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Hazard Analysis

(mo/yr)

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ISO 14001 Reference: 4.3.1

1.0 Background

Operation Analysis and Identification of Products, Activities and Services (PAS)

The organization shall establish and maintain (a) procedure(s) to identify the Hazard Analysis of its products, activities or services that it can control and over which it can be expected to have an influence to determine those which have or can have significant impact on employees, the environment, property, resources and products. The organization shall ensure that the Hazard Analysis related to these significant impacts are considered in setting its objectives. The organization shall keep this information up-to-date.

2.0 Requirements

The identification of the organization's Hazard Analysis is a key element of the EHS System as these determine those issues and areas that should be the primary focus for monitoring, control and improvement.

Each functional area's products, activities and services (PAS) will be evaluated and scored according to their impact on EHS elements. An impact can be defined as an effect between each functional area's PAS on any one of the following EHS elements: employee health and safety, environment, property, resources and products.

If the PAS impact scores above the significance level, that PAS will be deemed a hazard for that impact.

Hazard Analysis includes activities under the site's control and influence and include a broader spectrum of issues including employee health and safety, depletion of natural resources, energy and water use, product-related issues and issues associated with suppliers, contractors and vendors.

3.0 Scope

This procedure applies to the Hazard Analysis of the products, activities and services that can be controlled or influenced relative to manufacturing and support operations.

4.0 Objective

The purpose of this procedure is to evaluate each functional area's PAS according to the EHS elements of employee health and safety, environment, property, resources and products at a site. Procedures must be established to determine the significance cut off level.

4.1 Identification of Impacts

Once the Hazard Analysis review team has successfully identified all of the site's functional areas and their associated PAS, the team will identify the impacts for each PAS. The team will complete a separate worksheet for each product, activity and service within a given functional area. The worksheet follows the impact categories which relate the EHS elements:

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

In the following tables, a guidance list of potential "issues" for each EHS element impact is provided to ensure a full evaluation of all potential impacts. The team should consider all of the following in identifying the potential impacts:

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EMPLOYEE HEALTH & SAFETY ELEMENT	
PHYSICAL HAZARDS IMPACT ISSUES	HEALTH HAZARDS IMPACT ISSUES
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

ENVIRONMENTAL ELEMENT			
AIR QUALITY IMPACT ISSUES	SOLID & HAZARDOUS WASTES IMPACT ISSUES	WATER QUALITY IMPACT ISSUES	LAND USE IMPACT ISSUES
Hoods, vents, stacks Fugitive emissions	General trash Landscaping and yard waste	Sanitary Wastewater Storm water	Erosion and sedimentation Natural resources
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

PROPERTY ELEMENT		
BUILDING & OPERATIONS IMPACT ISSUES	SECURITY IMPACT ISSUES	SPILL & RELEASE IMPACT ISSUES
Fire Protection	Grounds Security	Soil contamination
[REDACTED]		[REDACTED]

RESOURCE IMPACTS	
CONSUMPTION ISSUES	SCRAP ISSUES
Natural resource depletion [REDACTED]	Recycle ability [REDACTED]

PRODUCT IMPACTS		
PRODUCT END USE ISSUES	PRODUCT CONTENT ISSUES	PROCDUCT PACKAGING ISSUES
Consumer end use [REDACTED]	Toxicity [REDACTED]	Packaging Materials [REDACTED]

This process requires consideration of the impacts of the EHS elements for each PAS. Worksheet QC-118-1 herein should [REDACTED]

[REDACTED] For example, air quality, water quality, solid and hazardous waste and land use are [REDACTED]

[REDACTED] The Hazard Analysis Review Team should use their best judgment regarding [REDACTED]

4.2 Significance Analysis

After the PAS impacts have been identified for each of the EHS elements (*employee health and safety, the environment, property, resources and products*) the significance ranking process is the next step to be completed using the same Hazard Analysis Worksheet. This is a six-step procedure that will evaluate and score each impact according to the following criteria: frequency, severity, scale, legal/regulatory, degree of control and stakeholder concerns. Section 4.3 has a brief description on how to score the aforementioned criteria based on the EHS element being evaluated.

4.2.1 [REDACTED]

4.2.2 [REDACTED]

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[Redacted]

4.3 Analysis Scoring by Element

The Hazard Analysis Review Team, in consultation with other facility personnel as appropriate, will

[Redacted]

4.4 Employee Health & Safety

4.4.1 **Frequency or likelihood of occurrence of the impact** – defined as the possibility of occurrence of safety related employee accidents or incidents or the frequency of employee accidents occurring in this PAS compared to the facility as a whole. Another point of view for this evaluation would be [Redacted] which would rate a "5" in situations where the job tasks in the PAS area seldom or never pose a risk, which would rate a "1".

Frequency or Likelihood of Occurrence of the Impact	
1	[Redacted]
2	[Redacted]
3	[Redacted]
4	[Redacted]
5	[Redacted]

4.4.2 **Severity of the impact** – defined as the actual or potential safety risks or seriousness of an employee accident that may or has occurred in this PAS. This may require reviewing the accident logs to determine if accidents in this area required minor first aid or has a history of loss time accidents.

Severity of the Impact	
1	[Redacted]
2	[Redacted]
3	[Redacted]
4	[Redacted]
5	[Redacted]

4.4.3 **Scale of use of the impact** – defined as the actual or potential scale (e.g., size, volume, magnitude) of the resulting employee safety impact. This should be evaluated as to the number of employees that work in the PAS compared to the facility. Obviously, the more employees that work in any given PAS will

[Redacted]

Scale of Use of the Impact	
1	[Redacted]
2	[Redacted]
3	[Redacted]
4	[Redacted]
5	[Redacted]

4.4.4 **Legal or regulatory concern** – defined as regulatory exposure of employee safety as related to applicable federal, state, and local laws. If the PAS is subject to general safety regulations, the rating would be a "2". If the area were subject specific regulations such as [REDACTED]

Examples of specific regulations include:

SPECIFIC SAFETY MANAGEMENT PROGRAMS		
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

Legal or Regulatory Concern of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.4.5 **Degree of control or influence of the impact**– defined as the level of control that the site has over employee health and safety. The thought process for this evaluation involves whether the facility puts forth effort to control the safety risk and how effective are these controls in preventing accidents, not just complying with a regulation. For instance, [REDACTED]

Degree of Control or Influence of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.4.6 **Stakeholder concern of the impact** – defined as the actual or potential risk of the PAS to its employees and the surrounding community as perceived by internal or external groups.

Stakeholder Concern of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

The Hazard Analysis Review Team ranks the significance of each employee safety impact for each PAS according to the above criteria and scoring system using the Worksheet provided with this procedure. The total

significance ranking for each PAS is derived from [REDACTED]

4.5 Environment

4.5.1 **Frequency or likelihood of occurrence of the impact** – defined as the possibility of occurrence of the environmental impact, the number of times the impact occurs and/or the duration of each occurrence. All impacts should be evaluated from a time viewpoint for usage and production. For the environmental areas of air quality, water quality and solid/hazardous waste, this evaluation is based on [REDACTED]

Frequency or Likelihood of Occurrence of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

Severity of the impact – defined as the actual or potential severity of the resulting environmental impact (e.g., toxicity, duration of impact, ability to migrate and cleanup, etc.) in terms of its damage to the environment (air, water, land, soil and groundwater).

Severity of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.5.2 **Scale of use of the impact** – defined as the actual or potential scale (e.g., size, volume, magnitude) of the resulting environmental impact.

Scale of Use of the Impact	
1	Inconsequential use or discharge
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.5.3 **Legal or regulatory concern of the impact** – defined as regulatory exposure of the PAS related to applicable federal, state, and local environmental laws (including regulations, permit conditions) as well as Corporate or “other” standards.

Legal or Regulatory Concern of the Impact	
1	Not regulated
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	Violates regulatory requirements or permit conditions

4.5.4 **Degree of control or influence of the impact** – defined as the level of control that the site has over the environmental aspect. In general, environmental aspects generated from site activities are considered

under the control of the site, and environmental aspects related to suppliers, contractors, vendors, customers, etc. are considered under the site’s influence. The thought process for this evaluation involves

[REDACTED]

Degree of Control or Influence of the Impact	
1	Little or no ability to influence
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	Completely within the site’s control

4.5.5 **Stakeholder concern of the impact** – defined as the actual or potential severity of the environmental impact as perceived by internal or external groups.

Stakeholder Concern of the Impact	
1	[REDACTED]
2	Minor concern, nuisance potential
3	[REDACTED]
4	[REDACTED]
5	Serious concern, reputation at stake

The Review Team ranks the significance of each environmental impact in each PAS according to

[REDACTED]

4.6 Property

4.6.1 **Frequency or likelihood of occurrence of the impact** – defined as the possibility of occurrence of property related or loss control concerns regarding building and operations, security and releases. All impacts should be evaluated from a time viewpoint as to whether loss control is routine for the PAS such as

Frequency or Likelihood of Occurrence of the Impact	
1	Once in a lifetime
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	Continuous

4.6.2 **Severity of the impact** – defined as the actual or potential severity of the resulting in loss (e.g.,

[REDACTED]

Severity of the Impact	
1	No adverse property impact
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	High property impact – results in [REDACTED]

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4.6.3 **Scale of use of the impact** – defined as the actual or potential scale (e.g., size, volume, magnitude) of the financial loss in the PAS due to property damage. Designate a PAS that would have the biggest impact if that operation were lost due to man made or natural disaster as a "5" and lowest as a "1". Extrapolate for other PAS from 1 to 5 accordingly.

Scale of Use of the Impact	
1	Inconsequential use
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	High scale use

4.6.4 **Legal or regulatory concern of the impact** – defined as regulatory exposure from a property standpoint of the PAS, as related to applicable federal, state, and local laws (including regulations, permit conditions) as well as Corporate or "other" standards (insurance carrier).

Legal or Regulatory Concern of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.6.5 **Degree of control or influence of the impact** – defined as the level of control that the site has over the PAS. In general, site activities are considered [REDACTED]

For instance, [REDACTED]

Degree of Control or Influence of the Impact	
1	Little or no ability to influence
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	Completely within the site's control

4.6.6 **Stakeholder concern of the impact** – defined as the actual or potential severity of the resulting impact in terms of loss control (lost production or sales) as perceived by internal or external groups.

Stakeholder Concern of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	Serious concern, insurance rating at stake

The Hazard Analysis Review Team ranks the significance of each property impact in each PAS according to [REDACTED]

4.7 **Resources**

4.7.1 **Frequency or likelihood of occurrence of the impact** – defined as the frequency that raw materials are consumed or scrap is produced in this PAS.

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Frequency or Likelihood of Occurrence of the Impact	
1	[REDACTED]
2	Irregularly or unpredictable - annually or more
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.7.2 **Severity of the impact** – defined as the actual or potential severity of the raw material consumption or scrap generation. Under normal conditions, the team will evaluate the severity of raw materials depletion compared to the total availability of the resource as a whole. Scrap would be viewed as [REDACTED]

Severity of the Impact	
1	No consumption impact
2	[REDACTED]
3	Moderate consumption impact
4	[REDACTED]
5	[REDACTED]

4.7.3 **Scale of use of the impact** –defined as the actual or potential scale (e.g., size, volume, magnitude) of the PAS relating to raw material consumption or scrap generation. Designate a PAS in the facility that is highest raw material consumer or scrap generator as a "5" and extrapolate accordingly for the remaining PAS.

Scale of Use of the Impact	
1	[REDACTED]
2	[REDACTED]
3	[REDACTED]
4	[REDACTED]
5	[REDACTED]

4.7.4 **Legal or regulatory concern** – defined as regulatory exposure of the PAS as it relates to consumption of raw materials applicable to federal, state, and local laws (including regulations, permit conditions) as well as Corporate or "other" standards. For example, [REDACTED]

Legal or Regulatory Concern	
1	Not regulated
2	[REDACTED]
3	Subject to moderate regulatory requirements – e.g., recordkeeping, reporting
4	[REDACTED]
5	[REDACTED]

4.7.5 **Degree of control or influence** – defined as the level of control that the site has over raw material consumption or scrap generation. For raw materials, evaluate whether the facility has any influence over [REDACTED]

Degree of Control or Influence	
1	Little or no ability to influence
2	[REDACTED]

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3	
4	
5	Completely within the site's control

4.7.6 **Stakeholder concern** – defined as the actual or potential severity of the consumption of raw materials or scrap generation as perceived by internal or external groups.

Stakeholder Concern	
1	
2	
3	
4	
5	

The Hazard Analysis Review Team ranks the significance of each resource impact in each PAS according to the above criteria and scoring system using the Worksheet provided with this procedure. The total significance ranking for each PAS is derived from [REDACTED]

4.8 Products

4.8.1 **Frequency or likelihood of occurrence** – defined as the frequency that a final product is produced in this PAS.

Frequency or Likelihood of Occurrence of the Impact	
1	
2	
3	
4	High frequency – e.g., daily
5	

4.8.2 **Severity of impact** – defined as the actual or potential severity of the accident rate or environmental impact (e.g., toxicity, disposal, duration of impact, ability to migrate and cleanup, etc.) in terms of its impact to consumer safety (physical or chemical hazards) or the environment (air, water, land, soil, and groundwater) from the final product itself. Evaluate whether the end user will have concerns with use, disposal, storage, etc. of the product. Similarly under abnormal conditions, could employee safety and the environment be potentially impacted in the event of [REDACTED]

Severity of Impact	
1	No adverse safety or environmental impact
2	
3	
4	Significant safety or environmental impact, difficult to control
5	

Scale of use or impact – defined as the actual or potential scale (e.g., size, volume, magnitude) of the PAS relating to production. Designate a PAS in the facility that is highest producer of final products as a "5" and extrapolate accordingly for the remaining PAS.

Scale of Use or Impact	
1	
2	

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3	
4	
5	High scale production

4.8.3 **Legal or regulatory concern** – defined as regulatory exposure of the PAS as it relates to the production of final products applicable to federal, state, and local laws as well as Corporate or “other” standards. For example, regulations such as TSCA or DOT would potentially affect the final product the greatest.

Legal or Regulatory Concern	
1	
2	
3	
4	
5	Violates regulatory requirements or permit conditions

4.8.4 **Degree of control or influence** – defined as the level of control that the site has over the final product's safety and recycle ability for the end user. For products, evaluate

Degree of Control or Influence	
1	
2	
3	
4	
5	Completely within the site's control

4.8.5 **Stakeholder concern** – defined as the actual or potential severity of the final product, in terms of its potential to impact worker safety or damage to the environment (e.g., toxicity, duration of impact, ability to migrate or cleanup, etc.) by the end user, as perceived by internal or external groups including Customers.

Stakeholder Concern	
1	
2	
3	
4	
5	

The Hazard Analysis Review Team ranks the significance of each product impact in each PAS according to the above criteria and scoring system using the Worksheet provided with this procedure. The total significance ranking for each PAS is derived from

4.9 Significance Ranking Cut-off

4.9.1 The Hazard Analysis Review Team, in consultation with the site management, will establish a separate significance ranking cut-off level for each individual EHS element. PAS with total significance rankings at or above the cut-off level for each individual element will be considered a “Significant Operation”.

4.9.2

4.9.3 A significant operation will have three parts to its name as follows:

Functional Area/Specific PAS/Impact

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[Redacted]

[Redacted]

4.9.4 If this was the only impact for this specific PAS that scored above the significance cut-off level after evaluating all of the EHS elements, then the facility would [Redacted]

[Redacted]

4.9.5 The list of Hazard Analysis is used to assist in the selection of objectives and targets.

4.9.6 The cut-off level for each EHS element is re-evaluated by the EHS on an annual basis, at a minimum. As the site works to improve its performance relating to EHS (i.e., reduce the element impacts of its Hazard Analysis), it is anticipated that [Redacted]

[Redacted]

4.9.7 The EHS is responsible for keeping the list of PAS up-to-date on an annual basis, at a minimum. Additionally, the EHS [Redacted]

[Redacted]

4.9.8 It is anticipated that in time, as the site makes improvements through achieving its objectives and targets, many of the initially designated Hazard Analysis will be re-assessed at a lower ranking. Similarly, other PAS that were ranked as less significant will move up in priority as the significance cut-off levels are lowered. It is through this process that the site will [Redacted]

[Redacted]

5.0 Records

The following records will be generated as a result of this procedure:

- [Redacted]
- [Redacted]

All records associated with this procedure are maintained.

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Figure 3: Hazard Analysis

Date:												
Functional Area:												
Normal Products, Activities and Services												
EMPLOYEE SAFETY	■	■	■	■	■	■	■	■	■	■	■	
Physical Hazards:												
Health Hazards:												
ENVIRONMENTAL												
████████████████████												
████████████████████												
PROPERTY												
████████████████████												
████████████████████												
RESOURCE												
████████████████████												
PRODUCT												
████████████████████												
████████████████████												
Non-normal Products, Activities and Services												
EMPLOYEE SAFETY	■	■	■	■	■	■	■	■	■	■	■	■
Physical Hazards:												
Health Hazards:												
ENVIRONMENTAL												
████████████████████												
████████████████████												
PROPERTY												
████████████████████												
████████████████████												
RESOURCES												
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PRODUCT												
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LIST OF HAZARDS

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

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Implementation Tips

- *The identification of Hazards is a critical element of the EHS System. The PAS' impacts identified as "significant" are subject to further requirements within the EHS System, including consideration during the establishment of objectives and targets, the development of documented operational control procedures, monitoring and measurement and employee awareness and training.*
- *The initial significance cut-off for each EHS element should be established at a reasonable level that will result in a manageable number of Hazard Analyses. It is better to have a manageable number of Hazard Analyses fully under control than to have a greater number of PAS impacts that have not been fully tied-in to the requirements of the EHS System.*
- *The site's Hazard Analysis must be considered when setting objectives and targets.*
- *Try to achieve a consensus decision when establishing significance rankings. Other site staff may need to be consulted to fully understand the potential for impacts in some areas. It is helpful to use the same Hazard Analysis review team for the significance ranking process to help ensure consistency in assigning ranking scores for the various criteria.*
- *To ease in implementation of the initial EHS System, indirect PAS (i.e., those under influence and not full control of the site such as suppliers or contractors) may be addressed through the operational control procedures for suppliers. PAS related to suppliers and other operations over which the site does not have full control are not typically designated as "significant" during the early stages of the EHS System.*
- *Take special care to ensure that the delineation of Hazard Analysis can be defended. Although the establishment of the cut-off level may seem somewhat arbitrary, make sure that the mechanism for making that determination is clear, well documented and produces results that are sensible. As an example, if a company did not identify that a bulk raw storage material tank without secondary containment and located near a storm water drain is a PAS, let alone a significant one, this might not be acceptable.*
- *Once all of the worksheets have been scored, it will not be unusual to see functional areas with different PAS with a variety of impacts that scored above the significance cut off. The team should observe that the products, activities and services having the most impact on employee health and safety, environment, property, resources and products should obviously score the highest - if that is not the case the team should determine the cause.*

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