



2016

# ES & EL ENGINEERING Environmental Management System (EMS) Version 1.0



**Sedick Kamaldien**

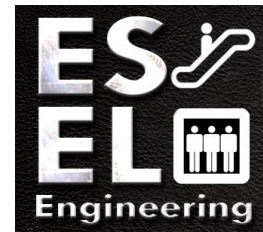
Director

6/11/2016



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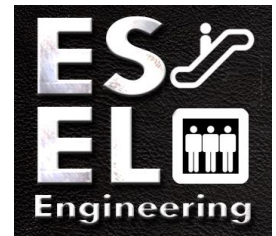
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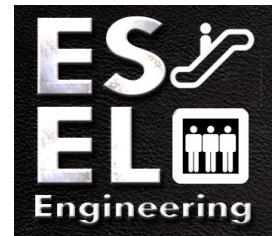
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## Purpose of This Manual

The purpose of this manual is to serve as a high-level "road map" to ES & EL Engineering EMS and to house the procedures which ES & EL Engineering follows in implementing and maintaining its EMS.

This manual and subsequent revisions is distributed by the EMS coordinator to senior management, including the EMS management representative and the EMS committee. It will be made available to all ES & EL Engineering employees, especially those involved in performing work related to the EMS.

This manual also serves as the basis for ES & EL Engineering internal assessment of its EMS.

## Definitions Abbreviations and List of Procedures

### Definitions

**Design for the Environment (DfE):** An approach to incorporating opportunities for risk reduction and wise resource use into business decision-making, developed through partnerships between all South African Environmental Protection Agencies and industry, academic and other stakeholders.

**Environmental aspect (EA):** An element of ES & EL Engineering activities, products, or services that can or does interact with the environment.

**Environmental impact:** Any change to the environment, whether adverse or beneficial, resulting from ES & EL Engineering activities, products, or services.

**Significant environmental aspect (SEA):** An environmental aspect deemed by ES & EL Engineering as having, or potentially having, a significant impact on the environment.

**Alternatives evaluation:** Process by which alternative methods for completing a particular function are evaluated using business and environmental criteria.

**Non-conformity:** Discrepancy between ES & EL Engineering's actual EMS activities and the procedures laid out in this manual (i.e., where the actual activities do not follow the procedures).

**Indicator:** A measurable parameter or predictor of performance (in this case, of environmental performance).

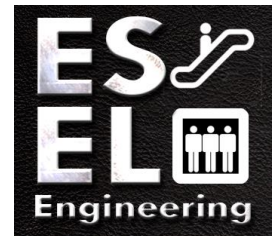
**Root cause analysis:** Systematic process to uncover underlying causes of a particular issue or problem.

## Abbreviations

- DfE** - Design for the Environment
- EA** - Environmental Aspect
- EMS** - Environmental Management System
- SEA** - Significant Environmental Aspect

## List of Procedures

- P-AE** - Conducting an Alternatives Evaluation
- P-CA** - Conducting a Compliance Assessment
- P-CS** - Communication with Stakeholders
- P-D** - Documentation and Document Control
- P-EA** - Identification of Environmental Aspects
- P-EP** - Emergency Preparedness



- P-ET** - Environmental Training (Awareness and Task-Specific)
- P-IA** - Conducting an Internal Assessment
- P-LR** - Identification of Legal Requirements
- P-MR** - Management Review
- P-NPP** - Review of New Purchases, Processes, and Products
- P-OC** - Development of Operational Controls
- P-OTP** - Development of Objectives, Targets and Action Plans
- P-SEA** - Identification of Significant Environmental Aspects
- P-TCA** - Taking Corrective Action

## Company Description

ES & EL Engineering was born out of the collective experience and expertise of certain individuals. It was established in 2015 to assist organizations (public sector, parastatals and private businesses) to realize the opportunities inherent in general engineering consulting and maintenance services of escalators and elevators in the Cape Metropolitan area. We have experience in designing and implementing excellent business solutions for the above sectors.

## Introduction and Scope

ES & EL Engineering has developed and is maintaining an EMS in order to ensure that we continue to supply high quality products and services to our customers while providing a safe, healthy workplace for our employees and acting as a responsible member of our community. The ES & EL Engineering EMS is designed to help us understand our environmental impacts and through proactive management, reduce the risks that our productive operations pose to our employees and to the environment.

The EMS is also the means through which we follow through on the commitments expressed in our environmental policy.





## Scope of ES & EL Engineering's EMS

ES & EL Engineering's EMS presently covers all projects, products and services. More specifically, the EMS covers all operations occurring on-site at the customer's premises, from the point of entry of raw materials and energy to the point of exit of completed projects and services. In addition to projects, products and services processes and activities, all on-site ancillary operations fall within the scope of the EMS, including maintenance, grounds keeping, offices and the activities of on-site contractors and sub-contractors.

The EMS excludes the environmental aspects of products to the extent that ES & EL Engineering does not have influence over their design or disposition. The EMS does take waste disposal into account in evaluating the environmental impacts of on-site activities, even though ES & EL Engineering may not ultimately be the final disposer of its waste.

## Environmental Policy

The core of ES & EL Engineering's EMS is our environmental policy. The environmental policy states in broad terms the principal environmental commitments of ES & EL Engineering. It is signed by the Director and has been communicated to all employees. The environmental policy is posted on bulletin boards throughout the workplace and is available on request to the public, customers and authorities. The EMS coordinator is responsible for ensuring that only the most recent version of the environmental policy is posted and available.

The environmental policy of ES & EL Engineering is reproduced below: -

### Environmental Policy

ES & EL Engineering and Suppliers are committed to providing a quality service in a manner that ensures a safe and healthy workplace for our employees and minimises our potential impact on the environment. We will operate in compliance with all relevant environmental legislation and we will strive to use pollution prevention and environmental best practices in all we do.

ES & EL Engineering and Suppliers will: -

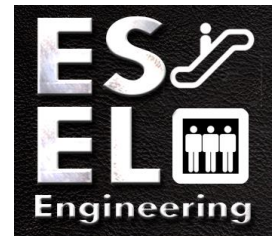
- ✚ Integrate the consideration of environmental concerns and impacts into all of our decision making and activities,
- ✚ Promote environmental awareness among our employees and encourage them to work in an environmentally responsible manner,

- ✚ Train, educate and inform our employees about environmental issues that may affect their work,
- ✚ Reduce waste through re-use and recycling and by purchasing recycled, recyclable or re-furnished products and materials where these alternatives are available, economical and suitable,
- ✚ Promote efficient use of materials and resources throughout our facility including water, electricity, raw materials and other resources, particularly those that are non-renewable,
- ✚ Avoid unnecessary use of hazardous materials and products, seek substitutions when feasible, and take all reasonable steps to protect human health and the environment when such materials must be used, stored and disposed of,
- ✚ Purchase and use environmentally responsible products accordingly,
- ✚ Where required by legislation or where significant health, safety or environmental hazards exist, develop and maintain appropriate emergency and spill response programmes,
- ✚ Communicate our environmental commitment to clients, customers and the public and encourage them to support it,
- ✚ Strive to continually improve our environmental performance and minimise the social impact and damage of activities by periodically reviewing our environmental policy in light of our current and planned future activities.

## EMS Responsibilities

ES & EL Engineering has established an EMS management representative, coordinator and committee with the following responsibilities: -

- ✚ **Management representative** - The EMS management representative is the member of ES & EL Engineering's top project management group responsible for the functioning of the EMS. It is his/her job to ensure that all tasks relating to the EMS are identified and completed in a timely manner. He/she is also responsible for reporting periodically to the top project management group on the progress and results of the EMS.
- ✚ **Coordinator** - The EMS coordinator's responsibility is to identify, assign, schedule, provide the necessary support for and ensure completion of all tasks relating to the EMS. The coordinator works closely with the management representative and with the committee. The EMS coordinator is also responsible for maintaining this manual, under the leadership of the management representative. The junctions of coordinator and management representative may be filled by the same person.
- ✚ **Committee** - The EMS committee, which also serves as the project safety committee, is comprised of 2-4 supervisors and employees. The committee is responsible for ensuring that EMS activities in all projects are carried out and for reporting the results of these activities to the committee as a whole. In addition, the committee



itself undertakes certain EMS activities such as the selection of significant environmental aspects. The committee meets to discuss the EMS on at least a monthly basis.

- ✚ **Records** - The EMS coordinator maintains an updated list of management representative, coordinator and committee members using format RESP-01 (EMS Responsibilities).

## RESP-01: EMS Responsibilities

The following table lists the ES & EL Engineering's EMS management representative, coordinator and committee: -

EMS Function	Name	Regular Position
Management representative		
EMS Coordinator		
EMS Committee		

Contact person:

Date completed:

## EMS Components Procedures and Documentation

The following pages of this manual present the components of ES & EL Engineering's EMS and procedures by which these components are carried out. The following elements are included for each component: -

- ✚ A statement of the purpose of the component. In other words, how the activity fits into the EMS.

- ✚ Chronologically ordered and numbered steps that make up the procedure for carrying out the component. These steps describe what actions are taken and who is responsible and make reference to records or documentation (e.g., formats) where appropriate.
- ✚ Mention of the frequency with which the procedure is carried out.
- ✚ Summary list of records referenced in the procedure and person(s) responsible for maintaining them.

## Identification of Environmental Aspects (P-EA)

### Purpose

In order to understand and manage its actual and potential environmental impacts, ES & EL Engineering identifies the environmental aspects of its project activities, products and services as they fall within the scope of the EMS. As a subset of this activity, ES & EL Engineering identifies the health and environmental concerns related to particular chemicals used in all projects, products and services.

### Procedure

1. Using processing mapping (or input/output flow charts), the EMS committee identifies the basic operations that fall within the scope of the EMS. These are recorded using format EA-01a, with supporting material flow diagrams and table using format EA-01b.
2. The EMS coordinator arranges for the environmental aspects of these operations to be identified by a team of several employees from the operation in question, using the process mapping approach where feasible and under the oversight of the EMS coordinator or a committee member where appropriate.
3. Environmental aspects and their actual or potential impacts (quantified to the extent possible), are listed by operation using format EA-02.

4. If the environmental aspect involves use of a potentially harmful chemical, the EMS committee is responsible for researching the known health and environmental concerns and listing these using format EA-03.

## Frequency

This procedure is repeated annually to ensure that any new environmental aspects are identified.

## Records

Formats EA-01a and EA-01b (Basic and Supporting Operations, Flow Diagrams), EA-02 (Environmental Aspects), and EA-03 (Health and Environmental Concerns) are maintained by the EMS coordinator.

# EA-01a: Basic and Supporting Operations

The following are the basic and supporting operations that fall within the scope of ES & EL Engineering's EMS: -

1. Investigate and understand root causes for issues in business operations.
2. Develop corrective actions to solve the operations issues.
3. Provide consulting services to solve operations engineering problems.
4. Ensure operations related activities are performed in compliance with company standards and regulations.
5. Initiate continuous process improvements to improve operational effectiveness.
6. Identify and implement cost optimization and reduction initiatives.
7. Provide technical support and guidance on operations validation, development and implementation.
8. Provide engineering support to operations team in achieving business goals.
9. Support the start-up and integration of new operations projects.

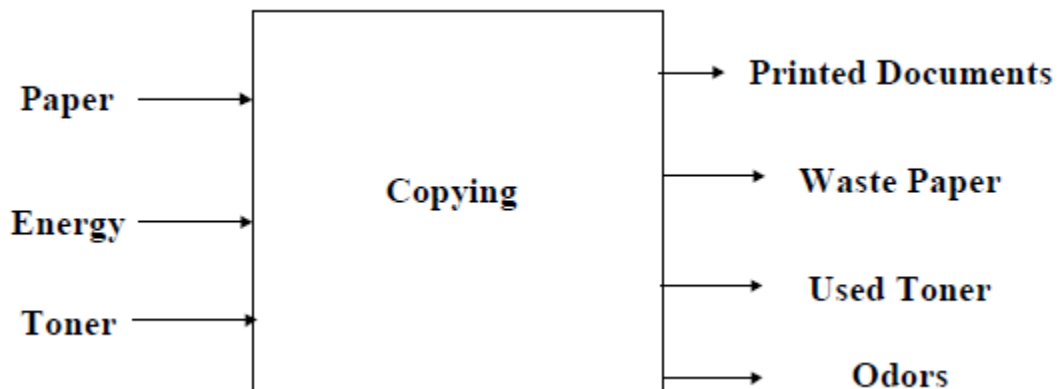
10. Assist in the development and maintenance of operational standards and procedures.

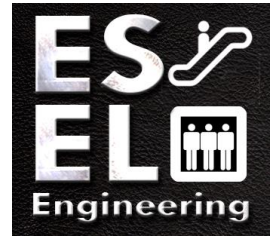
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Date Completed:

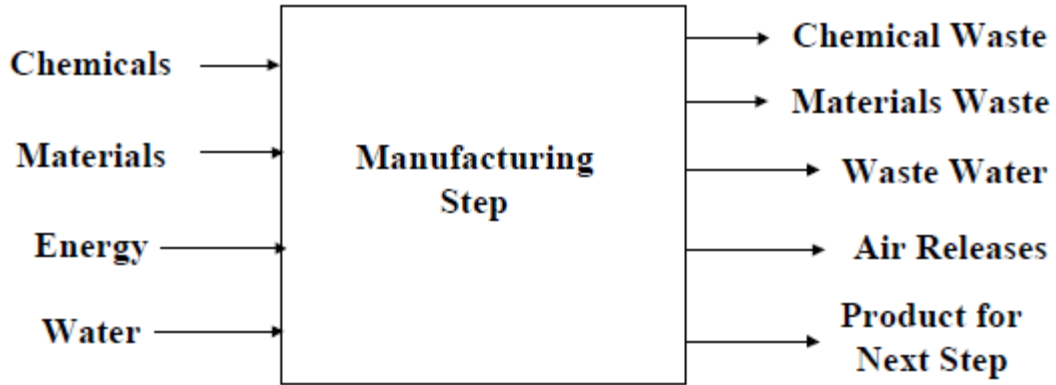
## EA-01b: Basic and Supporting Operations - Material Flow Diagrams

### Generic Input-Output Diagram for Office Operations

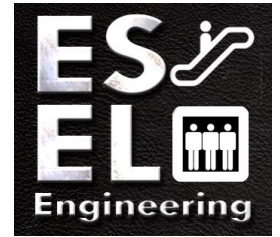




## Generic Input/Output Diagram for a Manufacturing Operation



Product or Services	Component Parts



## EA-02: Environmental Aspects

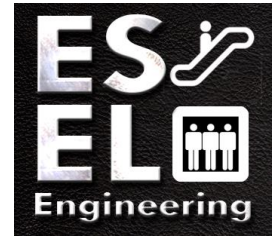
The environmental aspects of the basic and supporting operations identified in format EA-01 are listed in the following table.

Operation	Input/Output	Environmental Aspect	Environmental Impact

Contact Person:

Date Completed:





# EA-03: Health Safety and Potential Environmental Concerns

Work Activity /Chemical	Environmental Aspect	Information Source	Regulatory Data				Human Health Effects by Pathways Acute & Chronic			Effects on Wildlife or Other Environmental Effects				Rank	
			Carcinogen?	OHASA Permissible Exposure Limit	Volatile Organic Compound (VOC)?	Toxic Release Inventory (TRI)?	Inhalation	Dermal	Ingestion	Air	Water	Land	Safety Concerns	Human	Environment

Contact Person:

Date Completed:



## EA-04: Exposure to Chemicals and Materials

Operation	Aspect	Quantity Used per Time Period	Exposure Time		Personal Protective Equipment	Pathway		Rank Exposed Groups		
			Duration	Frequency		Human (Inhalation, Dermal, Oral)	Environmental (Air, Water, Land)	Workers	Community	Environment

Contact Person:

Date Completed:

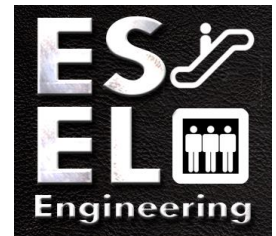
## Identification of Legal Requirements (P-LR)

### Purpose

ES & EL Engineering is committed to complying with all applicable environmental regulations. This procedure describes how ES & EL Engineering identifies applicable regulations.

### Procedure

1. The EMS management representative is responsible for tracking applicable environmental laws and regulations and evaluating their potential impact on the company's operations. He/she employs several techniques to track, identify and evaluate applicable laws and regulations. These techniques include commercial



databases, information from the trade association, direct communication with national and state regulatory agencies and periodic refresher training on environmental laws.

2. As necessary, the management representative may call upon off-site resources such as consultants or attorneys.
3. The management representative compiles and maintains updated copies of applicable environmental laws and regulations.
4. The management representative, working with the EMS coordinator and committee, correlate these regulations to the business activities and environmental aspects associated with them using format LR-01.

## Frequency

Periodic: depends on information source.

## Records

Format LR-01 (Applicable Legal Requirements) is maintained by the EMS coordinator. The EMS management representative maintains copies of the applicable regulations.

# LR-01: Applicable Legal Requirements

The following table provides a list of environmental regulations that apply to ES & EL Engineering's activities. The specific operation(s) to which each regulation applies are also shown. The operations are a subset of those listed on format EA-02.

Regulatory Agency	Regulation & Specific Provision	Operation(s) to Which Provision Applies

Contact Person:

Date Completed:

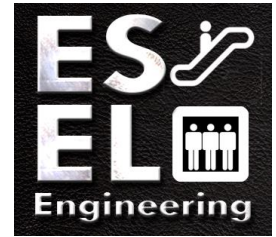
# Identification of Significant Environmental Aspects (P-SEA)

## Purpose

ES & EL Engineering focuses its management efforts on the most significant of its environmental aspects. To determine its SEAs, ES & EL Engineering systematically evaluates its environmental aspects using environmental and business criteria.

## Procedure

1. The EMS coordinator compiles a master list of environmental aspects onto format SEA-01 based on the lists submitted from each area (which are compiled on format EA-02). Where appropriate, individual aspects are grouped. (For example, if consumption of energy is listed as an environmental aspect in several areas, the coordinator could choose to group these listings such that consumption of energy appears just once on the master list).
2. The EMS committee then rates each aspect according to the following criteria: -
  - ✚ Regulatory concerns
  - ✚ Pollution
  - ✚ Risk, including effects of chemicals and materials, impact on workers, impact on the surrounding community, impact on the environment, safety, and noise
  - ✚ Natural resource use
3. Using format SEA-01 aspects are assigned a relative value of L, M-L, M, M-H, or H in each category, where L stands for low impact (or risk, or potential for regulatory issues), M for medium and H for high. Information recorded on formats EA-03 and LR-01 are used to assist the committee in rating each aspect in the categories of risk and regulatory concerns, respectively.
4. A "Total Ranking" is developed for each aspect by adding the scores for each category using the following values: L = 1; M-L = 2; M = 3; M-H = 4; H = 5.
5. With all but the last column of format SEA-01 complete, the committee makes a final determination as to which aspects are significant. As a general guide, the aspects that score the highest number of points are considered significant. The committee, however, should use its best judgement in determining significance.
6. Aspects identified as significant are indicated on format SEA-01.
7. At this point, the EMS committee may take an initial cut at developing indicators for



the SEAs (at least one indicator per SEA). These preliminary indicators, which will be reviewed later (see the procedure on operational controls, P-OC), can be noted using format OC-01.

## Frequency

This procedure is repeated on an annual basis.

## Records

Format SEA-01 (Determining Significant Environmental Aspects) is maintained by the EMS coordinator.

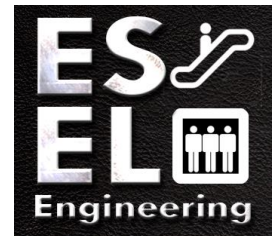
# SEA-01: Determining Significant Environmental Aspects

The following table shows the EMS committee's evaluation of the ES & EL Engineering's environmental aspects based on selected criteria. Those aspects chosen as significant are indicated in the final column.

Operation	Aspect	Regulatory Concern	Chemical & Material Risk-Effects & Exposure			Work Safety	Community Issues	Natural Resources	Overall Ranking	Significant?
			Worker	Community	Environmental					

Contact Person:

Date Completed:



# Development of Objectives Targets and Action Plans (P-OTP)

## Purpose

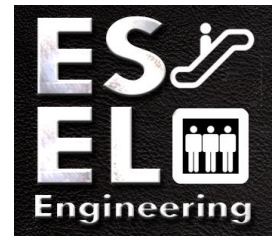
ES & EL Engineering sets objectives for environmental improvement and develops targets and action plans to meet those objectives. These objectives are generally directly related to the company's significant environmental aspects and follow from its environmental policy commitments.

## Procedure

1. Top project management sets environmental objectives for ES & EL Engineering such that the project has one or more environmental objectives at any one time. The current environmental objectives are recorded using format OTP-01. Where possible, environmental objectives are quantified and at least one indicator developed.
2. The EMS committee is responsible for developing and recommending potential new environmental objectives to top management. In identifying potential new objectives, the committee considers the following:
  - ✚ Environmental policy
  - ✚ The SEAs of the company, considering especially those SEAs that pose chemical risk
  - ✚ Applicable laws and regulations and potential future laws and regulations
  - ✚ Practical business criteria, such as the potential costs and benefits of pursuing a particular environmental objective
  - ✚ The views of employees and other interested parties
3. Once environmental objectives are established by top management, the EMS coordinator assigns responsibility (to the manager of the operations in question, where appropriate) for developing targets and action plans to realize the objectives. The targets and action plan that correspond to each objective are recorded by the responsible person using format OTP-02. Sometimes, this may require an alternatives evaluation as the first target (or action item). See P-AE, "Conducting an Alternatives Evaluation," for more detail.

## Frequency

Environmental objectives are reviewed on a yearly basis. The targets and action plans are developed and revised as needed by the committee.



## Records

Environmental objectives are recorded using format OTP-01 (Environmental Objectives), and the targets and action plans that correspond to each objective are recorded using format OTP-02 (Action Plan). The EMS coordinator is responsible for maintaining these records.

# OTP-01: Environmental Objectives

The following is a template of ES & EL Engineering's environmental objectives.

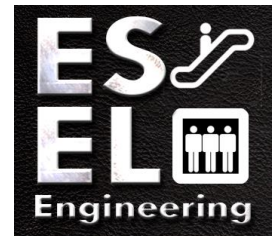
Objective	Related SEA	Related Environmental Policy Provision	Performance Measurement Indicator

Contact Person:

Date Completed:

# OTP-02: Environmental Management Plan

<b>Objective</b>	
<b>Indicator(s)</b>	
<i>Target #1</i>	
Action Plan	
Person Responsible	
Budget	
Schedule	
Review Cycle	
<i>Target #2</i>	
Action Plan	
Person Responsible	
Budget	
Schedule	



Review Cycle	
<i>Target #3</i>	
Action Plan	
Person Responsible	
Budget	
Schedule	
Review Cycle	

Contact Person:

Date Completed:

## Conducting an Alternatives Evaluation (P-AE)

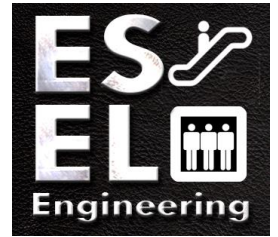
### Purpose

ES & EL Engineering periodically conducts an alternative evaluation to identify viable approaches to reaching an environmental objective. An alternative evaluation is a tool for identifying alternative products and/or processes and evaluating them compared to the baseline based on business and environmental criteria.

### Procedure

1. The EMS coordinator appoints a small group, overseen by a committee member or by the relevant operations manager, to identify and evaluate alternatives to a particular activity or process where an alternative evaluation is required for meeting an environmental objective.
2. The group first identifies the function that this activity or process performs in ES & EL Engineering's operations. The group also characterizes the baseline, or the current manner in which the function is being carried out.
3. The group then brainstorms alternative ways of accomplishing this function. Potential alternatives include using a different material or chemical, changing work practices and/or changing process technologies. Alternatives are recorded using format AE-01 and the most promising alternatives are assigned to individual members of the group for further research.
4. The group then evaluates the baseline and alternatives based on the following considerations: operational performance, cost, regulatory implications and





environmental impact. The group uses formats AE-02 to record its findings and formats AE-03 to AE-06, as needed.

5. The group makes a recommendation and presents its recommendation to the EMS committee and appropriate operations managers.

## Frequency

As often as necessary in the context of developing targets and action plans to meet environmental objectives.

## Records

Formats AE-01 (Alternative Identification) and AE-02 (Evaluation of Alternatives) are maintained by the EMS coordinator, as well as AE-03 to AE-06 to provide, as necessary, supporting documentation.

# AE-01: Alternatives Identification

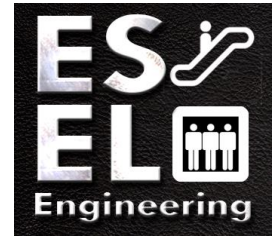
Significant Environmental Aspect(s)

Function:

	Baseline	Potential Alternatives
Products		
Technologies		
Work Practices		
Recycling		
Treatment		
Disposal		

Contact Person:

Date Completed:



# AE-02: Evaluation of Alternatives

Significant Environmental Aspect(s)

Function:

Alternative	Performance	Regulatory Conditions	Cost	Environmental Effects	Overall Evaluation
Baseline					

Contact Person:

Date Completed:

# AE-03: Evaluation of Environmental Effects

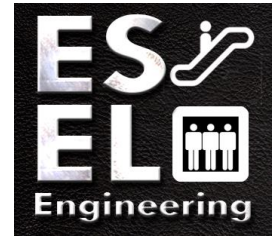
Significant Environmental Aspect(s):

Function:

Alternative	Regulatory Concern	Chemical and Material Risk – Effects and Exposure			Worker Safety	Community Issues	Natural Resources	Overall Ranking	Preferred Alternative? (Yes/No)
		Workers	Community	Environment					

Contact Person:

Date Completed:



## AE-04: Evaluation of Performance

Significant Environmental Aspect(s):

Function:

Alternative	How Well it Works	Time	Ease of Use	Overall Performance Evaluation
Baseline				

Contact Person:

Date Completed:

## AE-05: Evaluation of Regulatory Concerns

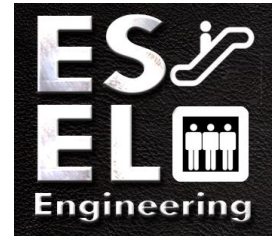
Significant Environmental Aspect(s):

Function:

Alternative	Applicable Regulation	Required Controls	Cost of Compliance	Overall Regulatory Concerns Evaluation
Baseline				

Contact Person:

Date Completed:



## AE-06: Evaluation of Costs

Significant Environmental Aspect(s):

Function:

Alternative	Raw Material	Labour	Disposal	Total Cost	Savings	Net Cost
Baseline						

Contact Person:

Date Completed:

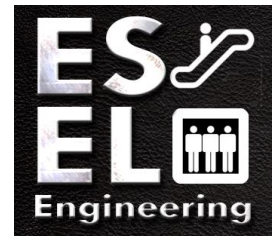
## Development of Operational Controls (P-OC)

### Purpose

By developing operational control procedures for critical activities (i.e., those activities associated with SEAs), ES & EL Engineering intends to mitigate and control, to the extent possible, the environmental impacts associated with its SEAs.

### Procedure

1. The EMS committee, with additional input from other employees as needed, carries out a root cause analysis of each SEA to determine the underlying cause(s) of the environmental impact. As part of the root cause analysis, the committee will determine the need for (and adequacy of, if already existing) operational control procedures to control the critical activities related to the SEA in question and record its findings on format OC-01. The committee, with input from operations managers as needed, will also select one or more indicators per SEA for purposes of monitoring ES & EL Engineering's environmental performance as related to the SEAs.



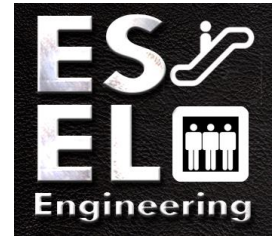
2. Where there is a need to create or modify an operational control procedure, the EMS committee assigns a member of the committee to draft an operational control procedure, based on consultation with the employees who undertake that procedure. In many cases, a separate operational control procedure may not be required, rather the integration of environmental control procedures into an existing procedure. The operational control procedure should take the form of a "Work Instruction," namely a summary list of required steps or measures. In addition to describing the steps necessary to carry out the particular activity in an environmentally sound manner, the work instruction should also include steps to conduct monitoring, where applicable.
3. After the operational control procedure has been developed and implemented, its status is recorded as such on format OC-01. The procedure itself enters into the relevant ES & EL Engineering operator's handbook and/or is posted at the site of the activity in question.

## Frequency

As new SEAs are identified. For existing SEAs, a review of the associated root cause analysis and operational control procedures is conducted yearly.

## Records

Format OC-01 (EMS Operational Control Procedures) is maintained by the EMS coordinator. The procedures themselves are maintained in the relevant ES & EL Engineering operator's handbook and/or posted at the site of the activity in question.



# OC-01: EMS Operational Control Procedures

SEA	Indicator/s	Associated Job Functions	Existing Operational Control Procedures	Operational Control Procedures Development/Modification Needed	Responsible/ Status	Location Posted

Contact Person:

Date Completed:



# Environmental Training (Awareness and Task-Specific) (P-ET)

## Purpose

To ensure that its employees carry out their duties in as environmentally responsible a manner as possible, ES & EL Engineering provides all employees with environmental awareness training on environmental issues and provides task-specific training to those employees whose jobs are associated with significant environmental aspects.

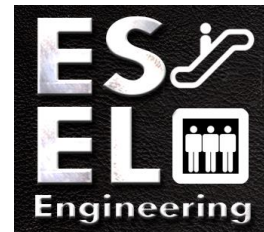
## Procedure

### *Awareness Training*

1. All new employees receive a 15-minute introduction to the ES & EL Engineering's EMS, specifically its environmental policy, significant environmental aspects and environmental objectives. This introduction, which includes an opportunity for the new employees to ask questions about the EMS, is given by the human resources (HR) manager as part of his general orientation for new employees. Records of employees who have received this introduction are maintained by the HR department.
2. Each year employees are invited to a company picnic. One of the scheduled events for this picnic is a 15-minute talk by a member of ES & EL Engineering's EMS implementation committee. This person speaks about the environmental accomplishments of ES & EL Engineering, the state of its EMS and the goals for the coming year. These remarks provide an update to the initial EMS awareness training received by employees.

### *Task-Specific Training*

3. Using the root cause analysis as a tool (see P-OC and format OC-01), the EMS committee, working in coordination with the appropriate operations managers, identifies the job functions that are associated significantly with each SEA.
4. The EMS committee, in conjunction with the relevant operations manager, then determines what training employees performing each of these job functions should receive in order to control actual environmental impacts to the greatest possible extent.



5. Operations managers are responsible for ensuring that their employees receive the appropriate task-specific environmental training. Where possible, environmental training is integrated with other types of training (e.g., operational) that employees are receiving. The HR manager keeps records of the training received by each employee.

## Frequency

Awareness training is given to new employees during their first week at ES & EL Engineering. Task-specific training is given to relevant employees as they take on a new function that is associated with a SEA. Task-specific training is updated, as necessary.

## Records

Records of the awareness and task-specific training received by each employee are kept by the HR manager. The job functions associated with environmentally critical activities (i.e., those functions that should receive task-specific training) are listed on format OC-01.

# Emergency Preparedness (P-EP)

## Purpose

As part of its EMS, ES & EL Engineering strives to ensure that the environmental impacts associated with any emergency situations are minimized to the greatest extent possible.

## Procedure

1. ES & EL Engineering has an Emergency Response Committee charged with identifying potential emergency scenarios and developing and ensuring the implementation of appropriate procedures, should an emergency situation develop.
2. With the assistance of the EMS coordinator, the Emergency Response Committee; (a) identifies the potential negative significant environmental impacts associated with potential emergency scenarios; (b) incorporates measures to minimize these impacts into emergency response procedures; and (c) ensures that adequate training (including simulations) is provided to appropriate staff to implement these procedures.



3. The Emergency Response Committee maintains records of the potential emergency scenarios it is prepared for, the potential environmental impacts associated with each scenario and the procedures established to minimize these impacts. The HR manager keeps records of training received by staff on implementation of emergency response procedures.

## Frequency

The Emergency Response Committee meets quarterly to review the status of its work.

## Records

Records of emergency scenarios, associated potential environmental impacts and procedures to mitigate these impacts are kept by the Emergency Response Committee. Training records are kept by the HR manager.

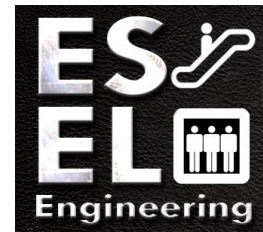
# Review of New Purchases Processes and Products (P-NPPP)

## Purpose

When purchasing new chemical supplies, modifying its processes and making new products, ES & EL Engineering strives to ensure that environmental considerations, particularly those related to SEAs, are taken into account.

## Procedure

1. When processing an order for a new chemical or other potentially harmful input, the purchasing manager clears the purchase with a member of the EMS committee. The EMS committee member initials the box marked "environmental approval" in the New Purchase Approval Form to signify his or her approval of the purchase.
2. ES & EL Engineering has a product development group and facilities engineering group. The product development group develops potential new products that ES & EL Engineering could offer (sometimes these are identified by the sales and



marketing group, sometimes they are identified internally). The facilities engineering group is responsible for reconfiguring.

3. The product development group notifies a member of the EMS committee before final approval of a new product purchase/design. The EMS committee member reviews the design in light of the facility's SEAs and environmental objectives and targets. When the committee member is satisfied that the new purchase/design is in accordance with the environmental goals, he/she initials the appropriate box in the Purchase/Design Approval Form that is sent to the president for approval.
4. The facilities engineering group is responsible for notifying a member of the EMS committee before final approval of any Facility Modification or Expansion Plan. (The Facility Modification or Expansion Plan is required for any facilities engineering job that costs more than R200,000.) The EMS committee member reviews the plan in light of the facility's SEAs and environmental objectives and targets. When the committee member is satisfied that the new design is in accordance with the environmental management goals, he/she initials the appropriate box in the Facility Modification or Expansion Plan form that is sent to the operations manager for ultimate approval.

## Frequency

As new chemicals are purchased, new products are developed and/or production lines are modified.

## Records

The New Purchase Approval Forms are maintained by the purchasing manager. The Design Approval Forms are maintained by the product development group. The Facility Modification or Expansion Plans are maintained by the facilities engineering group.

# Documentation and Document Control (P-D)

## Purpose

To ensure effective operation of the EMS, ES & EL Engineering documents the procedures of its EMS and keeps records of the outcomes of EMS processes and of the important environmental issues facing the company. This EMS manual comprises this documentation. Documentation is kept up-to-date.

## Procedure

1. The EMS coordinator documents the procedures that define ES & EL Engineering's EMS in this manual. The EMS committee formally reviews and if necessary, revises this manual on an annual basis. Revised manuals are assigned a new revision number (a minor set of revisions would change the number from, say, 1.1 to 1.2; a major revision would change the number from, say, 1.1 to 2.0). Finally, the EMS coordinator ensures that no employees or managers use outdated revisions of this manual.
2. The EMS coordinator maintains updated records of the following outcomes, or results, of the functioning of the EMS: -
  - ✚ Environmental policy
  - ✚ Environmental aspects (EA-01, EA-02, EA-03)
  - ✚ Applicability of legal requirements to EAs (LR-01); note that copies of the regulations themselves are maintained by the EMS management representative
  - ✚ Significant environmental aspects (SEA-01)
  - ✚ Objectives, targets, and action plans for environmental management programs (OTP-01, OTP-02)
  - ✚ Results of alternatives evaluations (AE-01, AE-02, AE-03 - AE-06)
  - ✚ List of operational control procedures related to SEAs (OC-01)
  - ✚ Results of internal assessments (IA-01 and IA-02)
  - ✚ Corrective actions taken (TCA-01)
  - ✚ Management reviews (MR-01)

These items are described in more detail in the relevant procedures in this manual.

3. The EMS coordinator is not responsible for maintaining records of environmental training and emergency response preparations; the operational control procedures themselves; or the New Purchase Approval Forms, the Design Approval Forms, or the

4. Facility Expansion or Modification Plans. These records are maintained by the appropriate person or group, as specified in the relevant procedures of this manual.

## Frequency

Manual review and revision on an annual basis.

## Records

Maintained as outlined in the procedure.

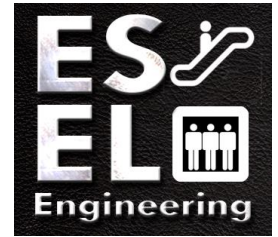
# Conducting a Compliance Assessment (P-CA)

## Purpose

ES & EL Engineering conducts a periodic compliance assessment to ensure that it complies with all applicable local and national environmental regulations.

## Procedure

1. The EMS management representative maintains copies of applicable legal regulations, which are summarized on format LR-01. Based on these regulations, the EMS management representative and coordinator compile a list of questions as a compliance assessment protocol. These questions are intended to be sufficient to the compliance status ES & EL Engineering with respect to applicable environmental regulations (both the paperwork and the performance-related components).
2. The EMS coordinator and another operations manager carry out the assessment by determining and recording the answers to the compliance assessment protocol. When they are done with the compliance assessment, they note any actual or potential compliance issues on format CA-01 (Compliance Tracking Log). Each actual and potential compliance issue is immediately referred to corrective action (see the Taking Corrective Action procedure, P-TCA).



## Frequency

Monthly.

## Records

Compliance assessment results are recorded by the internal assessment team using the compliance assessment protocol and using format CA-01. Records are maintained by the EMS coordinator.

# CA-01: Compliance Tracking Log

Person Responsible	Regulation	Root Cause	Compliance Check Date	Results	Corrective Action/Date (see: TCA-01)	Compliance Verified/ Date

Contact Person:

Date Completed:

# Conducting an Internal Assessment (P-IA)

## Purpose

ES & EL Engineering conducts periodic internal assessments of its EMS to ensure that it is being implemented and operated according to the procedures laid out in this manual.



## Procedure

1. At intervals, a team of two or three operations managers or employees, who are not on the EMS committee, conducts an internal assessment of ES & EL Engineering's EMS. The assessment team uses this manual as the basis for its assessment. In particular, the assessment team checks to make sure that: -
  - ✚ Each procedure is being carried out as stated in this manual
  - ✚ ES & EL Engineering's environmental policy is being upheld
  - ✚ Progress is being made in meeting the environmental objectives

The assessment team bases its evaluation on objective evidence, including documentation and records (e.g., those cited in this manual), interviews with key employees and observations. Note that this is not a compliance audit

2. The assessment team completes the checklist on format IA-01 and writes up its findings using format IA-02. A "major non-conformity" occurs when an EMS procedure is clearly not being implemented, when one of the commitments in the policy is not being upheld, or when no progress is being made in achieving an environmental objective; a "minor nonconformity" occurs when a procedure is being implemented inconsistently, yet without causing major failings in the EMS as a whole.
3. Each non-conformity is immediately referred to corrective action (see the Taking Corrective Action procedure, P-TCA).
4. Records of each assessment (i.e., formats IA-01 and IA-02) are maintained by the EMS coordinator.

## Frequency

At least two times per year.

## Records

Assessment results are recorded by the internal assessment team using formats IA-01 and IA-02 (Internal Assessment Checklist and Internal Assessment Record). Records are maintained by the EMS coordinator.

## IA-01: Internal Assessment Checklist

Internal Assessment Team:

Date of Internal Assessment:

Signed:

### *EMS Procedures:*

Check each item assessed (includes auditing of records, where applicable):

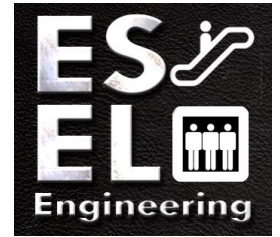
- ✚ Environmental policy (adherence to policy commitments)
- ✚ Environmental objectives (progress; implementation of action plans)
- ✚ EMS responsibilities (RESP-01)
- ✚ Identification of Environmental Aspects (P-EA)
- ✚ Identification of Legal Requirements (P-LR)
- ✚ Identification of Significant Environmental Aspects (P-SEA)
- ✚ Development of Objectives, Targets, and Action Plans (P-OTP)
- ✚ Conducting an Alternatives Evaluation (P-AE)
- ✚ Development of Operational Controls (P-OC)
- ✚ Environmental Training (Awareness and Task-Specific) (P-ET)
- ✚ Emergency Preparedness (P-EP) Review of New Products and Processes (P-NPP)
- ✚ Documentation (P-D)
- ✚ Conducting a Compliance Assessment (P-CA)
- ✚ Conducting an Internal Assessment (P-IA)
- ✚ Taking Corrective Action (P-TCA)
- ✚ Management Review (P-MR)

### *EMS Performance*

- ✚ Achieved objective #1
- ✚ Achieved objective #2
- ✚ Achieved objective #3

Contact Person:

Date Completed:



## IA-02: Internal Assessment Record

Internal Assessment Team	
Date of Internal Assessment	
Signed	
<i>Major Non-Conformities Observed</i>	
1.	
2.	
3.	
<i>Minor Non-Conformities Observed</i>	
1.	
2.	
3.	
Is ES & EL Engineering making progress in meeting its EMS objectives?	
Is ES & EL Engineering adhering to the commitments in its environmental policy?	
Suggestions for Improving the EMS	

Contact Person:

Date Completed:



# Taking Corrective Action (P-TCA)

## Purpose

ES & EL Engineering uses a formal corrective action process to ensure that actual or potential compliance issues and EMS non-conformities are addressed quickly and effectively.

## Procedure

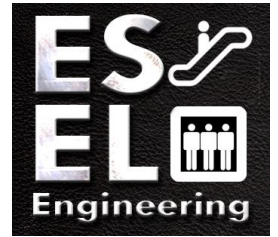
1. The management representative assigns responsibility for taking action to correct each actual or potential compliance issue or non-conformity identified in a compliance assessment or an internal assessment (see P-CA and P-IA, respectively) to an appropriate manager or employee. Together they fill out the "Statement of the Problem" part of the Corrective Action Notice.
2. The person responsible then undertakes the corrective action required, calling upon the management representative, the EMS committee and others for assistance as necessary.
3. The responsible person and the management representative fill out the "Completion of Corrective Action" part of the Corrective Action Notice when corrective action is complete.

## Frequency

Whenever significant problems in the functioning of the EMS are identified, primarily through the internal assessment process.

## Records

Corrective action is recorded using format TCA-01; records are maintained by the EMS coordinator.



## TCA-01: Corrective Action Form

<i>Statement of the problem</i>
Date
Description of non-conformity or actual or potential compliance issue
Description of potential solution
Person responsible for corrective action
Deadline for completion of corrective action
<i>Completion of Corrective Action</i>
Actions Taken
Results
Date

Signed:

\_\_\_\_\_ Management Representative

\_\_\_\_\_ Person Responsible

# Communication with Stakeholders (P-CS)

## Purpose

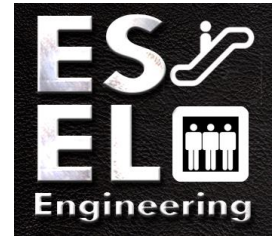
To ensure that interested external stakeholders receive appropriate information about the company's environmental activities, ES & EL Engineering has developed a company policy for considering and where appropriate, responding to queries, comments, or complaints from stakeholders.

## Procedure

1. The EMS committee identifies stakeholders and their potential interests in the environmental performance of ES & EL Engineering using format CS-01, Stakeholders and Environmental Issues. If the committee decides that proactive communication on environmental issues is necessary with any group, that decision is recorded on CS-01 and responsibility is designated.
2. When any form of communication is received regarding ES & EL Engineering's environmental performance or management from a stakeholder, that communication is immediately forwarded to the EMS management representative.
3. The EMS management representative considers the nature of the communication and makes a decision on whether and how to respond to it based on the guidance below and on the more specific guidance in CS-01. The EMS management representative is responsible for maintaining records of each such communication and response using format CS-02, Stakeholder Communication Record. Where internal actions are necessary to address the communication, this is noted on CS-02 and a Corrective Action Form (TCA-01) is initiated.

### *Guidance for Communicating with Stakeholders on Environmental Issues:*

ES & EL Engineering's environmental policy is available to all stakeholders upon request. ES & EL Engineering will do its best, however, to respond in kind to all good-faith communications from stakeholders about environmental issues, including complaints, comments and information requests. However, ES & EL Engineering may not choose to respond in all cases, particularly if the request is made in bad faith or if sensitive information is requested.



## Frequency

As per environmental communication.

## Records

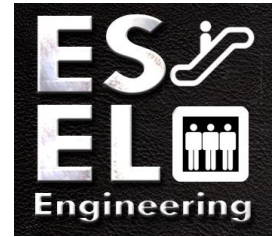
Records of environmental communications from stakeholders and ES & EL Engineering's responses are kept by the EMS management representative and are tracked using format CS-02. An updated version of CS-01, Stakeholders and Environmental Issues, is kept in this manual.

# CS-01: Stakeholders and Environmental Issues

Stakeholder	Potential Environmental Interest	Proactive Communication Plan	Person Responsible

Contact Person:

Date Completed:



## CS-02: Stakeholder Communication Record

<i>Date Communication Received</i>	
<i>Type of Communication</i>	
<i>Received from</i>	
<i>Address/Tel Number/Email</i>	
<i>Content of Communication (attach copy if possible)</i>	
<i>ES &amp; EL Engineering Respond?</i>	YES <span style="margin-left: 150px;">NO</span>
<i>Date of Response</i>	
<i>Person Responding</i>	
<i>Position</i>	
<i>Nature of Response (attach copy if possible)</i>	
<i>Are Internal Actions Necessary? (If Yes, fill out a Corrective Action Form)</i>	

Contact Person:

Date Completed:

# Management Review (P-MR)

## Purpose

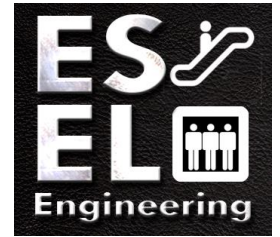
To ensure the effectiveness of the EMS and its continual improvement, ES & EL Engineering top management periodically reviews the important elements and outcomes of the EMS.

## Procedure

1. In preparation for the management review, the EMS management representative gathers the following information and makes it available to top management, including the owner of ES & EL Engineering and the project manager: -
  - ✚ Environmental policy
  - ✚ List of EMS committee and others responsible for major parts of the EMS (RESP-01)
  - ✚ List of significant environmental aspects and criteria of significance (SEA-01)
  - ✚ Update on compliance status of the company and on any potential upcoming regulations that might require an advance strategy
  - ✚ List of environmental objectives and targets (OTP-01 and OTP-02)
  - ✚ Environmental performance results (from monitoring and measuring SEA indicators and indicators of progress toward environmental objectives and targets)
  - ✚ Bullet-point description of other accomplishments of the EMS (e.g., number of people trained, etc.)
  - ✚ Results of most recent EMS internal assessment (IA-02), compliance assessment (CA-01), and corrective actions taken
  - ✚ Description and documentation of feedback from stakeholders (if received)
  - ✚ Analysis of the costs and benefits of the EMS (as quantitative as possible)
2. Top management meets to review and discuss the information presented. The EMS management representative and coordinator will also be present. Depending on its review, top management may direct specific and/or significant changes in the scale and direction of the EMS in order to improve its effectiveness and business value. The conclusions and directives that result from the management review are recorded using format MR-01 and kept by the EMS coordinator.

## Frequency

Quarterly.



## Records

Results of management reviews are recorded using format MR-01. Records are kept by the EMS coordinator.

# MR-01: Management Review Record

Date of review meeting	
Persons present at meeting	
Name	Position
Conclusions	
Actions to be taken	Person/s responsible

Signed:

\_\_\_\_\_

Management Representative

\_\_\_\_\_

Project Manger