking)	1/5/09	1/5/13	NA	Metals, powders, acids, oils	Potential release
NPDES Storm Water Permit, Building II	US EPA, Office of the NPDES	MAR05B113 MAR05CT04 (tracking)	1/5/09	1/5/13	NA	Metals, powders, acids, oils, bases	Potential release
Sewer Connection Permit, Building I	MA Dept. of Environmental Protection P.O. Box 3584 Boston, MA 02241-3584	Customer # 1005615218000	1/07	No longer necessary per Jim Belsky at the Bureau of Waste Prevention, MADEP as of July 30, 2007.			

Permit Description	Governing Board	Identification #, Regulation #	Reg. Date	Exp. Date	Cost	Aspect	Impact
Sewer Connection Permit, Building II	MA Dept. of Environmental Protection, 10 Commerce Way Woburn, MA 01801 (617) 932-7600	No. 126513 / IWW No. N97CI011B BWP IW 34	7/09/07	No longer necessary per Jim Belsky at the Bureau of Waste Prevention, MADEP as of July 30, 2007.			
W.W.T.S. Plant Code (for operator license renewal only)	MA Dept. of Environmental Protection Board of Certification of WWTPO	1371-Chuck Edwards, Grade III, 12781-Steve Mahoney Grade IV 15258-Sean Lyons, Grade III	12/09	12/11	\$80 each	Industrial Wastewater	Untreated wastewater discharge to POTW
W.W.T.S. Staffing Plan	MA Dept of Environmental Protection Northeast Region	Staffing Plan submitted to MADEP under 314 CMR 12.00	6/16/09	6/16/11	N/A	Industrial Wastewater	Untreated wastewater discharge to POTW
Waste Water Discharge Permit, Metal Finishing Point Source Category, Subpart A-Metal Finishing Subcategory	South Essex Sewerage District 50 Fort Ave., P.O. Box 989, Salem, MA 01970 (978) 744-4550	40026 Coating Bldg. 41045 Repair Bldg.	12/18/10 12/17/09	12/18/12 12/17/11	N/A N/A	Acids, bases, metals	Potential Release
Toxic Use Reduction Fees "Form S"	DEP	ID # 131125	7/10	7/11	\$6825	Acids, bases, metals	Potential Release
Large Quantity Shipper Registration (Hazardous Materials)	Department of Transportation (DOT) PO Box 740188 Atlanta 30374-0188	Carriers USDOT #	June 1 st 2010	June 1 st 2013		Hazardous materials	Potential Release
TUR Planner (Steve Mahoney)	MA-DEP-TURA	Planner ID# 227226	4/05/11	4/05/13	\$250		

We defined our aspects and rated their significance using a tool that accounts for site vulnerability, activity analysis, inputs, and outputs.

Environmental Aspect Tool 007-WRK-02

Introduction and Instructions

Step 1 - Vulnerability Review

Step 2 - Initial Activity Sheet

Step 3 - Evaluate Each Operation

Step 4 - Transfer Scores to Results Sheet

Step 5 - Set Objectives for Improvement

Step 6 - Review (at least annually)

Microsoft Excel - Env Aspect Tool 007-WRK-01_Aerostructures Riverside April 2006.xls

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C39 fx

A	B	C	D
1		Environmental Aspect Analysis Tool	
2		GREHS-007-WRK-01	
3			
4		<u>Introduction</u>	
5			
6		This tool is provided to ensure a consistent approach to Goodrich sites conducting an environmental aspect and impact analysis as required by the Goodrich EHS Management System, (3.3).	
7		Further guidance in the use of this tool and on aspect analysis in general can be found in the document Aspect Analysis GREHS-001-FRM-001	
8			
9		Step 1 - Complete Site vulnerability review	
10		Step 2 - Complete the Initial Activity sheet to identify all operations that have an environmental aspect for each type of operation.	
11		Step 3 - Evaluate each operation for the significance of those aspects, using the scoring system given on the Rationale sheet and record on a Assessment of Environmental Aspect form. Add more forms if required.	
12		Step 4 - Sum up your aspects by transferring scores to Results Sheet with highest scores at the top in reducing aspect score order.	
13		Step 5 - Use these results to set objectives for improvement	
14		Step 6 - Review at least annually, and record review by putting name of reviewer and date of review on the bottom of each sheet.	
15			
16			
17		Additional Aspect Score sheets can be added as required using the "Move or copy sheet" facility under "Edit"	
18			
19			
20			
21			

Introduction Site Vulnerability Initial Activity Analysis Form Rationale Cutting

Ready

Section 1 – Site Vulnerability Review

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113

	A	B	C
1	Site Vulnerability Scores		
2			
3	Site: Aerostructures, Riverside CA		
4			
5	Vulnerability of Air		Scores
6	How close are the nearest nature reserves, sites of special interest, areas of outstanding natural beauty or agricultural land?	<200m - 10 200m - 500m - 8 500m - 1km - 6 1km - 5km - 4 >5 km - 2	4
7	What is the main surrounding land use?	Residential - 10 Agricultural/Forestry - 8 Greenfield - 6 Commercial - 4 Industrial - 2	10
8	Average Air score		7.0
9			
10	Vulnerability of Water		Scores
11	How close are the nearest nature reserves, sites of special interest, areas of outstanding natural beauty or agricultural land?	<200m - 10 200m - 500m - 8 500m - 1km - 6 1km - 5km - 4 >5 km - 2	4
12	How close are the nearest surface waters (river, stream, lake)?	<200m - 10 200m - 500m - 8 500m - 1km - 6 1km - 5km - 4 >5 km - 2	10
13	What is the classification of the nearest surface waters? (Based on UK surface and water classifications)	RE1: V good quality, suitable for all fish - 10 RE2: Good quality, suitable for all fish - 8 RE3: Fair, ok for high class coarse fish - 6 RE2: Fair, ok for coarse fish - 4 RE1: Poor, likely to limit coarse fish - 2	2
14	Average Water Score		5.3

Introduction Site Vulnerability Initial Activity Analysis Form Rationale Cutting edge Temp

- Score Air and Water according to column B

Average Scores from the Site Vulnerability Review are linked to Aspect Assessment worksheets

Site Vulnerability Review

Microsoft Excel - Env Aspect Tool 007-WRK-01_Aerostructures Riverside April 2008.xls		
File Edit View Insert Format Tools Data Window Help Adobe PDF		
A28 fx Scores assessed by:		
A	B	C
16	Vulnerability of Ground	Scores
17	How close are the nearest nature reserves, sites of special interest, areas of outstanding natural beauty or agricultural land? <200m - 10 200m - 500m - 8 500m - 1km - 6 1km - 5km - 4 >5 km - 2	4
18	What type of aquifer exists in this area? Major - no capping geology - 10 Major - with capping geology - 8 Minor - no capping geology - 6 Minor - with capping geology - 4 None - 2	10
19	How close is the nearest abstraction well? <200m - 10 200m - 500m - 8 500m - 1km - 6 1km - 5km - 4 >5 km - 2	2
20	What is the local groundwater used for? Drinking water - 10 Process water - 5 None - 2	2
21	What is the predominant geological construction of the area? Permeable e.g. Chalk/limestone - 10 8 Triassic Mudstone - 6 4 Impermeable e.g. Granite - 2	10
22	What is the predominant soil type in the area? Permeable e.g. Gravel - 10 8 6 4 Impermeable e.g. Clay - 2	10
23	Average Land Score	6.3
24		
25	Nuisance to Community	Score
26	What is the main surrounding land use? Residential - 10 Agricultural/Forestry - 8 Greenfield - 6 Commercial - 4 Industrial - 2	10

▪ Score Land and Nuisance to Community according to column B

= AVERAGE (C17:C23)

Site Vulnerability Review

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127 fx

	A	B	C
24			
25	Nuisance to Community		Score
26	What is the main surrounding land use?	Residential - 10 Agricultural/Forestry - 8 Greenfield - 6 Commercial - 4 Industrial - 2	
27	The Average Scores are rounded up and used in all aspects assessments		
28	Scores assessed by:	EHS Aspects & Impacts Event Team (A. Noble)	
29	Date:	4/7/2008	
30			
31	Site Vulnerability reviewed by	EHS Aspects & Impacts Event Team (A. Noble)	
32	Date	4/7/2008	
33	Changes made		
34	Site Vulnerability reviewed by		
35	Date		
36	Changes made		
37	Site Vulnerability reviewed by		
38	Date		
39	Changes made		

- Enter name(s) of assessor(s) and date

✓ **Site Vulnerability Review COMPLETE!**

Initial Activity Analysis

Complete by Operation, Process, Activity, etc.

Initial Analysis Activity

SBU

Aerostructures

Date

4/7/2008

Consider Normal / Abnormal / Emergency Operating Conditions

Use the Initial Activity Analysis Form to guide completion of the Aspect Assessment Worksheets

6	TEAM	Activity, Process Step or Department	Operating conditions			Inputs			Outputs			Other Factors						Protective Procedures	Significance Total	Applicable Legislation		
			Normal	Abnormal	Emergency	Electrical Power	Gas/Fuel/Oil	Raw Material/Asstg/Materials	Water	Air emissions	Waste water	Waste heat	Waste (Spent)	Waste (Covered/Package)	Waste (Internal)	Waste (External)	Visual Appearance (Internal)				Visual Appearance (External)	Handouse Substrate
7	D	BOILER OPS	X			X		X	X	X	X		X	X	X	X	X	X	X	24/7 operator on-duty; automated pressure-relief systems; TPM program	208	
8				X			X		X	X	X		X	X	X	X	X	X	X		208	
9						X			X	X	X		X	X	X	X	X	X	X	X		0
10	D	AUTOClave OPS	X			X	X	X	X	X	X		X			X	X	X	X	Multiple pressure-relief systems; calibrated blow-out disc	119	
11				X			X	X	X	X		X				X	X	X	X		119	
12					X			X		X	X		X			X	X	X	X		0	
13	D	VACUUM SYSTEM	X			X			X	X		X		X			X	X	X		168	
14				X			X		X	X		X		X			X	X	X		224	
15					X			X		X	X		X			X	X	X	X		0	
16	D	PROCESS LINES	X			X	X	X	X	X	X		X	X	X	X	X	X	X	Closed loop water recycling		
17				X			X	X	X	X	X		X	X	X	X	X	X	X			
18					X			X	X	X	X		X	X	X	X	X	X	X			
19	D	PROCESS LINES TANK CLEANOUT	X			X	X	X	X	X	X		X			X	X	X	X			
20				X			X	X	X	X		X			X	X	X	X	X			
21					X			X		X	X		X			X	X	X	X			
22	C	SPRAY COATING	X			X	X	X	X	X	X		X	X	X	X	X	X	X			
23				X			X	X	X	X		X		X	X	X	X	X	X			
24					X			X		X	X		X			X	X	X	X			
25	A	CUTTING EDGE	X			X	X				X	X				X	X	X	X			
26				X			X	X			X	X				X	X	X	X			
27					X			X				X	X			X	X	X	X			
28	C	DEFREASER	X			X	X	X	X	X	X		X			X	X	X	X	Continuous electronic monitoring		
29				X			X	X	X	X		X			X	X	X	X	X			
30					X			X		X	X		X			X	X	X	X			

✓ Initial Activity Analysis COMPLETE!

Aspect Assessment Worksheets

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B41 =IF(B16>0,ROUND(Site Vulnerability1\$C\$14,0),0)

Assessment of Environmental Aspects				
GOODRICH		Aerostructures, Riverside CA		
Ref No:- AEA7				
Area:- Process:		NPT Abrasive Blasting		
Activity:-				
Assessment Criteria for Site Aspects	Operating Condition			Environmental Risk Scoring Key
	Normal	Abnormal	Emergency	High, 2 = Medium 1 = Low Use scoring system in Rationale
ASPECTS	Normal	Abnormal	Emergency	Comments
Inputs				
Electrical Power	1	1	0	
Gas/Fuel Oil	0	0	0	
Water	0	0	0	
Raw Materials/Auxiliary Materials	2	2	0	
Outputs				
Air Emission	1	1	0	
Waste Water	0	0	0	
Waste Heat	0	0	0	
Waste - Special (liquid/solid)	1	1	0	
Waste (general/packaging/swarf)	1	1	0	
Noise (Internal)	2	2	0	
Noise (External)	0	0	0	
Visual Appearance (Internal)	2	2	0	Storm water; media visible on the ground
Visual Appearance (External)	0	0	0	
WEIGHTING FACTORS	Normal	Abnormal	Emergency	Comments
Controls				
Are Controls adequate for usage?	2	2	0	Storm water; media visible on the ground
Hazard				
Hazardous Substances Actual/Potential Contamination	0	0	0	
Actual/Potential Contamination	1	1	0	Storm water; media visible on the ground
HS&E Incidents				
Environmental incidents since last assessment			0	
Injury records since last assessment			1	
Business Concerns				
Potential cost of incident			1	
Legal non-compliance			0	
Stakeholders				
Interested Party Concern	n	n	n	

Ready

- Consistency in evaluation and scoring each process using the Rationale Sheet ensures that the most significant processes have the highest Significance Total scores

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Assessment of Environmental Aspects				
GOODRICH		Rationale		
ASPECTS	HIGH	MEDIUM	LOW	N/A
Inputs	3	2	1	0
Electrical Power	High consumption or equipment left switched on with low usage	Medium consumption or equipment requires warm-up before use	Low consumption or equipment switched on only when required	Not used
Gas/Fuel Oil	High consumption or equipment left switched on with low usage	Medium consumption or equipment requires warm-up before use	Low consumption or equipment switched on only when required	Not used
Water	High consumption or continuous uncirculated use	Medium consumption or partial recirculation/controlled use	Low consumption or fully recirculated system	Not used
Raw Materials/ Auxiliary Materials	High consumption of raw material - poor material utilisation	Significant consumption of raw material - partially optimised	Low consumption of raw materials - optimised usage	Not used
Outputs				
Air Emission (consent to discharge)	Untreated air emissions, including dust and odour, that require monitoring and/or reporting to external agency	Untreated air emissions, including dust and odour, that require monitoring and/or reporting to external agency	Air emissions, including dust and odour, after partial treatment, or untreated contaminated air emissions that do not require reporting	Clean air emission or N/A
Waste Water to drainage system (consent to discharge)	Contaminated or heated water, direct to external drain	Contaminated or heated water, discharged after partial treatment	Contaminated or heated water, discharged after full treatment or non-hazardous contain/inhalation	Clean water discharge or N/A
Waste Heat	High waste heat, no re-use	Significant waste heat - partial re-use	Waste heat re-used or low waste heat	No waste heat
Waste - Special (solid/liquid)	Disposal/landfill - without volume reduction, no recycling	Disposal/landfill - with reduced volumes, or partial recycling	Full segregation and recycling	None
Waste (General/packaging/swarf)	Disposal/landfill - without segregation, compaction or recycling	Disposal/landfill - with partial segregation/compaction/recycling	Full segregation and recycling	None
aspects (cont)	3 = High	2 = Medium	1 = Low	0
Noise (Internal)	Workplace sound level > 85dB(A) Leq 8hrs, i.e. speech not possible	Workplace sound level 80-85dB(A) Leq 8hrs, i.e. raised voice levels required for speech	Workplace sound level < 80 dB(A) Leq 8 hrs, i.e. normal speech level possible	No noise
Noise (External)	Noise emission at site boundary likely to cause complaint	Noise emission at site boundary may cause complaint	Noise emission at site boundary unlikely to cause complaint	No noise
Visual Appearance	Clearly observable visual	Observable visual emissions,	Low observable visual emissions,	N/A

Ready

- When scoring Outputs, consider each potential aspect and impact to air, water, and land

- Example: NPT Abrasive Blasting uses aluminum oxide grit blast media

- Air emissions
- Stormwater impacts
- Hazardous waste
- Recycle

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B41 =IF(B16>0,ROUND(Site Vulnerability1\$C\$14,0),0)

Assessment of Environmental Aspects				
GOODRICH		Aerostructures, Riverside CA		
Ref No:- AEA7				
Area- Process: NPT Abrasive Blasting				
Activity:-				
Assessment Criteria for Site Aspects	Operating Condition			Environmental Risk Scoring Key
	Normal	Abnormal	Emergency	High, Medium, Low Use scoring system in Rationale
ASPECTS	Normal	Abnormal	Emergency	Comments
Inputs				
Electrical Power	1	1	0	
Gas/Fuel Oil	0	0	0	
Water	0	0	0	
Raw Materials/Auxiliary Materials	2	2	0	
Outputs				
Air Emission	1	1	0	
Waste Water	0	0	0	
Waste Heat	0	0	0	
Waste - Special (liquid/solid)	1	1	0	
Waste (general/packaging/swarf)	1	1	0	
Noise (Internal)	2	2	0	
Noise (External)	0	0	0	
Visual Appearance (Internal)	2	2	0	Storm water; media visible on the ground
Visual Appearance (External)	0	0	0	
WEIGHTING FACTORS	Normal	Abnormal	Emergency	Comments
Controls				
Are Controls adequate for usage?	2	2	0	Storm water; media visible on the ground
Hazard				
Hazardous Substances Actual/Potential Contamination	1	1	0	Storm water; media visible on the ground
HS&E Incidents				
Environmental incidents since last assessment			0	
Injury records since last assessment			1	
Business Concerns				
Potential cost of incident			1	
Legal non-compliance			0	
Stakeholders				
Interested Party Concern	n	n	n	

Ready

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G2 =IF(B16>0,ROUND(Site Vulnerability1\$C\$14,0),0)

Assessment of Environmental Aspects				
GOODRICH		Rationale		
ASPECTS	HIGH	MEDIUM	LOW	N/A
Inputs	3	2	1	0
Electrical Power	High consumption or equipment left switched on with low usage	Medium consumption or equipment requires warm-up before use	Low consumption or equipment switched on only when required	Not used
Gas/Fuel Oil	High consumption or equipment left switched on with low usage	Medium consumption or equipment requires warm-up	Low consumption or equipment switched on only when required	Not used
Water	High consumption or continuous uncirculated use	Medium consumption or partial recirculation/controlled use	Low consumption or fully recirculated system	Not used
Raw Materials/ Auxiliary Materials	High consumption of raw material - poor material utilisation	Significant consumption of raw material - partially optimised	Low consumption of raw materials - optimised usage	Not used
Outputs				
Air Emission (consent to discharge)	Untreated air emissions, including dust and odour, that require monitoring and/or reporting to external agency	Untreated air emissions, including dust and odour, that require monitoring and/or reporting to external agency	Air emissions, including dust and odour, after partial treatment, or untreated contaminated air emissions that do not require reporting	Clean air emission or N/A
Waste Water to drainage system (consent to discharge)	Contaminated or heated water, direct to external drain	Contaminated or heated water, discharged after partial treatment	Contaminated or heated water, discharged after full treatment or non-hazardous contain/inflation	Clean water discharge or N/A
Waste Heat	High waste heat, no re-use	Significant waste heat - partial re-use	Waste heat re-used or low waste heat	No waste heat
Waste - Special (solid/liquid)	Disposal/landfill - without volume reduction, no recycling	Disposal/landfill - with reduced volumes, or partial recycling	Full segregation and recycling	None
Waste (General/packaging/swarf)	Disposal/landfill - without segregation, compaction or recycling	Disposal/landfill - with partial segregation/compaction/recycling	Full segregation and recycling	None
aspects (cont)	3 = High	2 = Medium	1 = Low	0
Noise (Internal)	Workplace sound level > 85dB(A) Leq 8hrs, i.e. speech not possible	Workplace sound level 80-85dB(A) Leq 8 hrs, i.e. raised voice levels required for speech	Workplace sound level < 80 dB(A) Leq 8 hrs, i.e. normal speech level possible	No noise
Noise (External)	Noise emission at site boundary likely to cause complaint	Noise emission at site boundary may cause complaint	Noise emission at site boundary unlikely to cause complaint	No noise
Visual Appearance	Clearly observable visual	Observable visual emissions,	Low observable visual emissions,	N/A

Ready

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	A	B	C	D	E
25	WEIGHTING FACTORS	Normal	Abnormal	Emergency	Comments
26	Controls				
27	Are Controls adequate for usage?	2	2	0	Storm water; media visible on the ground
28	Hazard				
29	Hazardous Substances	0	0	0	
30	Actual/Potential Contamination	1	1	0	Storm water; media visible on the ground
31	HS&E Incidents				
32	Environmental incidents since last assessment			0	
33	Injury records since last assessment			1	
34	Business Concerns				
35	Potential cost of incident			1	
36	Legal non compliance			0	
37	Stakeholders				
38	Interested Party Concern	0	0	0	
39	Regulatory Requirements				
40	SITE VULNERABILITY				
41	Vulnerability of Air	7	7	0	
42	Vulnerability of Water	0	0	0	
43	Vulnerability of Ground	6	6	0	
44	Nuisance to Community	0	0	0	
45	Aspect Total	10	10	0	
46	Weighting Factor Total	3	3	2	
47	Vulnerability Total	13	13	0	
48	Significance Total	390	390	0	
49	Additional Comments (including details of Abnormal and Emergency Conditions)				
50					
51					
52					
53					
54	Assessment By:	A. Noble	Date:	4/9/08	
55	EHS Aspects & Impacts Event Team A				

- Output scores are related to Site Vulnerability
- Scores for specific Output category come from the Site Vulnerability sheet

Results Sheet

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A6 =Cutting edge\ES

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	SBU		Aerostructur	Site			Aerostructures, Riv									
3	Ref	Area Process	Activity	High Score			Normal Cond									
4							Inputs					Outputs				
5				Normal	Abnormal	Emergency	Electrical Power	Gas / Fuel Oil	Water	Raw Materials	Air Emissions	Waste Water	Waste Heat	Waste - Special	Waste - General	Noise - Internal
30	AEA25	Flow Control		312	312	195	1	1	0	1	1	0	1	1	0	0
31	AEA26	Hang		6	6	0	0	0	0	0	0	0	0	0	0	0
32	AEA27	Mechanical Assembly		416	416	0	1	1	0	1	0	0	0	0	0	0
33	AEA28	Boiler Operations		208	208	0	2	3	1	0	0	0	0	0	0	0
34	AEA29	Autoclave Operations		119	119	0	0	0	1	0	0	0	0	0	0	0
35	AEA30	Vacuum System		168	224	0	3	0	1	0	1	0	0	0	0	0
				252	280	210	3	0	1	1	1	0	0	0	0	0
				440	440	0	1	1	2	0	0	3	0	3	0	0
				60	60	0	1	0	0	0	0	0	0	1	1	0
				72	72	0	1	1	1	1	1	0	0	0	0	0
				264	264	0	2	0	1	2	0	1	0	0	2	0
41	AEA36	Oven Use / Cure		63	126	0	3	2	0	0	2	0	2	0	0	0
42	AEA37	Groundwater Monitoring/Barrier Treatment Syst		72	72	0	1	0	0	1	0	0	0	0	0	0
43				Totals for operation by Condition												
44				55	17	18	36	31	12	15	41	19	34	2	23	2
45				Overall significant Aspects												
46				112	35	36	74	65	24	30	85	39	63	4	47	4
47				Ranking												
48				1	12	11	5	7	14	13	3	10	6	16	9	17
49				2	4	8	18	15								
50																
51																
52																
53																
54																
14				Oven Ops	Groundwater Monitoring_Barrier	Results Sheet	Significance Ranking	Revision								

- Manually enter links to transfer scores from Assessment worksheets to Results worksheet

- Example:
 - Boiler Operations, Electrical Power

=Boiler Ops!\$B\$10
Electrical Power

=SUM(G6:G42)
Total of All Processes' Scores for Electrical Power

=G43+Y43
Total of Scores for Normal + Abnormal Conditions for Electrical Power

Enter Rankings
Highest Score = 1

✓ Results Sheet COMPLETE!

Set Objectives for Improvement and Review Annually

Process	Actual	Target	Other	Y1	Y2	Y3	Y4	Y5	Notes	Improvement Objectives	Progress to Date of 11-28-08	
HIGH: 1. De-Iso	466	466	0	3	3	0			Adequacy of Controls	No controls on de-iso process at T81 Bldg 41. As of 8-11-08 the grind booth is too low to do all necessary tasks inside the booth. 55-10% of the time workers have had to do tasks outside of the booth due to workers occupying the booth.	Check status of CWest fish booth ventilation project	
2. Bar, Off Draw	1150	1150	0	2	2	0			Adequacy of Controls	Uncovered toxic air emissions and substance odor; possible hazardous waste	Check SCAQMD permitting status on control equip alternative. Conduct assessment of bar/off process. Control CHRM Mill for control and permitting violation.	
3. NPT Abrasive Blasting	330	330	0	2	2	0			Adequacy of Controls	Aluminum oxide blast media visible on ground	Ensure proper operation of NPT and particulate control equipment, housekeeping (exterior sweeping). Verify PMS on B15, NPT, and B41/NPT.	
4. Core expanded and cut	168	168	0	2	2	0			Adequacy of Controls	Aluminum core scrap debris and particles visible on ground	Ensure proper scrap and debris segregation and collection; ensure proper operation of particulate control equipment, housekeeping (exterior sweeping). Verify PMS on B4 dust collectors and sweeping schedule to control aluminum.	
5. Spray Coating Operations	1008	1260	0	1	1	0			Hazardous Substances; Waste-Special; Environmental Incidents	Hazardous materials in coatings; hazardous waste; recurring environmental incidents	Check status on electronic environmental monitoring system installation project (electronic differential pressure monitoring on B spray booth). Verify PMS on all spray booths.	
6. Process Water Recycling	984	984	0	1	1	1			Hazardous Substances	Hazardous materials in process line solutions	Evaluate secondary containment in process water recycling equipment area	
7. Haz Waste Handling and Storage	732	1635	3310	1	1	1			Waste-Special; Waste (general/packaging); Actual/Potential Contamination; Potential Cost of Incident	Hazardous waste; non-recycled packaging; potential contamination; potential cost of incident	Check status of waste minimization projects. Explore further hazardous waste reduction possibilities.	
8. Facility Maintenance	702	1224	3060	1	1	1			Inputs, Outputs, Other Factors under Emergency Conditions	Energy efficiency, emergency response, and waste minimization improvements as possible	Check status of Facility Engineering Energy Efficiency project; explore further TPM, recycling and waste minimization possibilities.	
9. EMA Seal Application	520	520	210	1	1	1			Electrical Power; Hazardous Substances; Waste-Special; Visual Appearance (odor)	Temperature and humidity control; hazardous materials; hazardous waste; odors and humidity.	Further assess process details.	
10. Process Lines Tank Clean Out	440	440	0	1	1	2			Adequacy of Controls; Waste-Special	Hoses used during tank cleanouts can present potential spill and trip hazards	Ensure process line tank cleanouts scheduled during appropriate hours to minimize potential odors. Verify OSHA written procedures require standard work.	
11. Mechanical Assembly	416	416	0	1	1	0						
12. Debug, tool clean	416	416	0	1	1	1						
13. Shipping & Receiving	330	330	0	1	1	1						
14. Vehicle Ops	351	351	0	1	1	0						

Location	Activity, Product, Service	Aspect	Impact	Engineering Controls	Legal	Significance	Total
				Systems	Requirement	Ranking	
Strip and Recoat	Material Removal, Acid Stripping, Acid Storage	Acids, Bases	Air emission, potential spill	Secondary Containment, Controlled Inventory	310 CMR 7.00, 310 CMR 30, 49CFR 132	1	9450
Powder Pack / Unpack		Metals, powders	Potential Release	Extraction, Recycle	310 CMR 7.00, 40 CFR 122	2	8750
Heat Treat - Coating	Metal Coating	Chromium	Potential Release	Extraction, Recycle	40 CFR 433 subpart A, SESD SUR Rev. 11-03	3	8675
	Hydrogen Gas Use	Hydrogen use	Potential Explosive	Furnace Systems	Peabody FD		
	Natural Gas Use	Gas use	Air Emissions	Furnace Systems	310 CMR 7.00		
	Argon Gas Use			Furnace Systems	522 CMR 17		
	Coating	Electricity	indirect emissions				
FIC/CVD	Metal Coating	Hydrogen Chloride	Potential Release	Cabinets vented to Scrubber	6 CFR 27	4	8450
	Metal Cleaning	Hydrogen Fluoride	Potential Release	Cabinets vented to Scrubber	6 CFR 27		
Plating	Electrolytic Platinum Plating	Plating Solution, Solvents	Potential Release	Extraction to Scrubber	40 CFR 433 subpart A, SESD SUR Rev. 11-03	5	5025
Waste Water	Nickel and Chromium Removal, pH Adjustment	Metals, powders	Potential Release	Batch system	40 CFR 433 subpart A, SESD SUR Rev. 11-03	6	3168
Powder Mix	Mixing alloy powders for heat treat processes	Metals, powders	Potential Release	Extraction	310 CMR 7.00, 40 CFR 122	7	2000
	Powder Storage	Metals, powders	Potential Release	Dehumidifiers	310 CMR 7.00		

Location	Activity, Product, Service	Aspect	Impact	Engineering Controls	Legal	Significance
				Systems	Requirement	Ranking
Vane Segment Cell	EDM, grinding	Oils, Coolants	Potential Spill	Secondary Containment	40 CFR 112	8
	Benching	Metals	Potential Release	Extraction	310 CMR 7.00	
Vane Ring Cell	Welding	Metals	Air Emission	Extraction	310 CMR 7.00	12
	Grit Blasting	Grit Blast Media	Potential Release	Recycle Program		
Large Engine Cell	Degreasing, Cleaning	Solvents	Potential Release	Oil/Water Separators	40 CFR 433 subpart A, SESD SUR Rev. 11-03	14
Braze	Brazing, cutting, spot welding, nickel plating	Plating Solution	Potential Spill	Secondary Containment	49 CFR 172, 310 CMR 30	9
	Grit Blasting, pasting	Grit Blast, nickel	Potential Release			
FPI Repair FPI Coating	Fluorescent Penetrant Inspection	Penetrants	Potential Release		40 CFR 433 subpart A, SESD SUR Rev. 11-03	10
		Penetrants	Potential Release			15
Maintenance	Grind, Weld, Degreasing, Air Flow, Blasting	Oils, Oily Solids, Solvent	Potential Spill		40 CFR 112	11
	Universal Waste Handling	Wastes	Potential Release		310 CMR30.143, .1000 & .1038	
Heat Treat - Repair	Argon Gas Use			Furnace Systems	522 CMR 17	13
	Coating	electricity	indirect emissions			
Coating	Masking	Powder, Nickel	Potential Release			16
180 day storage area	Storage of Hazardous and non-hazardous wastes	Acid, Oils, Coolants	Potential Spill		310 CMR 30, 49 CFR 172	17
90 Day Storage Area	Storage of Hazardous and non-hazardous wastes	Acids, Oils, Bases	Potential Spill		310 CMR 30, 49 CFR 172	18
Shipping and Receiving	Shipping/receiving of product and raw materials.	Raw materials	Potential Release			19
X-Ray NDT	Non- Destructive Testing	Film	Potential Release	Lead Foil, Film Collection		20

Significant Aspects become Objectives and Targets

- ◆ Some significant aspects have already reached Best Available Control Technology.
- ◆ These aspects should still be listed to show that they were considered during management review

Successful Objectives and Targets

- ◆ Electricity Reduction
- ◆ Hazardous Chemical Inventory Reductions
- ◆ Pulse Plating of Nickel Compounds
- ◆ Natural Gas Reduction

Electricity Reduction as an Objective with 5% target

- ◆ Our electricity consumption in 2007 was 5,975,200 Kilowatt hours.
- ◆ We installed variable frequency drive air compressors in our two main buildings.
- ◆ At the same production output our consumption dropped to 5,592,800 Kilowatt hours.
- ◆ Savings = 382,400 KWHr = \$45,900 at 0.12/KWHr

Electricity Reduction as an Objective with 2% target

- ◆ Since 2008 we installed variable speed drives on several motors from 10 to 40 horsepower
- ◆ We also installed T8 - 28W lamps to replace 32W lamps
- ◆ The added reductions resulted in a savings of 349,200 KWHr
- ◆ Total reduction from 2007 has been 731,600 KWHr or 12.2%

Not So Successful Objectives and Targets

- ◆ Nitric Acid Reduction
- ◆ Solid Waste Reduction

Nitric Acid Reduction

- ◆ Filters were installed in all nitric acid tanks - acid longevity was unaffected
- ◆ Additives to increase acid longevity were used –Our customers would not grant approval to use them
- ◆ An acid recovery system using diffusion dialyses was purchased

Reduce nitric acid use in stripping operations.

Improvement Target

Achieve a 5% reduction from 2009 total.

No.	Plan (Macro-Plan)	Do (Major elements of Plan)	Check	% Comp	Act (Details of 3-month rolling plan)	Assigned
1	Reduce nitric acid usage in stripping operations. Implementation target date 5/7/10.	Achieve a 5% reduction from 2009 usage.	◆	100%	Source a nitric condusive filtration unit that will reclaim spent material and not impact quality standards. Aqualogic Acid Recovery System .	Mahoney
2	Reduce nitric acid usage in stripping operations. Implementation target date 5/7/10.	Evaluate past annual consumption levels and compare to post filtration implementation levels.	◆	100%	Drawings developed and reviewed, materials purchased and received, installation completed.	Mahoney, Lyons, Ciarcia
3	Phase in utilization of Nitric filtration system.	Design and install machanical system between filter and chemical tanks.	◆	100%	Drawings developed and reviewed, materials purchased and received, installation completed.	Mahoney, Maintenance Team
4	Phase in utilization of Nitric filtration system.	Test run the system. Schedule for WE 4/4/10.	◆	100%	System will be connected to waste stream and output will be evaluated on scrap material. First drums of test material are available as of 4/16/10.	Mahoney, Maintenance Team, Ciarcia, Chemical Operators, Engineering
5	Phase in utilization of Nitric filtration system.	Revise ESP 4.4.6-11 Strip & Recoat Nitric Acid Filtration	❖☒	100%	ESP currently covers previously utilized filters, revision will preceed use of the reclaimed material for production. As of 12/13/2010 filters are no longer utilized. Procedure ESP 4.4.6-11 is now obsolete.	Mahoney, Lyons
6	Increase specific gravity of the reclaimed acid.	Run the feed pump at a slower input speed	❖☒	100%	3 drums of reclaim were produced with increasing specific gravity. When 1.4 or above is achieved, the reclaim will be recycled into the C6 tanks. Target date is 7/16/2010. As of 12/13/2010 1.4 spec. gravity acid has yet to be achieved after numerous attempts.	Mahoney, Ciarcia
	Add up to 15% to new batches	Fill holding tank for nitric acid	❖☒	100%	Holding tank and feed lines have leaks that must be repaired. A cone bottom tank will be purchased by 11/12/2010. Since the correct spec. gravity acid is unattainable, the cone bottomed tank will not be needed.	Mahoney, Ciarcia

Nitric Acid Recovery

- ◆ Diffusion Dialyses works
- ◆ However, the acid is reduced in strength from 70% to about 45%
- ◆ Nitric acid forms an azeotrope with water.
- ◆ It boils with water at 82 to 122 degrees C depending on the percentage of nitric acid in solution

Nitric Acid Recovery

- ◆ We could not boil the solution to increase concentration
- ◆ We learned that reducing our acid bath temperature reduces our nitric acid loss to the scrubbing system.

Examples of Operational Controls

- ◆ ESP 4.4.6
- ◆ Operational Control Procedure describing the operational created to manage EC Peabody's identified significant environmental aspects. 1/5/2010
- ◆ ESP 4.4.6-01
- ◆ Hazardous and Non-Hazardous Waste Management Program Procedure to define the management of hazardous and non-hazardous waste at EC Peabody. 9/15/2009
- ◆ ESP 4.4.6-02
- ◆ Recycle and Reuse Program Outlines the Recycle and Reuse Program as implemented. 1/11/2010
- ◆ ESP 4.4.6-02 Appendix 1
- ◆ Recycle Vendor List List of vendors used in the recycle and reuse operational control. 1/5/2010
- ◆ ESP 4.4.6-03
- ◆ Universal Waste Program This procedure defines the methods for handling universal waste generated at ECD Peabody. 4/23/2010
- ◆ ESP 4.4.6-04
- ◆ Waste Handling Describes how to handle waste produced at TCS. 1/23/2006
- ◆ ESP 4.4.6-05
- ◆ Recycle Handling Defines procedures for handling recyclable materials. 10/28/2010
- ◆ ESP 4.4.6-06
- ◆ FIC/CVD Scrubber Waste handling Describes how an operator transfers the scrubber waste to waste water for processing 1/11/2010
- ◆ ESP 4.4.6-07
- ◆ Extractor Waste Handling Describes the process to be used when handling waste from extractor units used by Engine Components Peabody. 5/27/2010
- ◆ ESP 4.4.6-08
- ◆ HCL and HF Cylinder Handling This procedure is for the proper handling of cylinders that contain HCl and HF gases used in the FIC/CVD processes. 7/20/2010
- ◆ ESP 4.4.6-09
- ◆ Strip & Recoat Chemical Handling Procedure to properly store and handle hazardous materials used in the Chemical Room of the Strip and Recoat Cell. 6/18/2008
- ◆ ESP 4.4.6-09 Appendix 1
- ◆ Strip and Recoat Chemical Management Strip and Recoat Cell guides to properly handle hazardous materials. 6/18/2008
- ◆ ESP 4.4.6-10
- ◆ Acid Fume Scrubber Maintenance Procedure to ensure proper operation of the acid fume scrubber located on the roof of 8 Fifth Street. 6/1/2010
- ◆ ESP 4.4.6-11
- ◆ Strip & Recoat Nitric Acid Filtration Procedure describing how to operate nitric acid filtration equipment installed in the Strip and Recoat Cell. 6/18/2008
- ◆ ESP 4.4.6-12
- ◆ Chemical Management Program This procedure outlines the requirements for ordering and receiving chemical at TCS. 7/20/2010
- ◆ ESP 4.4.6-12 Appendix 1
- ◆ Approved Chemicals List This is the approved chemicals list for Engine Components - Peabody 1/7/2010
- ◆ ESP 4.4.6-13
- ◆ Contractor Management Operational control defining the management of contractors on site at Engine Components Peabody. 7/24/2009

Operational Control

- ◆ The operational control procedures are the heart of any EMS
- ◆ They define the system that a company is using to control its operations
- ◆ The employees in the company are directly responsible for these operations. Given the proper instructions, the employees do a great job following and improving the environmental procedures

Management Review

- A good internal audit leads to a good Management Review
- A good Management Review proves that your system is implemented and maintained.
- So,.....
- Who's going to answer the 199 questions to complete your internal audit?

