Artículo Científico.

Diagnosis, Evaluation , Prevention and Control of Occupational Risk Factors of Teachers , Administrative and General Services Engineering Faculty of Applied Science , Technical University of the North.

Author: Jhoan Cevallos Miguel Delgado.
Coauthor: Mr. Marcelo Puente

Engineering Faculty of Applied Science

Industrial Engineering Career

Northern Technical College

Ciudadela Universitaria , Av July 17 , Barrio El Olivo , Ibarra , Ecuador

jhoanw78k@hotmail.com , pmpuente1959@hotmail.com

Summary

"Everyone has the right to develop their work in a supportive environment and supportive to ensure their health, integrity, security, health and welfare" in the Constitution of the Republic of Ecuador, considering this legislation all organizations in the country are obliged to care for physical and mental health of their workers.

The study was based on the need to improve the working conditions of the staff of the Engineering Faculty of Applied Science, Technical Management performing Safety and Health at Work (identification, measurement, assessment and control of occupational hazards) that will help prevent incidents, accidents and diseases.

Identification was performed by applying risk encuetas, interviews and observation of work environments, identified risk measurement and comparison with national legislation, then proceeded to evaluate the 1068 risks identified by applying the criteria Triple Method (Probability, severity and vulnerability), finally obtained the degree of danger of the risks identified in the management being prioritized by severity preventive and published in the risk identification matrix.

It helped 100 workers of the Engineering Faculty of Applied Science, in order to improve the performance of human talent and prevent injuries and illness in the health of staff.

Keywords: Safety, Health, Risk Management, Technical, Jobs.

1. Introduction

The risks of labor are harmful eventualities to which the worker is exposed as a result of their work, which can become fatal if not identified and controlled in time; it is the obligation of employers to provide safe working environments.

The research will be conducted in Northern Technical University located in the city of Ibarra in the Barrio el Olivo and to this particular study will be referred to the Engineering Faculty of Applied Science - FICA, since we do not have a Technical System Safety and Health at Work does not guarantee its workers and students hazard controlled environments.

And knowing the problems that can cause occupational hazards, whether, in the worker's health, productivity of their processes, economy and causing legal problems for the employee and employer, this study was conducted in different areas and sectors of the campus.

The aim of the study is to diagnose, evaluate, prevent and control occupational risk factors of staff performing their daily activities in this center of higher education and ensure safe work environments and comply with Health and Safety Legislation in Work.

2. Materials and Methods

Below is the materials, tools and methods used in conducting the Technical System Safety and Health at Work of the Engineering Faculty of Applied Science:

Survey process.

We performed the lifting of personnel processes under study (100), taking into account the micro, meso and macro processes, which helped highlight the activities of the workers.

Polls

Was used a questionnaire to all the risks associated with the proposed risk identification matrix.

Interviews

Staff with specific lectures, related to incidents, accidents and diseases arising in the work environment.

Tools that helped 1068 identifying occupational hazards present at the Engineering Faculty of Applied Science.

Measuring work environment.

By identifying insufficient lighting in the work environment which is a physical hazard, we proceeded to the measurement.

Illuminance.

The equipment used to measure this risk was the delta portable light meter ohm, specialized equipment for measuring this risk.

They look the measurement points, calculated by the method of zonal cavities in these measurements were taken points q then should be compared to the Ecuadorian legislation.

In case of non-compliance should calculate the number of luminaires needed:

Average illuminance

$$\mathbf{E\ prom} = \frac{\sum_{i}^{n} \mathbf{Ei}}{\mathbf{n}}$$

Uniformity

$$\boldsymbol{Uniformidad} = \frac{\boldsymbol{Emin}}{\boldsymbol{E\ prom}}$$

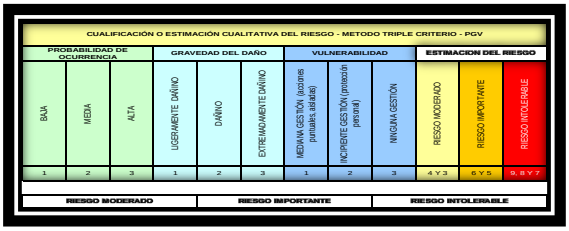
Risk Assessment.

Each identified risk must be evaluated by applying the three-part test method

Triple Method Criterion.

Method to quantify the risk with an analysis of Probability, Severity and Vulnerability:

- Likelihood is time to which the worker is exposed to the risk factor.
- Severity of damage, an assessment is made at the discretion of the analyst which can be harmful risk.
- Vulnerability management is taking place before the risk factor so that we become vulnerable to this.



The estimation method is performed by summing the score of 1 to 3 of each parameter.

If the result of the sum of the evaluation is within the following ranges of risk is classified as follows:

- If the risk is between 4 and 3, will be considered moderate risk, and take the yellow color.
- If the risk is between 6 and 5, will be considered significant risk and take the orange.
- If the risk is between 9.8 and 7, will be considered intolerable risk and take the red.

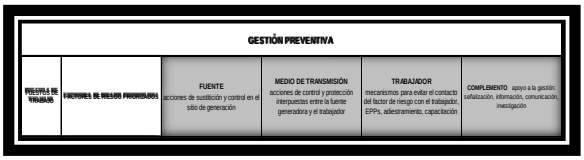
The results obtained must be transcribed to the risk identification matrix with its own color.

Prevention and control.

The following risks were prioritized taking into account the severity of each of these evaluation results.

Prioritization of risks.

First will be considered as intolerable risks that could cause extremely harmful to worker injuries or death, then take into account major risks that can likewise cause harm to the health of workers and finally we consider moderate risks.
Then you need to consider the following control for each of the prioritized risks.
It should analyze the possibility of controlling the risk at source, transmission medium, and the addition worked as the established order.
Each risk should have at least one of these controls.



Auditing

Every organization should be audited to demonstrate its Safety and Health at Work.

You can make a mini audit taking into account the parameters established by the Health and Safety legislation at Work and the Social Security Institute, in order to highlight the level of compliance of the organization.

It should be noted that this audit is done by the Ecuadorian Social Security Institute who is the only organization in the country with the power to do it.

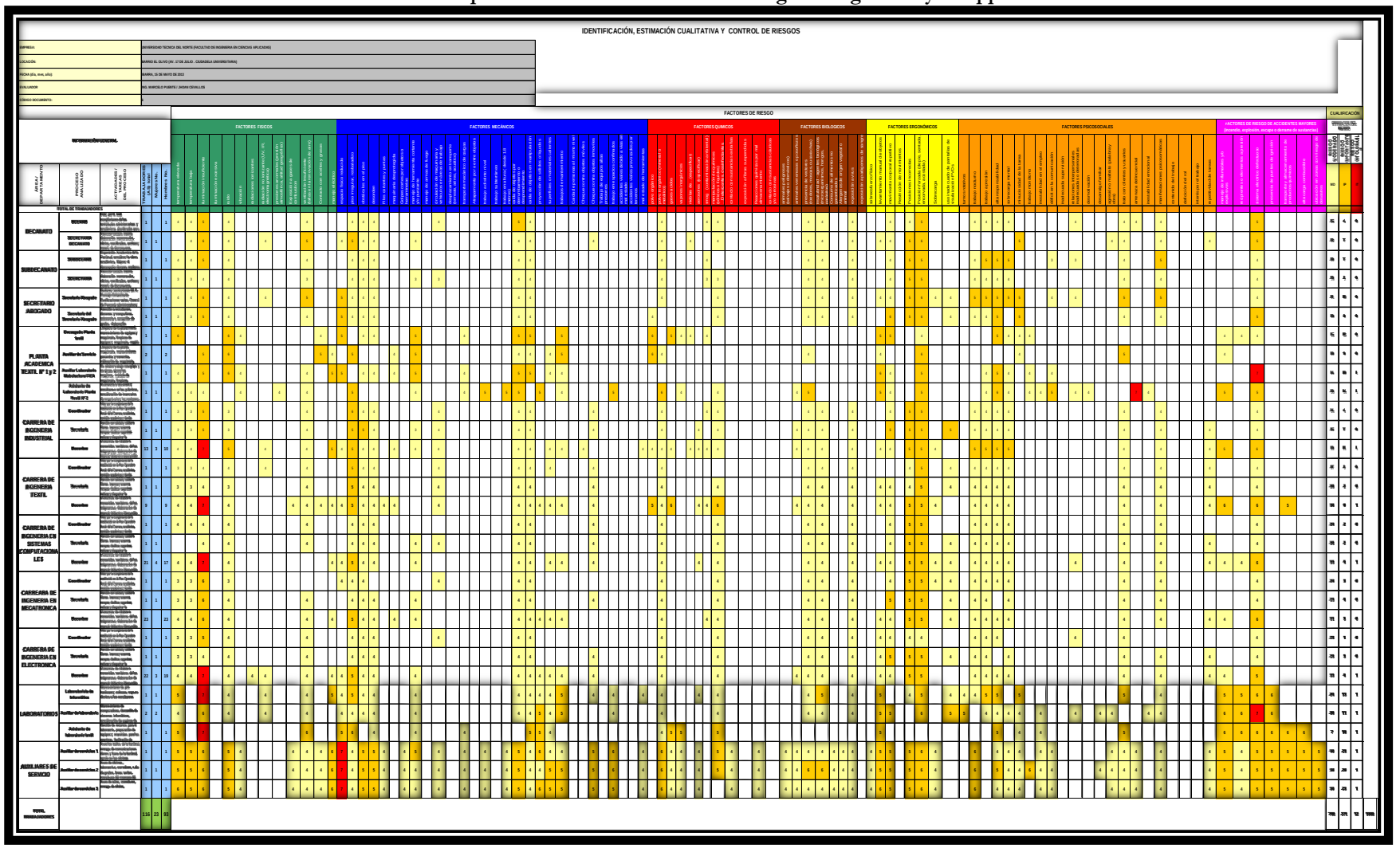
3. Results

Table of results of identification and risk assessment.

RESULTADOS DE LA IDENTIFICACION Y EVALUACION DE RIESGOS EN LA FACULTAD DE INGENIERIA EN CIENCIAS APLICADAS

DEPARTAMENTO	PROCESO	FISICOS			MECANICOS			QUIMICOS			BIOLOGICOS			ERGONOMICOS			PSICOSOCIALES			ACCIDENTES MAYORES			TOTAL	
		MOD	IMP	INT	MOD	IMP	INT	MOD	IMP	INT	MOD	IMP	INT	MOD	IMP	INT	MOD	IMP	INT	MOD	IMP	INT		
DECANATO	DECANO	4	1		5	1		3			3			2	1		8				1		29	58
	SECRETARIA DECANATO	3	2		7	1		3			3			2	2		4	1			1		29	
SUBDECANATO	SUBDECANO	4	1		5			2			3			1	2		4	4		1			27	55
	SECRETARIA	5			7			3			3			1	2		6			1			28	
SECRETARIO ABOGADO	SECRETARIO ABOGADO	4	2		5	1		2			3			4	2		2	7		1			33	60
	SECRETARIA DEL SECRETARIO ABOGADO	4	1		5	1		2			3			1	3		4	2			1		27	
PLANTA ACADEMICA TEXTIL Nº 1 y 2	ENCARGADO PLANTA TEXTIL	2	2		3	5		3	2					1	2		3	1		3			27	106
	AUXILIAR DE SERVICIO	1	3		4	3		1	1		1			1	1		1	1		1			19	
	AUXILIAR LABORATORIO MABUFACTURA FICA	3	3		6	4								1	2		4	1				1	25	
	ASISTENTE DE LABORATORIO PLANTA TEXTIL Nº 2	6			3	6		2	1		1	1		1	2		7	2	1		2		35	
CARRERA DE INGENIERIA INDUSTRIAL	COORDINADOR	4	1		6	1		3			3			1	2		6			1			28	105
	SECRETARIA	4	1		6	2		3			4				4		7			1			32	
	DOCENTES	4	2	1	12	1		7			4			3	2		3	4			2		45	
CARRERA DE INGENIERIA TEXTIL	COORDINADOR	6			7	1		1			3			2	1		7			1			29	105
	SECRETARIA	5			6	1		2			3			4	1		7			1			30	
	DOCENTES	7		1	12	1		3	3		4			3	2		7				3		46	
CARRERA DE INGENIERIA EN SISTEMAS	COORDINADOR	5			6			2			3			1	2		6			1			26	92
	SECRETARIA	3			8			2			3			2	2		7			1			28	
	DOCENTES	4		1	9	1		3			3			4	2		8			2	1		38	
CARREARA DE INGENIERIA EN MECATRONICA	COORDINADOR	3	1		6			2			3			3	2		6			1			27	90
	SECRETARIA	4	1		7			2			3			1	3		5			1			27	
	DOCENTES	5	1		9	1		3			3			3	2		7			1	1		36	
CARRERA DE INGENIERIA EN ELECTRONICA	COORDINADOR	4	1		6			2			3			4			5			1			26	92
	SECRETARIA	5			6			2			3			2	3		6			1			28	
	DOCENTES	7		1	10	1		2			4			2	2		7			1	1		38	
LABORATORIOS	LABORATORISTA DE INFORMATICA	3	2	1	11	2		3			2	1		2	2		3	4			4		40	106
	AUXILIAR DE LABORATORIO	4	1		9	2		2			3				4		10	1			3	1	40	
	ASISTENTE DE LABORATORIO TEXTIL		2	1	4	4		1	3						1		2	2			6		26	
AUXILIARES DE SERVICIO	AUXILIAR DE SERVICIOS 1	4	5		11	7	1	5	2		7			3	4		10	1		1	6		67	199
	AUXILIAR DE SERVICIOS 2	4	5		11	7	1	5	2		5	2		2	4		10	3		1	6		68	
	AUXILIAR DE SERVICIOS 3	4	5		10	8	1	5	1		7			2	4		10	1		1	6		65	
TOTAL		125	43	6	221	62	3	81	15		93	4		59	68		182	35	1	24	44	2	1068	1068
		174			286			96			97			127			218			70			1068	

Result Matrix Occupational Hazard Identification Engineering Faculty of Applied Science.



4. Conclusions

After the study, it was established preventive measures for staff and students who work at these facilities to do their jobs more safely, based on the objectives in this research it was concluded that:

The diagnosis made at the Engineering Faculty of Applied Science in Occupational Safety and Health 1068 hauling the result of occupational hazards identified, which are divided among the different risk factors, taking into account the group of people and students that make up the faculty, the diagnosis was very encouraged by what is taking steps to remove them and control them.

We performed the 1068 assessment identified risks using the method recommended by the risk identification matrix (three part test method) and obtained a score of 785 moderate risks , significant risks and 12 271 intolerable risks which were prioritized preventive management .

Was established risk control by implementing preventive management recommended by the risk identification matrix, which are prioritized all risks considered in the evaluation, intolerable and significant risks, which received adequate treatment.

Most people agree affected by ergonomic hazards in their job for the various positions to be taken by their daily work.

There are no emergency exits as the building only has one entrance and exit.

Students and teachers, when performing hazardous activities, do not make use of personal protective equipment because they do not have these.

If you follow through and compliance with the provisions of the study may spend an external audit is prepared by the Social Security Institute Security through General Occupational Hazards entity that has the authority to audit the security companies and occupational health and is a legal requirement for the operation of the university.

10. Acknowledgements

I thank Mr. Marcelo Puente study director, who was the person who guided me and I offer all their knowledge to successfully complete degree work.

At the Faculty of Engineering in Applied Science provide me all facilities to conduct the study.

11. References

- Instituto Nacional de Seguridad e Higiene en el Trabajo. "Gestión de la prevención de riesgos laborales en las pequeñas y medianas empresas". 2002: .
- Bascuas J. Hernández, j. (2012). Prevención de Riesgos Laborales. Madrid, España: Fundación MAPFRE.
- Chiavetano, I, . (México). "Administración de Recursos Humanos". 1994: Editorial Mc Graw Hill.
- Constitución de la Republica del Estado. (2005). Derecho del Trabajador (Vol. 1). Quito, Pichincha, Ecuador.
- CORTES DIAZ Jose María. (2007). Seguridad e Higiene en el Trabajo, Técnicas de Prevención de Riesgos Laborales. Madrid: Tébar, S.L.
- Cortes José Días María . (2007). Seguridad e Higiene del Trabajo, Técnicas de Prevención de Riesgos. Madrid: Editorial Tébar, S.L.
- Enrique, FRANKLIN B. (2004). Organización de Empresas. Mc Graw Hill.
- HENAO ROBLEDO Fernando. (2008). Riegos Físicos III, Temperaturas Extremas y Ventilación. Bogotá: Ecoe ediciones.
- HENAO ROBLEDO Fernando. (2008). Riesgos Físicos II, Iluminación. Bogotá: Ecoe ediciones.
- HENAO ROBLEDO Fernando. (2009). Riesgos Químicos. Bogotá: Ecoe Ediciones.
- IESS. Reglamento de seguridad y salud para la construcción y obras publicas.
- IESS. (2005). Sistema de Administración de la Seguridad y Salud en el Trabajo. Quito, Pichincha, Ecuador.
- INSTITUTO NACIONAL DE SEGURIDAD DE HIEGIENE EN EL TRABAJO DE ESPAÑA. (2008). MANUAÑ DE GESTION EN PREVENCION DE RIESGOS LABORALES. MADRID.
- Instrumento Andino de Seguridad y Salud en el Trabajo. (2004). Decisión del Acuerdo de Cartagena 584. Cartagena: Registro Oficial Suplemento 461.

- Puente Marcelo Carrera. (2001). Higiene y Seguridad en el Trabajador. IBARRA.
- Sistema de Administración de la Seguridad y Salud en el Trabajo.
- Sistema de Administración de la Seguridad y Salud en el Trabajo. Sistema de Administración de la Seguridad y Salud en el Trabajo.
- SUSANA DE LA CASA QUESADA,. (2009). PLAN DE PREVENCION DE RIESGOS LABORALES EN LA EMPRESA: ORGANIZACI ON, EVALUACION Y PLANIFICACION. Madrid: COMARES.
- SWIATLOMIERZ. (1968).
- TAYLOR Geoff. (2006). Mejora de la Salud y Seguridad en el Trabajo. Madrid: EL SEVIER.

…….

AUTHOR: JHOAN CEVALLOS

……

CO-AUTHOR: ING. MARCELO PUENTE