

International E-Waste Management Network (IEMN)

Hanoi, Vietnam

14 - 17 July 2014



A Closer Look At EHS Management Systems

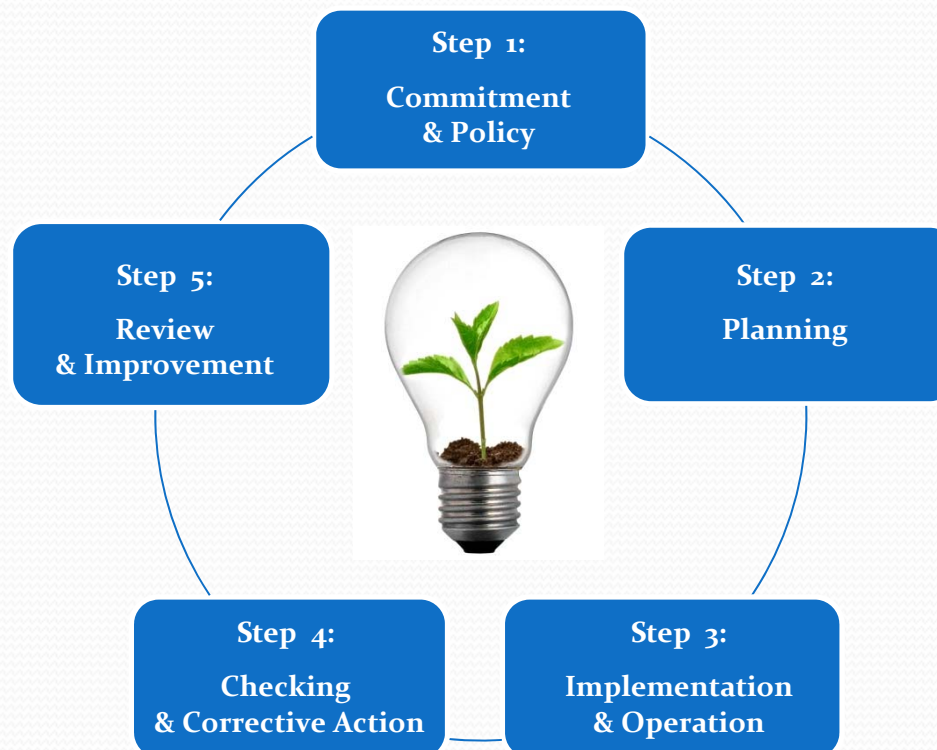
(based on NAFTA CEC training modules)

Michael VanderPol
Environment Canada

EHS Management Systems



- Systematic approach to integrate environmental, health & safety considerations into day-to-day activities of an organization



EHS management systems provide several benefits

- ✓ Enhance risk management & environmental protection
- ✓ Improve worker safety & reduce worker illness & injury
- ✓ Demonstrate commitment to EHS
- ✓ Improve relations with workers, business partners, regulators & public
- ✓ Use as marketing tool to distinguish oneself from competitors
- ✓ Increase business & economic opportunities
- ✓ Increase operational efficiencies & reduce costs
- ✓ Assure legal compliance & demonstrate due diligence
- ✓ Promote continual improvement





Comprehensive EHS management systems prevent undesirable situations



**THIS DEPARTMENT
HAS WORKED**

12 DAYS

**WITHOUT A LOST
TIME ACCIDENT
THE PREVIOUS
RECORD WAS**

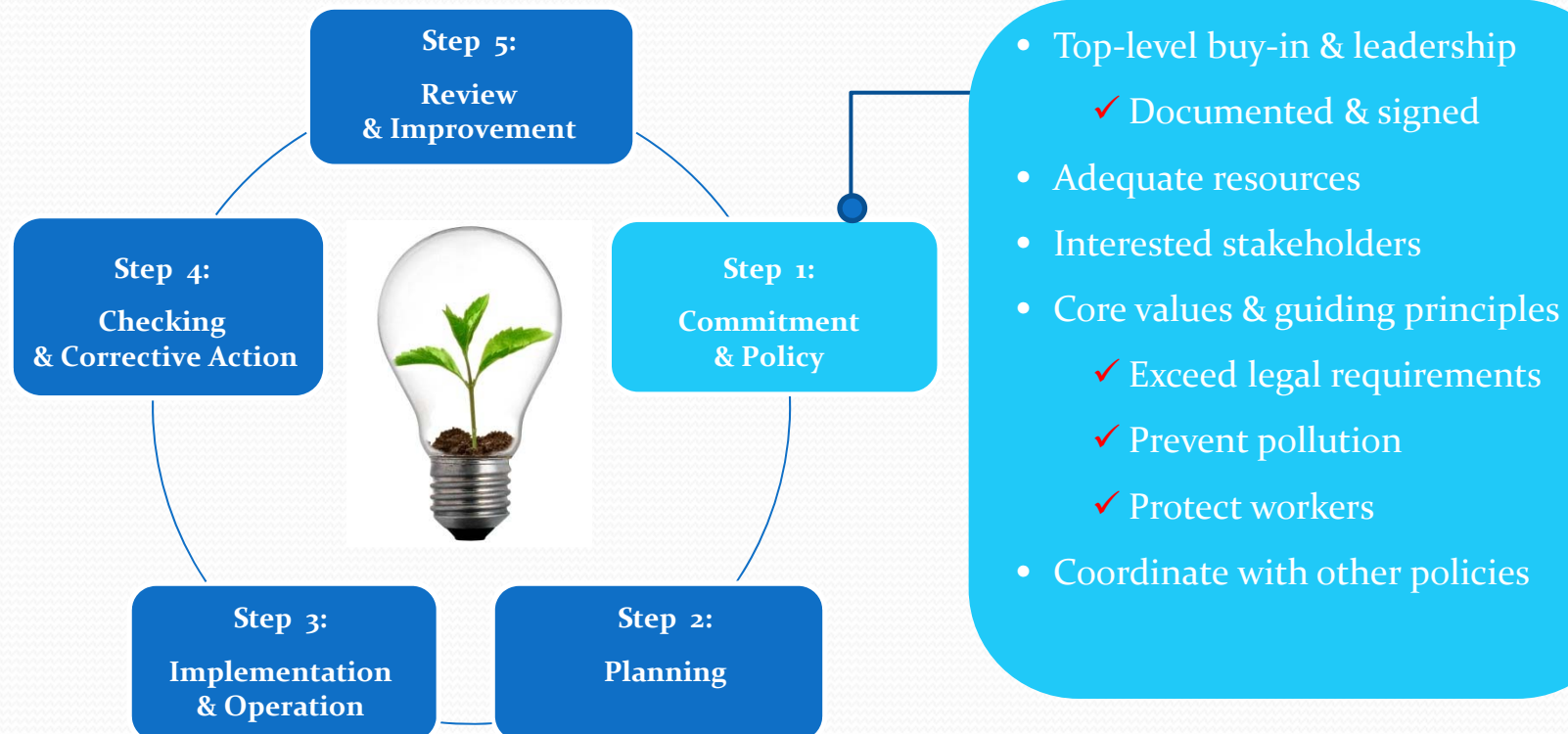
14 DAYS

*Let's work together
to set a new record !*

Commitment & Policy:

If you don't know where you are going, any road will get you there

- Top-down commitment is essential for ESM to become a reality
- Policy identifies goals against which all future actions will be judged



Secure top-level buy-in first

Best practice

Example

- Identify a champion
- “Sell” the benefits to top management
- Explain what an EHS management system entails
- Seek adequate resources (human, physical, financial)
- Clarify authorities
- Get a clear commitment to proceed in writing
- Communicate commitment throughout organization
- Regularly update top management on progress





Best practice

Example

Courtesy of CDI Computer Dealers Inc.

March 1st, 2010

Dear Naipaul,

As discussed I am entrusting in you the overall responsibility for our ISO9001 and ISO14001 certification process:

You will have full authority to move this project forward as well as the responsibility to:

- a) ensure that processes needed for the QMS are established, implemented and maintained,
- b) report to top management on the performance of the QMS and any need for improvement, and
- c) ensuring the promotion of awareness of customer requirements throughout the organization.
- d) Liaising with external parties on matters relating to the QMS.

I expect you to pull in any and all members of our management team and the rest of the team as you see necessary.

I would expect and appreciate periodic (monthly at a minimum) updated on the process and I am at your service for anything and everything you need to get this project done.

This letter addresses quality management & environmental management.

EHS management systems also include health & safety management.

Examples include:

- CSA Z1000
- OHSAS 18001
- ILO-OHS 2001
- ANSI-AIHA Z10
- others

This is a publicly available example. Use does not imply company endorsement.

A good EHS Policy is key to success

Best practice

Example

- Tailor to organization (versus copy from elsewhere)
- Involve management & employees in its preparation
- Document & have signed by top-level management
- Communicate policy to all employees
- Model behaviour based on commitments
- Avoid being overly specific (interpreted as legalistic)
- Make policy available to the public
- Periodically review policy



Organizations benefit from clear values to define itself & guide behaviour

Best practice

Example

EHS policy commitments may include:

- ✓ Meet or exceed legal & other requirements
- ✓ Safeguard health & safety of workers & communities
- ✓ Protect environment
- ✓ Set an example of industry leadership for EHS
- ✓ Strive towards zero waste to landfill & zero pollution
- ✓ Maximize recovery of natural resources
- ✓ Continual improvement





ENVIRONMENTAL HEALTH AND SAFETY POLICY

Sims Recycling Solutions is committed to the goals of sustainable development. We balance social, environmental and economic considerations in how we manage our business. We are committed to the principles of protecting workers' basic human rights, accountability of our materials and by-products to final disposition, prohibition of prison labor use and exports that violate the Basel Convention.

Management has prime responsibility for managing environment, health and safety. Supervisors are responsible for ensuring a healthy and safe working environment for employees under their direction. All employees are responsible for working safely and in compliance with the law and all Sims Recycling Solutions requirements.

To implement this policy and its commitments, Sims Recycling Solutions will:

STRIVE to be leaders in environment, health and safety management by minimizing our impact on and risks to our employees, the public, our communities, our customers and the natural environment, throughout all stages of our business activities.

MEET or surpass applicable environmental, health, hygiene, safety, emergency preparedness and response legislation, and other requirements to which the company subscribes.

ESTABLISH clear and meaningful objectives and targets for environment, safety and health management activities.

IMPLEMENT management systems to address risks, pollution prevention, and environment, health and energy efficiency and perform regular audits to ensure continuous improvement.

FACILITATE dialogue with external parties in order to anticipate and address relevant issues of sustainability.

MAINTAIN and promote stewardship, reuse, recycling and waste minimization programs to benefit and protect employees, the public, customers and the environment.

ENSURE that improvements in safety, health, and well-being of all employees will be a major consideration in all workplace designs, equipment purchases, training programs and work procedures.

PROMOTE employee awareness of this policy, and provide the necessary resources for employees to integrate environment, health and safety into their activities.

COMMUNICATE our progress openly and on a timely basis with employees, the public, governments and other communities of interest, and our data security principles with our customers.

PREVENT injuries and ill health to our employees, contractors, and visitors while working to achieve a zero harm workplace.

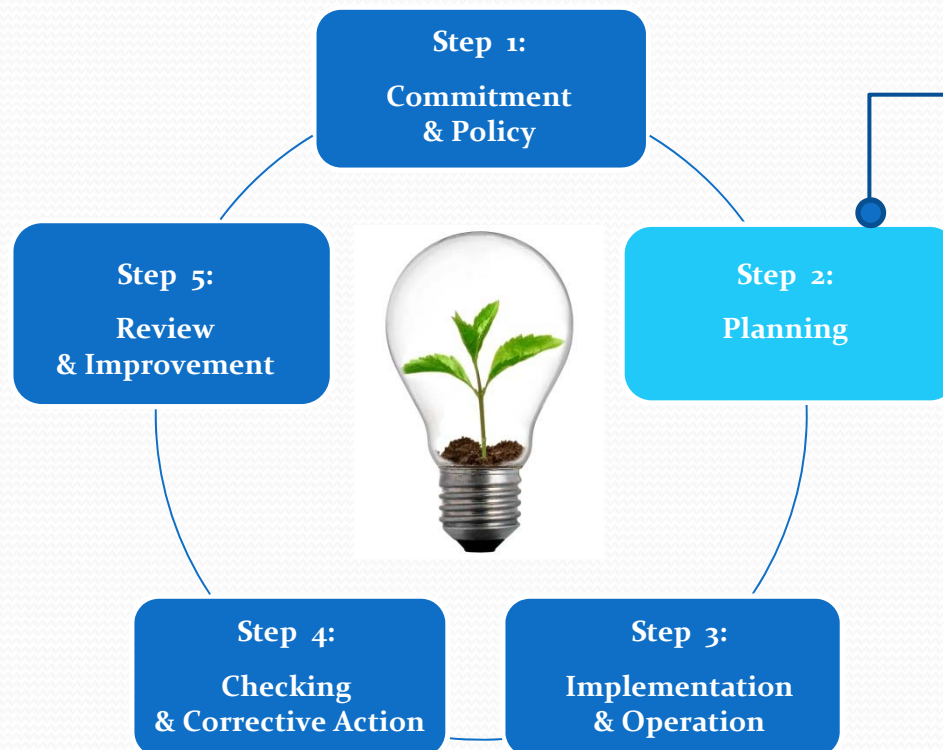
A handwritten signature in black ink that reads 'Stephen Skumac'.

Stephen Skumac
President

Planning:

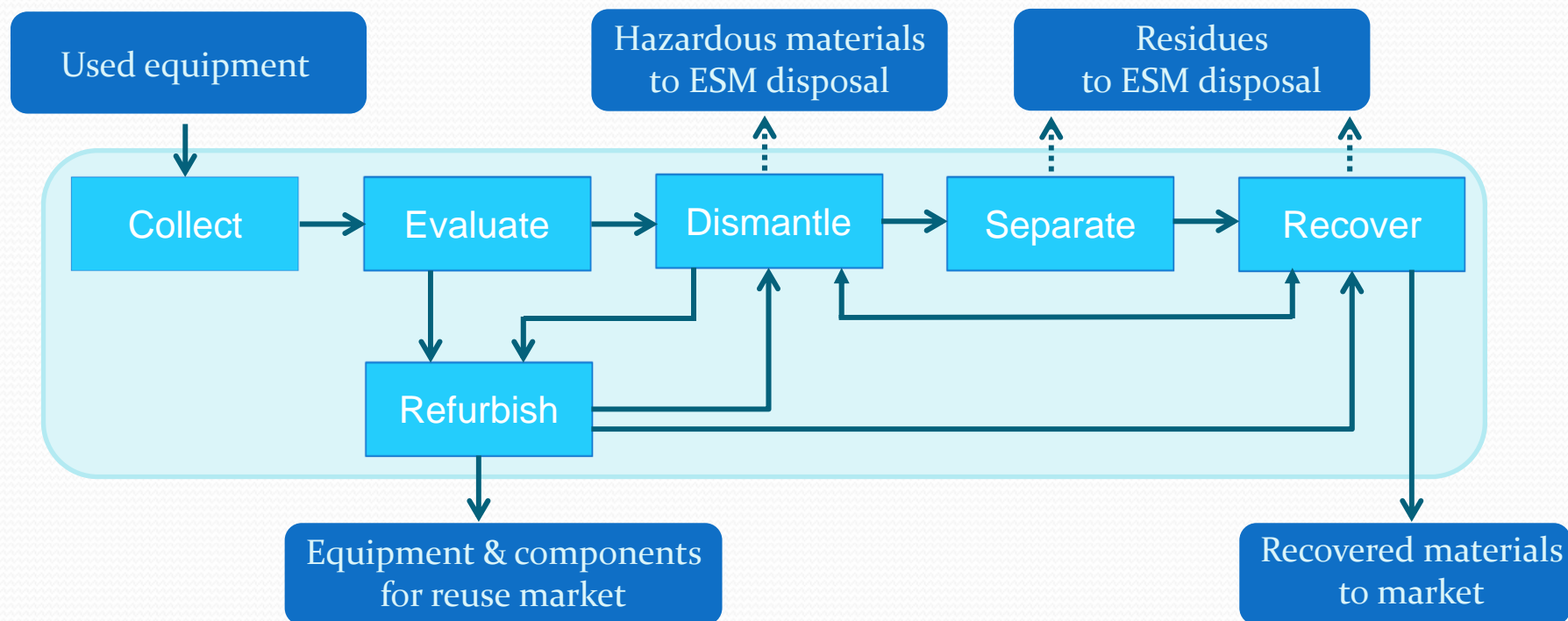
Failing to plan is planning to fail

- Good planning is critical to fulfill a EHS policy
- It focuses resources on areas that are most important to achieve goals

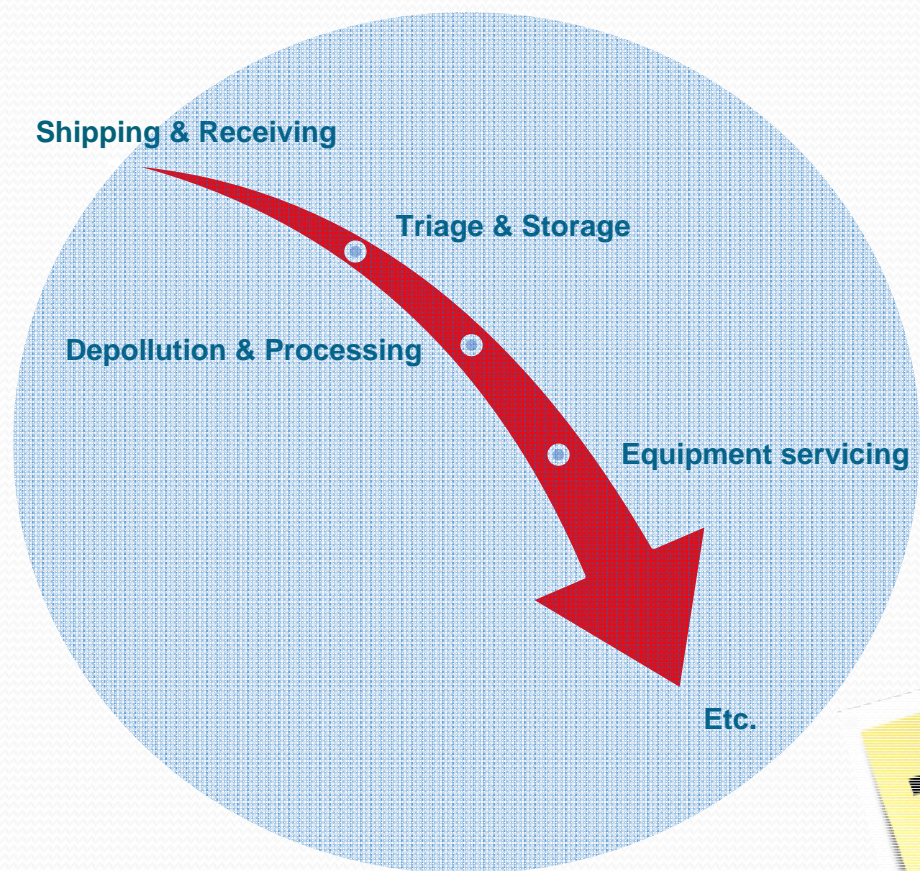


- Prioritize EHS aspects & impacts
- Legal & other requirements
 - ✓ Regulations, orders, permits
 - ✓ Treaties, conventions
 - ✓ Voluntary agreements
 - ✓ Internal performance criteria
- Objectives, targets & programmes
- Performance indicators

Avoid or mitigate problems during all stages of e-processing



All EHS aspects & impacts should be identified throughout an organization



What is an EHS aspect?

Any element of an organization's activities or products or services that can interact with the environment, health or safety

What is an EHS impact?

Any change to environment, health or safety (i.e. adverse or beneficial) resulting from an organization's EHS aspects

Tip!

- Aspects can lead to impacts
- Aspects = causes
- Impacts = effects
- Focus on things you can influence

(Refer to handout for examples)

What EHS aspects & impacts could be considered for these activities?



Example 1: Packaging electronics



<u>EHS ASPECT</u>		<u>EHS IMPACT</u>
Heavy equipment	↔	Back strain / injury
Charged capacitors	↔	Electrical shock
Breakage	↔	Site contamination

Example 2: Forklift loading bay



<u>EHS ASPECT</u>		<u>EHS IMPACT</u>
Reversing vehicles	↔	Back strain / injury
Heavy payload	↔	Injury (overturning)
Loud noise	↔	Impaired hearing

What EHS aspects & impacts could be considered for these activities?



Scenario 1: Informal plastics sorting

Scenario 2: Informal shredding



<u>EHS ASPECT</u>	<u>EHS IMPACT</u>
Cause (Hazard)?	Effect (Risk)?

↔

<u>EHS ASPECT</u>	<u>EHS IMPACT</u>
Cause (Hazard)?	Effect (Risk)?

↔

What EHS aspects & impacts could be considered for these activities?



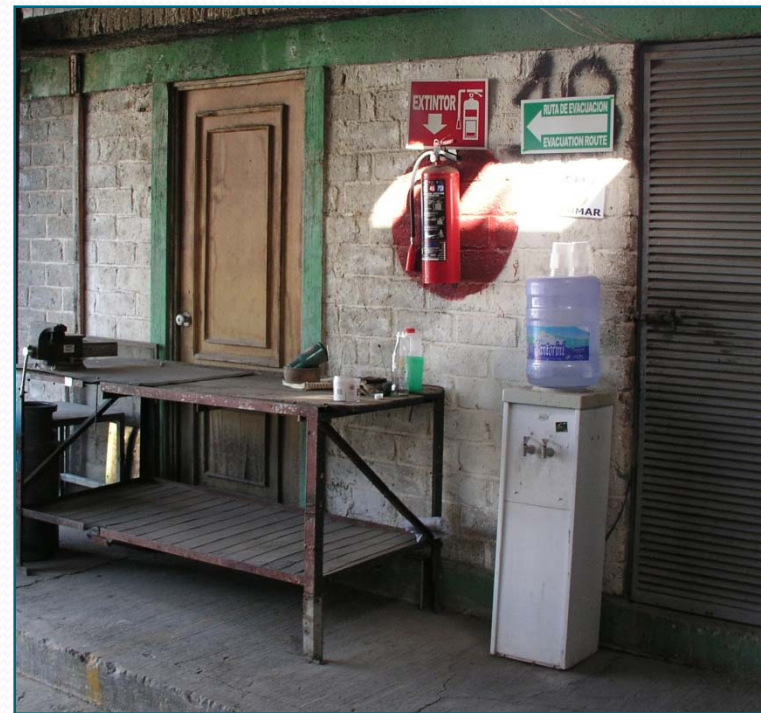
Scenario 3: Disassembling FPDs



<u>EHS ASPECT</u>	<u>EHS IMPACT</u>
Cause (Hazard)?	Effect (Risk)?

↔

Scenario 4: Work station



<u>EHS ASPECT</u>	<u>EHS IMPACT</u>
Cause (Hazard)?	Effect (Risk)?

↔

Prioritize EHS aspects to address critical risks first

Best practice

Example

- Identify all activities, products & services
 - Identify EHS aspects & impacts for each
 - Identify hazards (source of harm)
 - Identify risks for each (likelihood of harm)
 - Prioritize hazards by risk
 - Identify hazard controls to prevent or limit risks
- ✓ Administrative controls
 - ✓ Engineering controls
 - ✓ Personal protective equipment
 - ✓ Other



Prioritizing EHS Risks



Best practice

Example

Courtesy of CDI Computer Dealers Inc.

SECTION 1:

COMPLETED BY: <i>C. BRISTOW</i>	SIGNATURE: <i>[Signature]</i>	DATE: <i>23/7/12</i> DD MM YY	TIME: <i>10:18</i> am
REVIEWED BY: <i>Peter Lee</i>	SIGNATURE: <i>[Signature]</i>	DATE: <i>27 Jul 12</i> DD MM YY	TIME: <i>13:50</i> am

SECTION 2 (Completed by individual(s) completing task analysis)

HAZARD NUMBER	HAZARD	GENERAL LOSS EXPOSURES	RISK EVALUATION <small>(see reverse)</small>				RECOMMENDED CONTROLS <small>(see reverse)</small>						
			Severity	Frequency	Probability	Criticality Rating	Engineering	Preferred Practices	Administrative Controls	Health Monitoring	Hygiene Practices and Facilities	Medical Surveillance	Personal Protective Equipment
1	Forklift	Injury to Forklift Driver from an accident	6	3	0	9		X	X				X
		Damage to equipment	6	3	0	9	X	X	X				X
2	Lifting	Back strains/pain	4	3	-1	6	X	X	X				X
3	Opening Boxes	Cuts/Laceration	2	2	-1	3		X	X				X
4	Chemical Spill	Personal Health	2	2	-1	3		X	X		X		X
		Environmental Loss	2	2	-1	3		X	X				

This is a publicly available example. Use does not imply company endorsement.

Adopt a systematic approach to ensure legal compliance



Consolidate legal & other requirements using a master table

Best practice

Example

The master table may include:

- ✓ Name of regulation
- ✓ Current date / revision date
- ✓ Source of regulation
- ✓ Applicable to current operations (yes/no)
- ✓ Applicability by type of operation
- ✓ Specific legal or other requirements
- ✓ Internal compliance controls
- ✓ Record storage location
- ✓ Responsibility for record retention
- ✓ Record retention period



Example of a master table

Best practice

Courtesy of FCM Recycling

Example

	Law	Date	Source	Applicability	Rule	Action	Record-keeping				
	A	B	C	D	E	F	G	H	I	J	K
	DOCUMENT NAME	NUMBER	CURRENT REVISION / CURRENCY DATE	LOCATION OF LEGISLATION / REGULATION	IS LEGISLATION / REGULATION APPLICABLE TO THE OPERATION ?	SPECIFIC LEGISLATION / REGULATION APPLICABLE TO THE OPERATION	SPECIFIC SECTION OF LEGISLATION / REGULATION	FCM COMPLIANCE CONTROLS FOR SPECIFIC SECTION OF LEGISLATION / REGULATION	RECORD STORAGE LOCATION	RESPONSIBLE FOR RECORD RETENTION	RECORD RETENTION PERIOD
1	FEDERAL										
2											
3											
4	Canadian Environmental Protection Act	s.c. 1939, c. 33	20-Mar-12	http://laws-lois.justice.gc.ca/eng/acts/C-15.31/index.html	YES		95.1 Where there occurs or is a likelihood of a release into the environment of a substance specified on the List of Toxic Substances in Schedule 1 in contravention of a regulation made under section 92.1 or 93 or an order made under section 94, any person described in subsection (2) shall, as soon as possible in the circumstances; notify an enforcement officer or any other person designated pursuant to the regulations and provide a written report on the matter to the enforcement officer or other person:	Response: Emergency Response Plan			
5			20-Mar-12				46 to 50: The National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases (to air, water and land),	Response: FCM is registered and report is produced	Office	Vice-president Env & conformity	Until Superceedec
6			20-Feb-12	http://laws-lois.justice.gc.ca/PDF/SOR-2002-301.pdf	YES	Interprovincial Movement of Hazardous Waste Regulations (SOR / 2002-301)	3. (1) No person shall transport hazardous waste within Canada unless the waste is accompanied by a manifest in accordance with these Regulations.	Response: Conform manifest is used	Office	Operations Manager	Until Superceedec
7											
8			20-Mar-12	http://laws-lois.justice.gc.ca/PDF/SOR-2005-149.pdf	YES	Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149)	10 to 14: Movement Document and Record Retention Period	Response: Conform manifest is used. All shipping document are kept for at least 5 years	Office	Operations Manager	5 years at least
9											
10	Transportation of Dangerous goods Act	S.C. 1992, c.34	20-Mar-12	http://laws-lois.justice.gc.ca/PDF/T-19.01.pdf	YES		5. Safety Requirements, Security Requirements, Safety Standards and Safety Marks	Response: WHMIS Training. If uncertainty arises, call must be made to Canuteq: 1-813-932-4624; Transport Canada: tmd-tdg@tc.gc.ca (1-866-395-3737); Environment Canada: 1-800-868-8767 or at 1-813-953-2171 (Susan Easton)			
11											
12				http://laws-lois.justice.gc.ca/PDF/H-			SCHEDULE II (section 2) : list	Response: Emergency Response Guidebook 2008 from Canuteq; CSST PDF: Entreposage des	Office	Operations Manager	Until Superceedec

Facility

This is a publicly available example. Use does not imply company endorsement.

Schedule legal & other requirements using a compliance calendar



	A	B	C	D	E
33	Delta	Lewis Castle	2013-01-27	2016-01-26	
34	Delta	Jay Brewer			Began but not completed yet
35					
36	Environmental Compliance Assessment (External Audit) - Annual				
37	Location	Name	Done	Expiry	Comments
38	Lavaltrie 71	C. Karambatsos	2012-02-23	2013-02-23	
39	Lavaltrie 91	C. Karambatsos	2012-02-23	2013-02-23	
40	Cornwall	C. Karambatsos	2012-12-11	2013-12-11	
41	Halifax	C. Karambatsos	2012-09-08	2013-09-08	
42	Delta	C. Karambatsos	2012-10-13	2013-10-13	
43	Toronto	C. Karambatsos	2013-01-23	2014-01-23	
44					
45	Employee Blood Tests - Annual				
46	Location	Name	Done	Expiry	Comments
47	Lavaltrie 71	C. Karambatsos	2012-10-19	2013-10-19	
48	Lavaltrie 91	C. Karambatsos	2012-10-01	2013-10-01	
49	Cornwall	C. Karambatsos	2012-08-29	2013-08-29	
50	Halifax	C. Karambatsos	2012-10-16	2013-10-16	
51	Delta	C. Karambatsos	2013-04-15	2014-04-15	
52	Toronto	C. Karambatsos			Scheduled in July 2013
53					
54	Inventory & Inspection of HazMat Room (every 3 months)				
55	Location	Name	Done	Expiry	Comments
56	Lavaltrie 71	D. Dumais	2013-03-15	2013-06-15	
57	Lavaltrie 91	L. Chayer	2013-03-15	2013-06-15	
58	Cornwall	J.Latreille	2013-03-15	2013-06-15	
59	Halifax	K. Pettipas	2013-03-15	2013-06-15	
60	Delta	J.Rabbior	2013-03-15	2013-06-15	
61	Toronto	R. Pomilos	2013-03-15	2013-06-15	
62					
63					

Example

Best practice

Courtesy of FCM Recycling

This is a publicly available example. Use does not imply company endorsement.

Performance indicators track progress

What gets measured gets managed



- Specify numeric & qualitative indicators
- Identify how these indicators will be measured

Category	Example of Indicators	Sources of Data to use for Measuring
Health & Safety	<ul style="list-style-type: none"> ▪ Worker lost time incidents: goal of zero each year ▪ Medical leave incidents: goal of zero each year ▪ Reportable incidents: goal of zero each year ▪ Compliance with usage of personal protective equipment as per company guidelines: goal of 100% ▪ Compliance for all required training objectives for worker health and safety: goal of 100% ▪ Concentration of heavy metals in workers working with heavy metals: goal of 0% 	<ul style="list-style-type: none"> ▪ Accident/incident reports ▪ Observations/inspections with reports ▪ Training completion records ▪ Blood work monitoring semi-annually / annually

Implementation & Operation:

Ideas are easy. Implementation is hard!

- Systematic approach to integrate environmental, health & safety considerations into day-to-day activities of an organization



- Roles & responsibilities
- Competence, training & awareness
- Internal & external communication
- Administrative controls
 - ✓ Documentation & procedures (e.g. D/S services, emergency)
- Engineering controls
 - ✓ Pollution & safety control (e.g. filters, spill curbs)
- Personal protective equipment
 - ✓ Masks, gloves, safety boots

Assign clear roles & responsibilities to fully integrate the management system

Environmental responsibilities in an SME	Person/Function responsible
Establish overall direction	Managing Director
Develop environmental policy	Environmental Manager
Develop environmental objectives, targets and programmes	Relevant Managers
Monitor overall EMS performance	Environmental Manager
Assure regulatory compliance	Operating Manager
Ensure EMS compliance	All managers
Ensure continual improvement	All managers
Identify customer expectations	Sales and Marketing staff
Identify suppliers' expectations	Purchasing staff, Buyers
Develop and maintain accounting procedures	Finance Manager, Controller
Comply with defined procedures	All staff

Example

Best practice

Employee training & community outreach...



Case Study

Example

- *Technologies Displays Mexicana S.A de C.V (TDM)* processes CRTs in Mexico



Issue:

- Strong competition for workers in the region resulted in high staff turnover
- Needed a strategy to retain workers & raise ecological consciousness

This is a publicly available example. Use does not imply company endorsement.

...provided clear benefits to one Mexican e-recycler

Case Study

Example

Action:

- TDM implemented a policy to communicate its commitment to EHS & the positive impacts of its recycling practices, via:
 - 1) orientation training
 - 2) workshops held every 2 or 3 months
 - 3) outreach to the families & children of workers



Result:

- Staff turnover has slowed
- Enhanced integration of EHS policies & practices
- Company is now recognized as a “green” company in the community
- Resources for ongoing training & outreach are justified due to improvements

The single biggest problem in communication is the illusion that it has taken place



Identify what to communicate (internally & externally)

Best practice

Example

Communication may include:

- ✓ Organizational commitment to EHS
- ✓ EHS policy, objectives & targets
- ✓ Key contacts, roles & responsibilities
- ✓ Compliance with legal & other requirements
- ✓ EHS programmes
- ✓ Workplace & other procedures
- ✓ Training
- ✓ Accidents, injuries & emergencies
- ✓ Performance & audit findings
- ✓ Ideas for continual improvement



Hierarchy of hazard controls

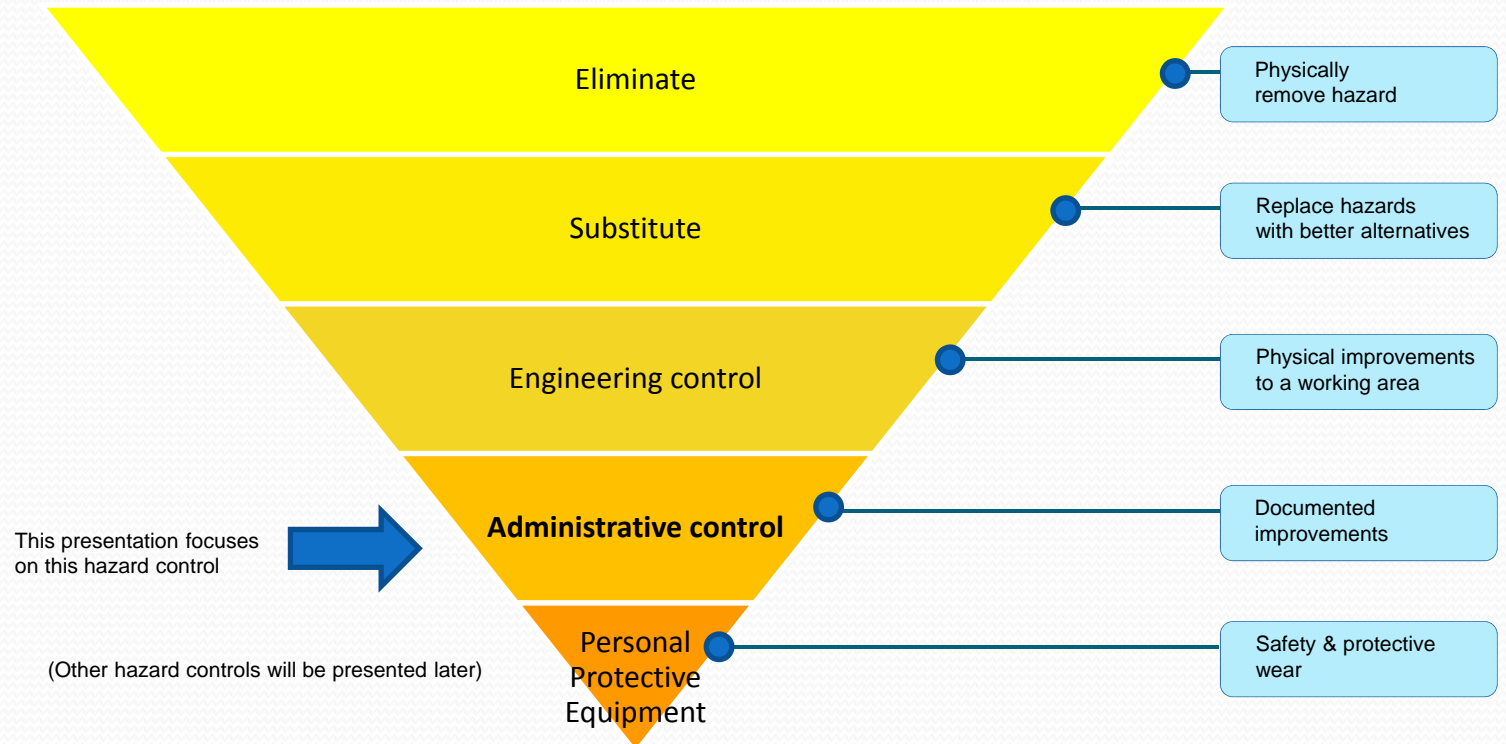
Best practice

Example

Most Effective



Least Effective



What types of hazard controls do you see?



Courtesy of Desco Electronic Recyclers

Photo provided for use as an example only. Use does not imply company endorsement.

Hazard controls – Administrative controls

Best practice

Example

- Administrative controls change the way people work
- Approaches often involve documents, training & supervision

- Administrative controls may include **procedures & practices**:

- | | |
|---|--|
| <input checked="" type="checkbox"/> EHS aspects identification procedures | <input checked="" type="checkbox"/> Good housekeeping practices |
| <input checked="" type="checkbox"/> Legal compliance procedures | <input checked="" type="checkbox"/> Storage & shipping practices |
| <input checked="" type="checkbox"/> Maintenance & repair procedures | <input checked="" type="checkbox"/> Dismantling practices |
| <input checked="" type="checkbox"/> Hazmat handling & storage procedures | <input checked="" type="checkbox"/> Personal hygiene practices |
| <input checked="" type="checkbox"/> Incident reporting procedures | <input checked="" type="checkbox"/> Processing practices |
| <input checked="" type="checkbox"/> Emergency response procedures | <input checked="" type="checkbox"/> Spill clean-up practices |
| <input checked="" type="checkbox"/> Contingency planning procedures | <input checked="" type="checkbox"/> Downstream processor selection practices |
| <input checked="" type="checkbox"/> Record-keeping & documentation procedures | <input checked="" type="checkbox"/> Client relations |
| <input checked="" type="checkbox"/> Communication procedures | |

Establish a documented process to evaluate & select downstream recyclers

Best practice

Example

It takes many good deeds to build a good reputation & only one bad one to lose it

- Gather evidence to verify if an EHS management system is in place by reviewing:
 - ✓ Facility credentials (e.g. permits, certifications)
 - ✓ Compliance history & first responder incidents
 - ✓ Hazard controls in place (e.g. administrative, engineering, PPE)
 - ✓ Insurance coverage (e.g. liability, workers compensation)
 - ✓ Completeness of plans & procedures (e.g. emergency, spill, closure, injury prevention)
 - ✓ Availability of material tracking systems (including certificates of destruction/processing)
 - ✓ Percentage of materials reused or recycled (versus disposed)
 - ✓ Handling & final disposition of materials (i.e. hazardous & non-hazardous)
 - ✓ Downstream processor selection criteria
 - ✓ Exports, particularly to non-OECD countries
 - ✓ On-site operations in real time (e.g. in-person, live video feed)
 - ✓ Worker EHS awareness & competency (e.g. via interviews)
 - ✓ Site & data security measures

Hazard controls – Administrative controls

Best practice

Example

- Administrative controls change the way people work
- Approaches often involve documents, training & supervision

- Administrative controls may include schedules & checklists:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Worker training schedules | <input checked="" type="checkbox"/> “Do Not Accept” checklists |
| <input checked="" type="checkbox"/> Employee blood testing schedules | <input checked="" type="checkbox"/> Safety checklists |
| <input checked="" type="checkbox"/> Job rotation schedules | <input checked="" type="checkbox"/> Inspection checklists |
| <input checked="" type="checkbox"/> Worker rest schedules | <input checked="" type="checkbox"/> Maintenance checklists |
| <input checked="" type="checkbox"/> Maintenance schedules | <input checked="" type="checkbox"/> Compliance checklists |
| <input checked="" type="checkbox"/> Monitoring schedules | <input checked="" type="checkbox"/> Audit checklists |
| <input checked="" type="checkbox"/> Reporting schedules | |

Use “Do Not Accept” lists to avoid unwanted materials

Best practice

Example

- ✓ Accept materials you want
- ✓ Reject materials you don't want
- ✓ Consider what you can safely manage
- ✓ Clearly list what you will & will not take
- ✓ Communicate these rules to clients & workers
- ✓ Plan for contaminants & “gifts”
- ✓ Work with clients to address issues
- ✓ Redirect materials you don't want



“Do Not Accept” List



List of Acceptable and Non-Acceptable Items for E-Waste Fundraisers

Items Accepted

Electronic Waste with a Screen

- CRT Monitors, Televisions
- Liquid Crystal Display (LCD) Monitors & Televisions
- Light Emitting Diode (LED) Monitors & Televisions
- Plasma Televisions
- Projection Televisions
- Laptop PCs

Computers

- Desktop PCs
- Servers
- Network Equipment
- Main Frame Computers
- Printed Circuit Boards
- Laptop & Computer Power Supply Units
- Keyboards & Mice
- Computer Speakers
- All Computer Peripherals

Office Products

- Printers (Remove paper, toner & ink cartridges)
- Copiers (Remove paper, toner & ink cartridges)
- Fax Machines (Remove paper, toner & ink cartridges)
- Multi-Function Devices (Remove paper, toner & ink cartridges)
- Laser Scanners
- Telecom Equipment

Consumer Electronics

- VCRs & DVD players & Recorders
- Compact Disc & Tape Players
- Calculators
- Telephones
- Cell Phones & PDAs (with batteries Removed)
- Digital Cameras
- Stereo Equipment
- Speakers (Non-Wood Speakers Only)
- Electronic Cables
- Video Game Consoles
- Microwaves
- Small Kitchen Appliances such as mixers and toasters
- Car Stereos
- Power Cords & Power Strips
- Vacuums
- Registers

Media

- Hard Drives
- Zip Drives
- Backup Drives

Items Not Accepted

- All Non-Electronic Waste – Items that do not have **BOTH** a circuit board and a power cord
- Techno-Trash including: CD's/DVD's, VHS, Beta, Cassettes, DAT Tapes, Memory Sticks, & Floppy Discs
- Batteries: household (AA, AAA, DD, etc.) and Car
- All Lamps and Fluorescent Light Bulbs, incandescent Light Bulbs, and Christmas Tree Lights
- Hazardous Household Waste, including Paint, Pesticides, Used Oil, Cleaning Supplies, Propane Tanks, Fire Extinguishers, or Tires
- Contaminated Electronic Waste such as medical equipment that has not been de-contaminated
- Large Household Appliances such as, Refrigerators, Washer and Dryers, Stoves, Ovens, Water Heaters, Air Conditioners, etc.
- Household Items: Furniture, Thermostats, Cordless Power Tools, Toys, Irons, Smoke Detectors
- All Wood, including wood-encased Stereo Speakers
- Solar Panels

*****Handlers who conduct any type of e-waste treatment (which can be as simple as cutting power cords off monitors) are subject to fines and or termination of event through the Department of Toxic Substance Control*****

Courtesy of California Electronic Asset Recovery

These vary by facility

Common issues:

- Consumer batteries
- Medical equipment
- HVAC equipment
- Smoke detectors
- Thermostats
- Solar panels
- Other

Hazard controls – Administrative controls

Best practice

Example

- Administrative controls change the way people work
- Approaches often involve documents, training & supervision

- Administrative controls may include **signs, training & oversight**:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Warning signs | <input checked="" type="checkbox"/> EHS training |
| <input checked="" type="checkbox"/> Placards | <input checked="" type="checkbox"/> Internal approvals |
| <input checked="" type="checkbox"/> Labels | <input checked="" type="checkbox"/> Health & Safety Committee |
| <input checked="" type="checkbox"/> Testing stickers | <input checked="" type="checkbox"/> Injury & Illness Prevention |
| <input checked="" type="checkbox"/> Bulletin boards | <input checked="" type="checkbox"/> Inspections |
| <input checked="" type="checkbox"/> Maps | <input checked="" type="checkbox"/> Emergency plans |
| <input checked="" type="checkbox"/> Directories | <input checked="" type="checkbox"/> Financial guarantees
(e.g. surety bond / insurance) |
| <input checked="" type="checkbox"/> Speed limits | <input checked="" type="checkbox"/> <i>Site closure & after care plans</i> |
| <input checked="" type="checkbox"/> Alarms | |



California Department of
Toxic Substances Control

<https://dtsc.ca.gov/HazardousWaste/EWaste/upload/Closure-and-Financial-Requirements-for-Recyclers.pdf>

Signs are visual administrative controls



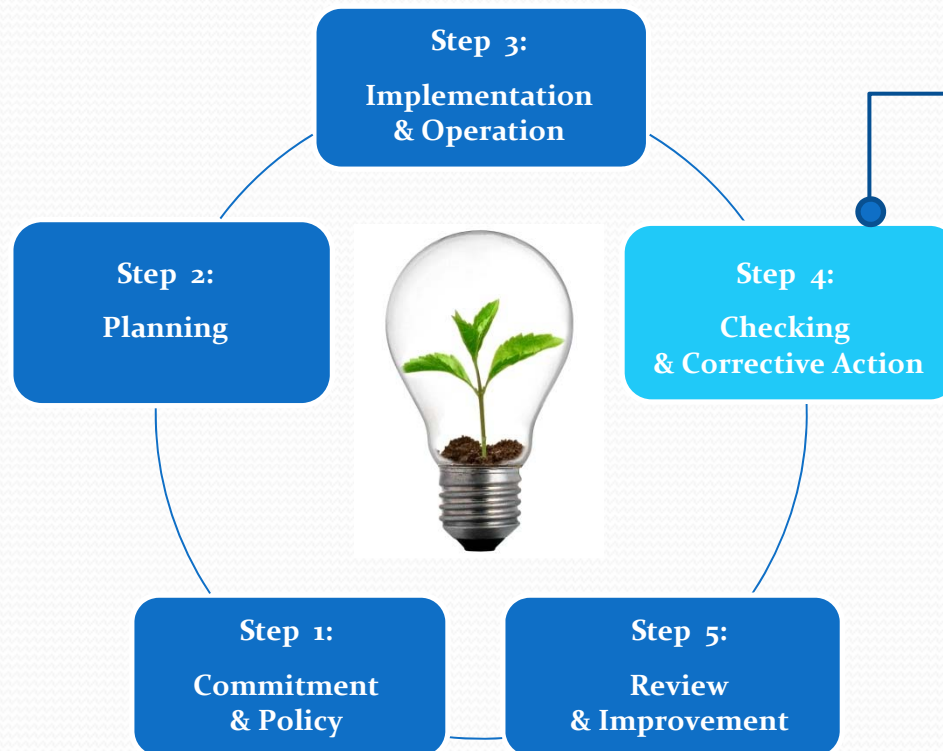
Courtesy of Desco Electronic Recyclers

Photos provided for use as examples only. Use does not imply company endorsement.

Checking & Corrective Action:

An ounce of performance is worth pounds of promises

- Check the results of a decision against expectations to identify strengths, areas of improvement, & where knowledge or information is lacking



- Monitoring & measurement
- Evaluation of compliance
- Identify non-conformities
- Corrective & preventative action
- Control of records
- Internal audit



Measuring & monitoring performance is essential to ensure EHS goals are met

- Focus on operations & activities that can have significant EHS impacts
- Regularly calibrate measuring & monitoring equipment
- Data helps to identify non-conformities & other deficiencies
- Periodically share findings at management review meetings

1. Operations Monitoring:

- *collecting information to monitor systems & processes that can affect human health & environment (e.g. legal, safety, effluents & emissions, hazardous materials & wastes...)*

2. Systems Monitoring:

- *collecting information to monitor adherence to company policies & EHS objectives (e.g. goals, objectives, targets, training communication, corrective actions...)*

Performance Measurement & Monitoring Procedure

Purpose:

- The purpose of this procedure is to ensure that those operations and activities that can have a significant impact on the environment are measured and monitored on a regular basis in order to track health and environmental performance and compliance with objectives, targets and legal requirements.

Scope:

- The operation's significant environmental and health impacts which need to be measured and monitored.

Definitions:

- **Operational monitoring** includes the collection of data on the company's systems and processes that may significantly impact human health or the environment. Examples include air emissions monitoring, waste water quality monitoring, waste generation, and recycling volumes.
- **Systems monitoring** includes collecting information about the performance of the company in conforming to its policies and meeting environmental objectives. This includes tracking and reporting on the main elements of an EHS policy, including goals, objectives, targets, training, communication, corrective actions etc.

Responsibilities:

- It is the responsibility of the Supervisor to: accurately measure and monitor all on-site and off-site activities and operations which can have a significant human health or environmental impact.
- It is the responsibility of the Management Representative to: collate, review and summarize the records of performance; and report on environmental performance.

Procedures:

Operational monitoring: The company has a monitoring and recording program that covers: legal requirements; safety requirements; effluents and emissions; incoming, stored and outgoing waste, in particular hazardous waste.

- Details of measurement and monitoring activities related to the above should be defined in an appendix, along with other measures planned to help the company achieve its objectives and targets [e.g. reference other documents such as policies, procedures and permits]
- Records of measurement and monitoring activities should be established and maintained
- All relevant environmental records are to be maintained and made available to the competent authorities upon request in accordance with applicable legal requirements
- The company will maintain records of the generation, collection, recovery or disposal of waste, its types and amounts
- Such records shall show performance over time, e.g. monthly water consumption. Performance data shall typically include quantities, costs or other suitable key characteristics to enable comparison against the company's goals, objectives and targets
- Measurement and monitoring records shall be kept up-to-date
- Measurement and monitoring data shall be analyzed in order to evaluate environmental performance

Systems monitoring:

- A summary of environmental performance data shall be provided at Management Review meetings where performance shall be assessed against the environmental, health and safety goals, objectives and targets specified in the Environmental Health and Safety (EHS) Policy and Program
- Measurement and monitoring equipment used shall be calibrated in accordance with the Calibration Control Procedure of the Quality Management System and if not present through a certified service supplier

References:

- [List appropriate references that your company used in the development of the procedure]

Example

Best practice



Implement a tracking system to measure & track the flow of materials

On the Floor

The information you track should include:

- Types, weight, volume and original generators of incoming equipment, materials and wastes using an inventory control system with parameters relevant to your company, and your certification processes if applicable (for example, some certifications require tracking of serial numbers of equipment)
- For refurbishing equipment, software or hardware update, testing and/or repair requirements
- Types, weight, volume and downstream processors/receivers of outgoing equipment, materials and wastes



You should track both total weight and percentage by weight of each of these groups:

- Reuse / refurbishment
- Material recovery / recycling
- Disposal (at non-hazardous solid waste management facilities)
- Disposal (at hazardous waste management facilities)

Information about wastes should be divided into categories:

- CRT glass or other leaded glass
- Mercury-containing devices
- Batteries containing mercury, cadmium, lead or acid
- Lithium ion batteries
- Other batteries
- Printer or copy drums or other materials containing arsenic or selenium
- Polychlorinated biphenyl (PCB) equipment
- Radioactive materials
- Toners and inks and their containers/cartridges
- Antifreeze or coolant glycols

Example

Best practice

Compliance Evaluation Procedure

Purpose:

- The purpose of this procedure is to ensure that the company has a documented means of periodically evaluating compliance with relevant Environmental, Health and Safety (EHS) legal requirements, or other ESM criteria, based on OECD core performance elements (as per OECD Council Recommendation C(2004)100 on the Environmentally Sound Management (ESM) of Waste)

Scope:

- The company maintains an Environmental, Health and Safety program and evaluates compliance from a program level. This approach ensures that permits, regulatory changes, and operational changes are incorporated into the company's Environmental, Health and Safety compliance program
- This procedure will be reviewed annually and revised when deemed necessary

Responsibilities:

- The Manager is responsible for ensuring that operations managers comply with applicable legal requirements and other requirements pertaining to Environmental, Health and Safety
- The Manager reviews and approves all program and project plans designed to meet or exceed the applicable legal requirements for the operation and maintenance activities of the company. In addition, the Management Representative will review all inspection checklists and audit reports to ensure that observations, areas of concern, notices of violation or Environment, Health and Safety nonconformance issues are addressed in a timely and correct manner
- Supervisors are responsible for complying with the Environment, Health and Safety legal requirements
- Supervisors are also responsible for meeting legal requirements that pertain to the operation of the company. Operations Managers will review all inspections and ensure that all staff are informed, trained and comply with all applicable legal requirements associated with their areas of responsibility

Procedures:

- Compliance assessments are accomplished through routine inspections conducted by the company's staff to ensure that applicable legal requirements and ESM criteria are fulfilled on a continuous basis
- Supervisors shall routinely train their staff and monitor their performance for all regulated activity within their area of operations. Training and performance monitoring can be accomplished internally or through an appropriate outside resource
- Periodic inspections are conducted to ensure the company is meeting the applicable legal requirements associated with the company's operations
- When periodic site visits are scheduled, Supervisors will ensure that all personnel, equipment and resources required to complete the activity are available
- The Manager shall establish a schedule in which the company will assess its legal compliance. The results of this report will be sent to the Management Team for action and for record retention
- Supervisors are responsible for correcting all deficiencies identified through their internal and external inspections, audits, or as a result of new or modified regulations and permit conditions. Corrective action will be directed by regulatory agencies, the Manager, or through corrective/preventative action requests as a result of internal audits or observations by the staff. Results of all legal compliance and other audits and inspections will be sent to Management for review and corrective action

References:

- [List appropriate references that your company used in the development of this procedure]

Example

Best practice

Compliance Evaluation Checklist

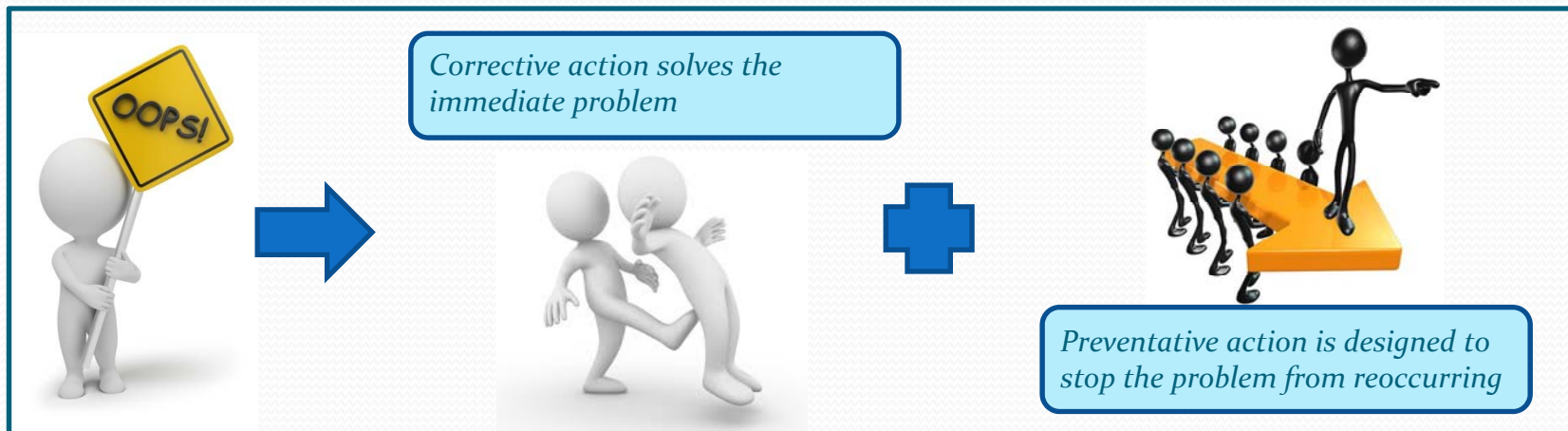
Items to Review	Y/N/NA	Action?
Has the company established a procedure to measure and monitor the key characteristics of its operations and activities that can have a significant impact on the environment or worker health and safety?		
Are the key characteristics of activities and services that can have a significant impact on the environment or worker health and safety regularly measured and monitored in accordance with the procedure?		
Does this procedure include calibration and maintenance requirements for equipment?		
Does this procedure include personal protective equipment?		
Does this procedure note that records should be retained?		
Does the procedure outline the requirements of the program to periodically review regulatory compliance and report results to management on a yearly basis?		
Does management ensure that the facility is at all times in compliance with applicable legal requirements regarding the environment, and occupational health and safety?		
Is there a responsibility and process to identify new or amended regulations?		

Example

Best practice

Identify non-conformities & take corrective & preventative action

- Identify & document non-conformities during performance monitoring
- Investigate non-conformities to determine their root causes
- Take action to avoid their recurrence
- Examine the need to implement further preventative actions
- Document actions taken & results achieved
- Review the long-term effectiveness of actions taken



Corrective Action Procedure

Purpose:

- This procedure sets out the requirements for dealing with actual and potential nonconformities and for taking corrective and preventative action

Scope:

- This procedure is concerned with nonconformities. This procedure covers both nonconformities with the company's EHS procedures and nonconformities with certification specifications (if applicable)
- Reports of nonconformities may result from external audits or may occur as part of routine operations

Definition:

- Nonconformity – non-fulfillment of a requirement
- Corrective Action - action taken to eliminate the cause of a detected nonconformity
- Preventative Action - action taken to eliminate the cause of a potential nonconformity or avoid repetition of the same nonconformity

Responsibilities:

- It is the responsibility of the nominated Management Representative to prepare and issue a non-conformance report when a nonconformity is detected
- It is the responsibility of all employees to bring suspected nonconformities to the attention of the Management Representative or Supervisor
- Operations Managers and Supervisors will comply with all corrective and preventative actions prescribed
- The Management Representative will establish and maintain a reporting and record keeping system for nonconformities, corrective and preventative action
- Nonconformities, corrective and preventative actions will be reviewed through Management Reviews

Procedures:

- The underlying cause(s) of the nonconformity must be investigated
- Appropriate and timely corrective action must be taken according to the nature of the nonconformity.
- Preventative action, such as implementing modifying or enforcing procedures or controls, will be taken to avoid repetition of the nonconformity, or to prevent a potential nonconformity from occurring
- Any corrective or preventative action taken to address the causes of an actual or potential nonconformity must be appropriate to the magnitude of problems and commensurate with the impact encountered
- The Management Representative will implement and maintain a system of reporting and record keeping for nonconformities, corrective and preventative action
- Any changes to the EHS procedures as a result of corrective or preventative action will be recorded
- A non-conformance report or form will detail the nature and scale of the nonconformity, proposed corrective and preventative actions as appropriate, include references to procedure number and date, and will include timescales, where relevant
- Repeated nonconformities of the same nature or significant deviations from procedures (for example, disregard of the procedures) will be reported to the Supervisor for action and resolution
- Significant deviations from the environmental policy will be reported to the Management Representative
- A report will be submitted to the Management representative on a regular basis, reviewing all nonconformities and their respective corrective and preventative actions. The report will include: review of non-conformance reports; review of corrective actions; review of preventative actions; review of environmental complaints; review of internal or external EHS audits
- Preventative actions involving long term programming will be considered in the setting of objectives or targets

References:

- [List appropriate references used by your company in the development of this procedure]

Example

Best practice

Measuring Performance is important because it:



Verifies Whether Objectives Have Been Met

Allows for Corrective Action

Record keeping is an important part of the Performance Measurement process because it:



Provides a Mechanism by Which Transparency can be Achieved

Allows for Checking and Verification, as may be Required for Legal Compliance

Record-keeping provides many benefits to an organization

- ✓ Identify & confirm if a problem exists
- ✓ Enable early corrective actions
- ✓ Measure & monitor effectiveness of corrective & preventative actions
- ✓ Support commitment to transparency & verification
- ✓ Demonstrate accountability in a timely manner
(e.g. to clients, regulators, certification bodies...)
- ✓ Facilitate internal & external audits
- ✓ Fosters organization at the workplace (utility of plans, procedures...)





Audits & Inspections (versus Performance Measurement)

- Both may be administered by the facility or through independent external assessment (e.g. auditing firms, government officials)

Performance Measurement:

- *the act of acquiring quantitative and qualitative data*
- *used to provide evidence to determine the level of progress made towards achieving specific defined goals, objectives and targets*

Audits/Inspections:

- *an unbiased review of a facility's current progress at meeting ESM requirements & other criteria, such as specific defined organizational goals, objectives & targets*
- *reports the facility's success level and any improvements or corrective actions that could be implemented to improve performance by addressing non-conformities & deficiencies*
- *conduct at planned intervals by competent individuals*

Sample Checklist For Auditing Documents

Extract from 2010 EPSC Recycler Qualification Program

6.0 DOCUMENTS / RECORDS SAMPLED		
	Document	Date / Version / Findings
<input type="checkbox"/>	Environment / Health and Safety Manual	
<input type="checkbox"/>	Environment / Health and Safety Policy	
<input type="checkbox"/>	Organizational Chart	
<input type="checkbox"/>	Job Descriptions and Responsibilities	
<input type="checkbox"/>	Training Matrix	
<input type="checkbox"/>	Training Programs	
<input type="checkbox"/>	Orientation Checklist / Training	
<input type="checkbox"/>	Employee Handbook	
<input type="checkbox"/>	EHS Communication Materials	
<input type="checkbox"/>	Training Records / Certificates	
<input type="checkbox"/>	Visitor Information Package	
<input type="checkbox"/>	Contractor Training / Agreements	
<input type="checkbox"/>	Hazard / Incident / Accident Reports	
<input type="checkbox"/>	Hazard / Incident / Accident Investigations	
<input type="checkbox"/>	EHS Committee Meeting Minutes	
<input type="checkbox"/>	EHS Annual Review Meeting Minutes	
<input type="checkbox"/>	List of Legal and Other Requirements	
<input type="checkbox"/>	Certificate of Insurance	
<input type="checkbox"/>	Certificate of Workers Compensation	
<input type="checkbox"/>	Risk Assessment Procedure & Schedule	
<input type="checkbox"/>	Risk Assessment Ratings & Results	
<input type="checkbox"/>	Sampling program & Schedule	
<input type="checkbox"/>	Sampling Results (Air, Noise, Lead, etc.)	
<input type="checkbox"/>	Hazardous Material Inventory	
<input type="checkbox"/>	MSDS Inventory	
<input type="checkbox"/>	Program Material Tracking	
<input type="checkbox"/>	Closure Plan	
<input type="checkbox"/>	Program Material Contingency Plan	
<input type="checkbox"/>	Audit / Inspection Procedures & Schedule	
<input type="checkbox"/>	Audit Report / Inspection Records	
<input type="checkbox"/>	Emergency Response Plan / Procedures	
<input type="checkbox"/>	Emergency Drill Records	
<input type="checkbox"/>	Transporter Assessment & Approval Records	
<input type="checkbox"/>	TDG Process	
<input type="checkbox"/>	Material Shipment Records	
<input type="checkbox"/>	Recycler Assessment & Approval Records	
<input type="checkbox"/>	Downstream Material Flow	
<input type="checkbox"/>	Work Instructions / Operating Procedures	
<input type="checkbox"/>	Preventive Maintenance Program / Records	
<input type="checkbox"/>	EHS Objectives and Targets	
<input type="checkbox"/>	EHS Statistics	

Example

Best practice

This is a publicly available example. Use does not imply endorsement.

Audit Report Template

Essential elements of an Audit Report Form

Audit Number:

Title of Audit:

Date(s) Audit Conducted:

Scope / Objectives of Audit:

Auditee (Who / What / Where):

Audit Team

Lead Auditor:

Auditor:

Audit Team:

Reference Documents Reviewed in Audit:

Audit Summary: (summary of audit process including any obstacles encountered, audit findings, reference to supporting evidence, etc.)

Conclusions: (EMS conformance to the EMS audit criteria, whether the system is properly implemented and maintained, whether the internal management review process is able to ensure the continuing suitability and effectiveness of the EMS, etc.)

Distribution List for Audit Report:

Author of Audit Report

Name: Signature: Date:

Lead Auditor

Name: Signature: Date:

Uncontrolled // *Controlled* copy [*delete inappropriate status]

Revision date: Approved by:

Example

Best practice

Courtesy of Bureau of International Recycling

This is a publicly available example. Use does not imply endorsement.

Review & Improvement:

If you always do what you always did, you will always get what you always got

- Top management should periodically review the EHS management system to evaluate its suitability, adequacy & effectiveness



- Top management review
 - ✓ Audit results
 - ✓ EHS performance
 - ✓ Status of corrective actions
 - ✓ Changing circumstances (e.g. new laws, processes)
- Continual improvement
 - ✓ Outstanding deficiencies
 - ✓ New opportunities

Top Management Review Checklist

Items to Review	Y/N/NA	Action?
Did we achieve our objectives and targets?		
Should we modify our targets in light of new information pertaining to worker health and safety or environmental protection?		
Is our Environment, Health and Safety policy still relevant to what we do?		
Are roles and responsibilities clear and do they make sense?		
Are we applying resources appropriately?		
Are the worker health and safety procedures clear and adequate?		
Are the environmental protection procedures clear and adequate?		
Are workers using prescribed Personal Protective Equipment?		
Did workers take designated training at recommended intervals (e.g. refresher training, new systems training as appropriate?)		
Are we monitoring our management controls/systems?		
Do results from performance measurement results tell us that improvements are required?		
What effects have changes in equipment, materials or products had on our EHS and its effectiveness?		
Are there any upcoming changes in laws or regulations that will require us to change any of our procedures or equipment?		
Have there been any top management concerns raised since our last review?		
Is there a better way to achieve environment protection from our key processes? Are we using the best available technique (BAT) or practice?		
Were there any emergencies since our last management review? Did our company deal with the emergency in an appropriate timeline and manner?		
Are there any corrective actions required for our emergency plan?		

Example

Best practice

Annual EHS Report

- Period covered (Annual or Three year period for SME)
- List of plant(s) or site(s) certified to ISO 14001 and the CPEs of the OECD Council Recommendation C(2004)100 on the Environmentally Sound Management (ESM) of Waste
- Illnesses and Injuries
 - Lost time due to illness (e.g. number of cases per 200,000 hrs worked)
 - Lost time due to injuries (e.g. number of cases per 200,000 hrs worked)
- Environmental incidents
 - Number of major environmental incidents
 - Number of minor environmental incidents
- Energy consumption
 - Renewable energy consumption (Gigajoules)
 - Non-renewable energy consumption (Gigajoules)
- Water consumption
 - m³ (cubic metres)
- Air emission
 - tonnes
- Waste
 - Recycled (tonnes)
 - Incinerated (tonnes)
 - Landfilled (tonnes)

This is a publicly available example. Use does not imply endorsement.

Example

Best practice

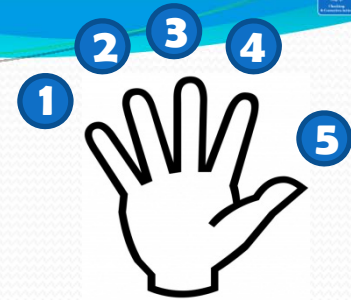
Courtesy of Bureau of International Recycling

Top 10 audit deficiencies under EPSC's Recycler Qualification Program

1. Submission of a deficient application
2. Internal conformance audit was not conducted
3. Regulatory requirements have not been identified
4. A detailed risk assessment has not been completed
5. Procedures lack sufficient detail or clear direction
6. Corrective actions with no root cause analysis
7. Reliance on other "certification" programs
8. Lack of education, training & understanding
9. Lack of downstream accountability
10. Lack of accountability & transparency



Key take away messages:



1. **Top level buy-in & organizational support is essential to achieve ESM**
2. **EHS Policy identifies goals against which to judge all future actions**
3. **EHS Management Systems adopt the “Plan, Do, Check, Act model”**
4. **EHS Management Systems work to address hazards & risks**
5. **EHS Management Systems foster systematic & continual improvement**



Many e-processing standards integrate key principles of EHS management

- Some examples include:

- ✓ EPSC Recycler Qualification Program (CANADA)
<http://rqp.ca>
- ✓ EPRA Electronics Reuse & Refurbishing Program (CANADA)
<http://rqp.ca>
- ✓ Ontario WEEE Reuse and Refurbishment Standard (CANADA)
www.ontarioelectronicstewardship.ca/your-role/service-provider/tools-resources
- ✓ R2/RIOS™ Certification Process (USA/international)
www.r2certification.info/r2-documents
- ✓ E-Stewards Standard (USA/international)
[www.e-stewards.org/files/standard/eStewards Standard Review Version.pdf](http://www.e-stewards.org/files/standard/eStewards%20Standard%20Review%20Version.pdf)
- ✓ *Washington State Environmentally Sound Management & Performance Standards for Direct Processors (USA)*
www.ecy.wa.gov/programs/swfa/eproductrecycle/processor.html





Cảm ơn
Thank you!