



**FACULTAD DE INGENIERÍA EN CIENCIAS APLICADAS
CARRERA DE INGENIERÍA INDUSTRIAL**

TECHNICAL REPORT

DEGREE WORK:

**"PROPUESTA DE UN MANUAL DE PROCEDIMIENTOS SEGUROS
EN BASE AL DIAGNÓSTICO Y EVALUACIÓN DE LOS FACTORES
DE RIESGO FÍSICOS DE LA BODEGA DE PRODUCTO
TERMINADO DE LA FÁBRICA INDUTEXMA"**

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Abstract

“Everyone will have the right to perform their tasks within an adequate and proper environment, that guarantees their health, integrity, safety, hygiene and wellbeing” as it is declared in the “Constitución de la República del Ecuador, 2008”. Realizing this article, every organization in the country has the obligation to look after the physical and mental health of its employees”.

This actual project's objective is to give an orientation regarding the finished products management and in turn promote employees' health by the use of risk and prevention management.

A risk management technique identified, measured and evaluated each risk that an employee is exposed to. Once those risks were identified they are measured, compromising lighting, temperature, environmental quality and types of noise. The results from this study are considered to determine what sub-standard conditions are present at the worksite and the aspects surrounding workplace organization.

Eventually we proceeded to the Evaluation step. Results regarding the measures were compared according to the ideal standard parameters ruled by the Health and Safety Occupational Board named in chapter 1.

Introduction

The lack of management and practicing of policies, rights and decrees as to how to provide employees wellbeing when performing a certain position techniques, methods and procedures are applied threatening employees working at finished product warehouse at the Indutexma factory.

Activities and procedures have not been identified therefore, personnel does not possess knowledge regarding short and long term health issues that can be brought upon. Everyday activities are not performed under any safety or hygiene parameter.

An improving method to be implemented is the Procedures Manual that will help manage statistics and probabilities of accident occurrences and overall it will advise employees how to react when work-related issues arise.

It has been fulfilling and necessary to realize an study of the risk factors for the personnel that works in this area since the probabilities that accidents happen and sicknesses may take place have been determined. To this, improvements that will minimize the identified risks have been implemented.

This project's objectives are as follows:

- To know the rising and development of industrial safety, its methodology and norms regarding accident and sickness prevention, eventually applying them at the finished product storage area.

- To diagnose and analyze different working procedures at the finished product storage area and its facilities in order to create a risk source.
- To identify risk factors within the storage area through a triple criteria source to determine what risks are favorable or intolerable to the personnel.
- To make a proposal regarding correcting measures in order to improve work environment, consequently optimizing individual performance.
- To put forward a Procedures Manual so that the risks which personnel at the storage area are exposed to, are able to be censored

CHAPTER 1

Chapter one covers the theoretical basic context fundamental to job performance. It encompasses a description in regards of occupational health and safety procedures, its evolution and benefits within the industry, considering accident and sickness prevention as the most important objective of any organization highlighting the importance of doing follow ups and having permanent control to acquire better productivity and optimum working environment.

Moreover, we take a look at the actual legal framework according to the Republic Constitution, IESS's General Labor Risks Insurance and External Institutions that supervise internal management procedures.

Industrial Safety

Industrial Safety is the set of techniques and activities destined to identify and evaluate accident cause control. It attends to keep a safe work environment through analyzing basic and potential causes that may threaten the physical integrity of employees and the company's resources.

It plays an important role as for employees' wellbeing and as for the improvement of the company work environment.

Industrial Hygiene

Rules and procedures that allow accident and sickness prevention must be implemented. Hygienic activities include the following:

- Tidiness and cleanliness of work areas
- Basic integral sanitation (rest rooms, toilettes, dining rooms, waste containers, animal presence).

Prevention measures and exposure control to biological contaminants (viruses, bacteria), chemical and physical products, (noise, lighting, temperature, radiation).

DEFINITION AND TERMS

Health: It is a complete state of physical, mental and social wellbeing, having the absence of affections or illnesses. (Constitucion de la Organizacion Mundial de la Salud, 1946. Pg. 1)

Employment: a set of human activities paid or not, that produce goods or services within and economy; or they satisfy a community's need or provide sustainability means needed for individual. (Organizacion Internacional del Trabajo OIT, 2004).

Health and Occupational Safety (S Y SO): Conditions and factors that may affect employee health and safety, temporary workers, contractors, visitors and any other person at the work place. (OSHAS 1800,2007)

Risk factors: Specific risk factors are those that carry risks of illnesses, professional or occupational and cause mechanical, chemical, physical, biological, agronomical and psychosocial effects. (Resolucion 390, 2011).

Incident: Event (s) related to work having the potential leading to injuries or illnesses (regardless of severity or fatality) (OSHAS 18001, 2007)

Workplace accidents: it is defined as an unforeseen sudden event that causes an employee a body injury or functional disturbance, by chance or by others. (Codigo del Trabajo, 2005).

Professional Illnesses: These kinds of illnesses are acute or chronic conditions produced directly by the exercise of the profession or labor that an employee does, it may cause disability.

Procedure: A specific way to carry on an activity or process (ISO 9001, 2008)

LEGAL FRAMEWORK

- CONSTITUCIÓN POLÍTICA DEL ECUADOR: 2008
- DECISIÓN 584 INSTRUMENTO ANDINO DE SEGURIDAD Y SALUD EN EL TRABAJO
- CÓDIGO DEL TRABAJO
- INSTITUTO ECUATORIANO DE SEGURIDAD SOCIAL
 - Reglamento de Seguridad y Salud de los Trabajadores y Mejoramiento del Medio Ambiente de Trabajo. Decreto Ejecutivo 2393/1986
 - Reglamento Orgánico Funcional del IESS, (Resolución C.D. 021) de la Dirección del Seguro General de Riesgos del Trabajo
- REGLAMENTO DEL INSTRUMENTO ANDINO DE SEGURIDAD Y SALUD EN EL TRABAJO RESOLUCIÓN 957
- DIRECCIÓN DEL SEGURO GENERAL DE RIESGOS DEL TRABAJO.
 - Reglamento de Seguridad y Salud de los Trabajadores y Mejoramiento del Medio Ambiente de Trabajo. Decreto Ejecutivo 2393/1986
 - Reglamento Orgánico Funcional del IESS, (Resolución C.D. 021) de la Dirección del Seguro General de Riesgos del Trabajo

- REGLAMENTO DEL INSTRUMENTO ANDINO DE SEGURIDAD Y SALUD EN EL TRABAJO RESOLUCIÓN 957
- DIRECCIÓN DEL SEGURO GENERAL DE RIESGOS DEL TRABAJO.
 - Resolución C.D. Nº. 390 “Reglamento del Seguro General de Riesgos del Trabajo”.
 - Resolución C.D. Nº. 333 “Reglamento para el Sistema de Auditoría de Riesgos del Trabajo – SART.”

CHAPTER II

In chapter II a general description indicating its geographical location of the FabriNorte Ltda. Enterprise “Indutexma”, value chain, including different macro-processes and product storage area description is given. Supporting personnel and their described functions in the process diagrams facilitate functions understanding and evaluation of performed activities at the company and at the area to be evaluated.

FABRINORTE is the commercial name of the company known as Indutexma, which is comprised of four stake holders: Don Ricardo Moreno, Don Patricio Javier Moreno, Don Wilson Roman Moreno and Mrs. Mariela Moreno.

It was created in 1970, under Don Wilson Roman Moreno’s initiative; originally destined to sell acrylic thread. However, by the beginning of 2010, the business has a production plant and four warehouses.

Economic Activity: the company buys and sells acrylic thread and it produces and commercialized knitwear. Among these types of knitwear produced are: jersey, pique necks, fleece, interlock, lysates, rib and lycra, woven Hindu and towels are produced as well.

PROCESSES DESCRIPTION:

FACTORY GENERAL FLOWCHART: It shows the actual situation of people interrelations with their sources in a very clear way and its application to Systems Management and Procedures.

It allows finding out each process activities so that procedural interrelations among different departments, sections and people are developed in a sequential and chronological way.

- **FINISHED PRODUCT WAREHOUSE DESCRIPTION**

The warehouse is located at the plant’s entrance in order to facilitate the exit of fabric rolls to the different trucks from the factory.

STORAGE: The applied method at the warehouse finished product as far as inventory is called FIFO, where all the production that first comes into the warehouse is the first one that goes out for sales and distribution.

- Check in and out of the finished product flowchart
- Activities description of the storage process of the finished product warehouse
- Check in and out dispatch process flowchart of the finished product
- Activities description of the dispatch check in and out process of the finished product

CHAPTER III

Chapter III.- Risk Management Techniques. The process to be followed starts by identifying the physical risks factors, taking into account workplace, activities and tasks that the employee has to perform as well as long and short term risks and accident record and professional illnesses.

According to Article 3 of the Principios de la Accion Preventiva, (literal c) General Workplace Risks Insurance Regulations C.D. 390 indicates that the principle for preventative risk action contemplates the identification of Measurements, Evaluation and Risks Control of the work environments (Resolucion 390, 2011, pg. 3)

- **RISK IDENTIFICATION**

Risk factors identification at the finished product warehouse pertaining to this organization will be realized according to certain characteristics at this workplace.

The chosen method to identify actual risks factors in the warehouse must comply with a quick, simple and efficient procedure used in the Check List of the factory's Environmental Verification Condition.

TABLE 01 PHYSICAL RISK FACTORS			
PHYSICAL RISK FACTORS	COMPLIES	DOES NOT COMPLY	DOES NOT APPLY
LIGHTING	1	3	
NOISE	2	2	
TEMPERATURE AND HUMEDITY		7	
VIBRATIONS			2
RADIATIONS			3

- **INITIAL RISK EVALUATION**

It is done to find out the risk level which an employee is exposed to and to find out if measurements of qualified equipment should be done so that preventive measures that eliminate or control such risk are established.

INSHT Evaluation Method

RISK LEVELS

		Impact		
		SLIGHTLY HARMFUL LD	HARMFUL D	EXTREMELY HARMFUL ED
Probability	Drop B	Trivial Risk T	Tolerable Risk TO	Moderate Risk MO
	Medium M	Tolerable Risk TO	Moderate Risk MO	Significant Risk I
	High A	Moderate Risk MO	Significant Risk I	Intolerable Risk IN

The situation of nine employees was analyzed only to conclude that trivial tolerable, moderate, important risks exist, and have to be eliminated or reduced through preventive measures and periodical control of such conditions, working methods and employees health.

The preceeding evaluations will be managed by the main office of general physical risk factors at the factory and must be followed up and controled by the Unit of Industrial Safety. Direct emphasis must be given to risks as intolerable (red) while controlling and mitigating the remaining identified risks.

Following is the general physcial risks main office, illustrating each job position to determine an action plan and corrective measures to be applied in the Safety Procedures Manual.

PHYSICAL RISK MAIN OFFICE

GENERAL INFORMATION			PHYSICAL FACTORS										QUALIFICATION					
			EMPLOYEES total	Women No.	Men No.	Fires	Explosions	Temperature Stress	Térmic Contact	Exposure to external environmental temperatures (heat and cold)	Exposure to ionized radiation	Exposure to non ionized radiation	Noise	Vibrations	Lightning	ESTIMATED RISK		
TRIVIAL RISK (T)	TOLERABLE RISK (TO)	MODERATE RISK (MO)														IMPORTANT RISK (I)	INTOLERABLE RISK (IN)	
TOTAL DE TRABAJADORES			9	0	9									T	TO	MO	I	IN
FINISHED PRODUCT WAREHOUSE	Warehouse Manager	Check that the rolls getting out of the warehouse weigh according to the order. Coordinate fabric exit and personnel dates.	1		1	1			1			1	1		2	2		
	Warehouse Employees	Transport product (fabric) From quality control to the warehouse. Place fabrics according to classification	4		4	1		1	1			1	1		1	2	2	
	Dispatcher and Driver	Help dispatch and unload products to warehouse. Transport orders to diferent destinations.	4		4		1	1	1			1	1	3	1	1		

- **RISK FACTORS MEASURES**

It is done periodically with the purpose of finding out the different work areas and plant's current status

It is important to perform this procedure to set action plans and controls for each work post, especially in the warehouse area where high temperature and ventilation risks were detected.

According to la Legislacion Ecuatoriana en la Resolucion 333, occupational risk factors measurements must be performed at each work post once identified.

Requirements to be met in order to perform risk measurements are:

- Qualified technicians
- Renowned methods
- Calibrated equipment

- **RISK EVALUATION**

This process is intended to identify and locate possible employees' safety and health risks, as well as to evaluate and prioritize its correction.

The company directors are responsible for the evaluation though personnel and their representatives should be asked about the method used to perform certain tasks, considering that it must be adjusted to existing risks and to the level required.

- **RISK CONTROL**

It is "the decision making process that deals with reducing risks from the obtained data at the risk evaluation to implement corrective actions and their enforcement as well as performing periodical risk estimating".

- **PREVENTIVE PLANNING MANAGEMENT**

It is performed for physical risk factor prevention and control. After the results of the risks estimates are found, base priorities are designed, according to risk gravity and the number of employees who are exposed to such risks.

The Management Preventive Plan established the following adjustments and input:

- Adjustment Plan and Infrastructure
- Training and Instruction Plan
- Equipment acquisition and personal protection Plan
- Signaling Plan

CHAPTER IV

This chapter discloses the Proposal for the Safety Procedures Manual that contains procedures and tasks, prevention measures as applied to the finished product warehouse finalizing with employees' and employer's responsibilities.

CHAPTER V

In the fifth and last chapter conclusions of this research study are presented. They respond to the general objective and thesis specifics, disclosing recommendations to have an efficient accidents and professional sickness prevention management which the employees of the finished product warehouse are exposed to.