

Metodología de verificación de la seguridad y la higiene desarrollada en el TECNМ

Safety and hygiene verification methodology developed at the TECNМ

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RESUMEN

La presente propuesta El objetivo metodológico es incrementar la revisión periódica de los trabajadores mineros en materia de seguridad e higiene para disminuir accidentes, robo de herramientas, materiales de trabajo y evitar el ingreso de trabajadores en un estado de salud indeseable para la empresa. Desarrollado en el Instituto Tecnológico Superior de Fresnillo en la carrera de minería y el cuerpo académico de desarrollo industrial y empresarial. El objetivo primordial es llevar a cabo un programa de verificación del uso del equipo de seguridad personal adecuado, revisión periódica de inventarios. Una vez realizado lo anterior, se espera incrementar el control de entrada y salida de los trabajadores, aumentando su eficiencia en el trabajo y evitando así la transmisión de enfermedades (covid-19).

Palabras claves: Seguridad, higiene, accidentes, verificación

ABSTRACT

The present proposal The methodological objective is to increase the periodic review of mine workers in the field of safety and hygiene to reduce accidents, theft of tools, work materials and prevent the entry of workers in a state of health that is undesirable for the company. Developed at the Instituto Tecnológico Superior de Fresnillo in the mining career and the industrial and business development academic body. The primary objective is to carry out a verification program for the use of adequate personal safety equipment, periodic inventory review. Once the aforementioned has been carried out, it is expected that entry and exit control over workers will increase, increasing their efficiency at work and thus avoiding the transmission of diseases (covid-19).

Keywords: Safety, Hygiene, Accidents, Verification

INTRODUCTION

The Instituto Tecnológico Superior De Fresnillo from the academic body Industrial and business development, in the mining engineering career, as well as with the participation of the ITSF young researchers club. developed this proposal for Safety and Hygiene in the Mining Industry for the implementation of constant review of mining work personnel, considering that workers have the need and the right to be informed, as well as the application of safety measures and the Hazards Present in the Mining Industry. This document will be addressed to the work personnel who work in the mining company and who are related to mining tasks. It is also designed for the periodic review of mining personnel to completely reduce ant theft, which is one of the main causes of mining. The use of health measures and the control of people who become alcoholic or with other substances that are not favorable to the worker's health. It is also desired to give a presentation on how to act in the event that a worker presents symptoms of the covid-19 disease or appears in a state in which they have consumed improper substances in their body.

The objective is that they are informed and know:

- The general risks that may arise in the work areas
- Preventive measures for the verification of the worker and that the work to be carried out is safe
- Reduce the theft of tools or minerals belonging to the company
- Safety and hygiene protocols applicable to the mining industry
- Security filters for staff review if you have respiratory symptoms

To have a safe work environment it is of the utmost importance that:

- Comply with established protocols and maintain a preventive attitude.
- Create a work climate that is favorable to the worker and have a culture of safety so that workers do a good job.

Method Description

- This Safety and Hygiene manual aims to inform about the different risks of occupational accidents and illnesses that can occur in the work environment, and suggests a set of preventive measures to avoid or minimize said risks (uria).
- Mining industrial hygiene and safety is understood as the set of technical measures aimed at preserving both the life and physical integrity of workers and maintaining materials, machinery and facilities in the best possible service and productivity conditions. (Rodriguez, 2010)

RULES

- The rules by which a glass store must govern for the protection and hygiene of its employees are the following.
- Official Mexican STANDARD NOM-023-STPS-2011, Construction-Safety and health conditions at work. (Mexico, 2020)

Aim

- Establish the safety and health conditions at work in mining works, in order to prevent occupational risks to which workers who work in them are exposed.

Scope

- This Official Mexican Standard applies to all mining works carried out in the national territory, in any of its different activities or phases before the corresponding authority.

Definitions

- For the purposes of this Standard, the following definitions are established:

Analysis of potential risks

- The document that contains the characteristics of the mining work and the risks associated with each of the activities and phases that are carried out in it, as well as the preventive measures for each identified risk. (employment, 2019)

Labor Authority

- The competent administrative units of the Ministry of Labor and Social Welfare that carry out inspection functions in matters of safety and health at work, and those corresponding to the federal entities and the Federal District, which act in aid of those.

Workplace

- The areas where construction works are carried out.

Contractor; builder; construction company

- The physical or moral person who temporarily works in a construction site and contractually assumes before the employer, the commitment to carry out all or part of the work, according to the scope established in the project or contract, using equipment, machinery and/or labor. of work, own or subcontracted.

Personal Protective Equipment (PPE)

- The set of elements and devices for personal use to protect the worker from accidents and illnesses, which could be caused by agents or factors generated by the performance of their work activities, and that according to the risk to which the workers are exposed. workers, it can be basic or specific.
- When the risk analysis establishes the need to use work clothes with specific protection characteristics, this will be considered as personal protection equipment. (18001, 2010)

Basic Personal Protective Equipment

- Those elements and devices for personal use to protect the worker against the risks to which it is exposed during the execution of its exploitation activities.

Specific personal protective equipment

- Those elements and devices for personal use to protect the worker against additional risks to which he is exposed, due to the execution of dangerous jobs.

Reference level

- The surface considered as the base for measuring the height of the work plane.

Construction

- Demolition, excavation, foundation, construction, installation, finishing activities, among others.

Pattern

- The physical or moral person in whom the responsibility of executing the construction work falls, through the services of one or several workers under their charge.

Danger

- Situations in the work environment, determined by the characteristics or intrinsic properties of chemical or physical agents, or by unsafe conditions, in which damage may occur.

Work permit

- The authorization document issued by the person in charge of safety and hygiene, for the entry, management and development of activities in the work. It is granted to carriers, contractors and subcontractors.

Occupational health and safety policy

- The reference framework for the definition of the objectives and goals in terms of safety and health at work in the construction site, determined by the person in charge of it for the protection of life, physical integrity and health of workers.

Workplace health and safety program

- The document that contains the set of preventive and corrective actions to be implemented to avoid occupational risks in construction works, which may affect the life, physical integrity and health of workers, or cause damage to their facilities. Said instrument describes the activities, methods, techniques and safety conditions that must be observed in each phase of the mining work, which will have, where appropriate, specific safety manuals or procedures.

Supplier

- The physical or legal person who provides services, materials and/or equipment to the employer.

Responsible for the construction work

- The employer or the person designated by him, with the capacity to make decisions, among others, on the direction, execution and surveillance of actions in the field of safety and health at work.

Risk

- The correlation between the danger of an agent or physical condition and the exposure of workers, with the possibility of causing adverse effects to their physical integrity, health or life, or damaging the workplace.

Signaling

- The set of elements used in work areas, to warn workers and external personnel, about the location of emergency equipment or facilities; the existence of risks or dangers, if applicable; the performance of a mandatory action, or the prohibition of an act likely to cause a risk.

Preventive health and safety services at work

- Those provided by trained personnel, internal, external or mixed, whose main purpose is to prevent occupational accidents and illnesses, by complying with regulations on occupational health and safety. Inmates are understood to be those provided by the employer or personnel of the mining work; external, those provided by personnel independent of the mining works, and

mixed, those provided both by internal personnel and by personnel independent of those who work on the construction site.

Damage severity

- The potential evaluation of the impact that unsafe agents or conditions in the work environment can generate or cause, in terms of injury and damage to the worker or to the facilities.

Subcontractor

- The natural or moral person who contractually assumes before the contractor, the commitment to carry out certain activities or phases of the construction work, using their own equipment, machinery and/or labor, according to the scope established in the contract.

Work at height

- Maintenance, installation, demolition, operation, repair, cleaning activities, among others, that are carried out at heights greater than 1.80 m above the reference level. It also includes the risk of falling into openings in work surfaces, such as perforations, shafts, shafts and vertical tunnels.

Dangerous works

- Those carried out in mining works, in which the worker is exposed to additional risks to those of the construction activities carried out, such as those carried out in excavations.

Security

- Aim to prevent accidents at work.

Hygiene

- It seeks to avoid occupational diseases.

Occupational diseases

- Slow and gradual deterioration of the worker's health on occasions or as a consequence of the conditions in which his work is carried out.

Work accidents

- Bodily injury suffered by a worker on occasion or as a consequence of work.

ant theft

- It is the theft of small objects that the employee occupies at home.

This safety and hygiene manual will be carried out once the data with the number of accidents that occurred in the past 5 years have been obtained. To carry out the safety and hygiene manual, the data provided by the company will be taken into account and with all the information collected, the parameters mentioned above will be carried out. With the results obtained, it is intended to have greater control in safety and hygiene measures.

METHODOLOGY

Daily Check Program

This check will be daily as for the entry and exit of the employees of the different shifts and areas of the company, to guarantee a better performance of the company. These check-ups must be for everyone without excuse and will be carried out by a team trained for the check-up.

The check will be carried out at the time of entry of the personnel:

- 1.- A superficial disinfection will be carried out on the person, so that they do not carry any virus with them.
- 2.-The temperature will be taken.
- 2.1.-If you have a temperature, you will be sent to the nurse so that he can determine whether or not it is convenient to work. And a COVID-19 test will be performed
- 2.1.1.-If you are in serious condition, you will have to be transferred immediately to the hospital, for a better diagnosis.
- 3.-The breathalyzer will be performed
- 4.-The blood pressure will be taken and the pupils that are not dilated will be checked to see if they consume any chemical substance in the body.
- 5.-You will be checked to carry all your PPE. Properly.
- 5.1.-In case the person is not wearing their PPE. You will not be let down, and you will be sent home for the missing PPE.
- 6.-You will have to go through a machine that detects metals, when entering and leaving.
- 7.-Your bag will be checked as your backpack or backpack of the person, to:
 - 7.1.-That he does not have any firearm.
 - 7.2.-That it does not carry harmful substances to the body or drugs.
 - 7.3.-In the event that one of these two things is found, it will be handed over to the police.

The check when the person leaves:

- 1.-They will be disinfected superficially
- 2.- You will have to go through a machine that detects metals, when entering and leaving.
 - 2.1.-It will be checked that they do not carry materials from the mineral company.
 - 2.2.-It will be checked that there is no company tool:

- 2.2.1.-The tool that you carry must have a permit to remove it.
- 2.2.2.-If you do not have a permit, the tool will be withdrawn and with a warning.
- 2.2.2.1.-If you find many warnings, you will be sent to a committee for a suspension or dismissal from work

Table 1. Accidents by months.
Analysis of deadly Accidents 2018-2022(As of December 31, 2022)

| MONTHS | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------|-----------|-----------|-----------|-----------|------------|
| JAN. | 2 | 4 | 6 | 5 | 4 |
| FEB. | 6 | 6 | 1 | 2 | 3 |
| SEA. | 9 | 5 | 1 | 7 | 3 |
| APR. | 2 | 6 | 1 | 2 | 1 |
| MAY. | 4 | 1 | 1 | 0 | 6 |
| JUN. | 2 | 4 | 3 | 2 | 2 |
| JUL. | 5 | 4 | 7 | 1 | 2 |
| AUG. | 5 | 4 | 2 | 2 | 3 |
| SET. | 3 | 5 | 2 | 2 | 4 |
| OCT. | 8 | 2 | 0 | 3 | 1 |
| NOV. | 4 | 4 | 1 | 3 | 2 |
| DEC | 4 | 2 | 7 | 0 | 3 |
| TOTAL | 54 | 47 | 32 | 29 | 3.4 |

Table 2. Accidents by days

| DAYS | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------|-----------|-----------|-----------|-----------|------------|
| MONDAY | 3 | 8 | 5 | 4 | 2 |
| TUESDAY | 5 | 5 | 5 | 3 | 6 |
| WEDNESDAY | 9 | 1 | 3 | 4 | 5 |
| THURSDAY | 10 | 10 | 3 | 4 | 4 |
| FRIDAY | 9 | 6 | 4 | 7 | 11 |
| SATURDAY | 9 | 7 | 7 | 4 | 2 |
| SUNDAY | 9 | 10 | 5 | 3 | 4 |
| TOTAL | 54 | 47 | 32 | 29 | 3.4 |

Table 3. Accidents by type

| BY TYPE | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------------------|-----------|-----------|-----------|-----------|------------|
| DESP. OF ROCKS | 9 | 10 | 9 | 9 | 5 |
| TRANSIT | 11 | 6 | 8 | 4 | 0 |
| INTOX.-CHOKING | 4 | 4 | 1 | 3 | 1 |
| COLLAPSE-BURIED | 2 | 2 | 5 | 0 | 0 |
| COLLAPSE-SLIP. | 2 | 0 | 0 | 2 | 9 |
| ELECTRICAL POWER | 3 | 3 | 1 | 1 | 1 |
| MANIP. MATER. | 2 | 2 | 1 | 0 | 0 |
| OPER. LOAD AND DOWNLOAD | 2 | 0 | 0 | 1 | 1 |
| PERSONAL FALLS | 8 | 3 | 2 | 4 | 3 |
| OTHER TYPES | 4 | 4 | 2 | 2 | 4 |
| CARR. AND TRANSP. | 0 | 3 | 0 | 1 | 4 |
| EXPLOSIVES | 2 | 4 | 0 | 0 | 0 |
| TOOLS | 3 | 0 | 0 | 0 | 1 |
| OPER. MACHINE. | 2 | 6 | 3 | 2 | 5 |
| ROCK BURST | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 54 | 47 | 32 | 29 | 3.4 |

Expected Benefits

With the aforementioned, it is expected to have greater control over employees at the time of their entry and exit, having the following points as benefits.

- Decrease in thefts
- Increased worker efficiency
- Greater entry and exit control
- Obtaining a lower spread of diseases among the work personnel

- Obtaining that workers try to wear their work personal protective equipment (PPE) during their working hours
- Preventing the company from suffering monetary losses
- Instill professional ethics in the worker
- Significantly reduce work accidents RESULTS

Table 4. Accidents by Occupation

| BY OCCUPANCY | 2018 | 2019 | 2020 | 2021 | 2022 |
|------------------------|-----------|-----------|-----------|-----------|-----------|
| OTHERS | 4 | 5 | 4 | 2 | 2 |
| ASSISTANT | 5 | 5 | 4 | 2 | 2 |
| HELP. OTHERS | 1 | 1 | 0 | 1 | 1 |
| driller | 5 | 8 | 2 | 4 | 4 |
| OH. DRILL. | 5 | 0 | 2 | 5 | 5 |
| OPER. EQ. HEAVY | 5 | 3 | 3 | 4 | 4 |
| ELECTRICIAN | 3 | 1 | 0 | 0 | 0 |
| DRIVER | 4 | 2 | 2 | 3 | 3 |
| ENG. CHIEF GUARD/MINES | 1 | 1 | 2 | 0 | 0 |
| OPERATOR | 0 | 1 | 3 | 1 | 1 |
| PAWN | 1 | 2 | 0 | 0 | 0 |
| OPER. EQ. STATIONARY | 2 | 1 | 0 | 0 | 0 |
| MECHANIC | 3 | 2 | 2 | 0 | 0 |
| BIKER | 1 | 3 | 0 | 1 | 1 |
| TEACHER | 2 | 5 | 3 | 2 | 2 |
| SUPERVISOR | 3 | 2 | 1 | 2 | 2 |
| OPE. WINCH/INFILL | 2 | 1 | 0 | 0 | 0 |
| WELDER | 2 | 0 | 0 | 0 | 0 |
| WORKER | 2 | 4 | 3 | 2 | 1 |
| LAMPER | 1 | 0 | 0 | 0 | 0 |
| LOGGER | 0 | 0 | 1 | 0 | 0 |
| TOTAL | 52 | 47 | 32 | 29 | 28 |

CONCLUSION

Once the aforementioned has been carried out, it is expected that entry and exit control over workers will increase, increasing their efficiency at work and thus avoiding the transmission of diseases (covid-19). Otherwise, there will be a greater number of thefts, monetary losses and illnesses in the companies, which would give them a very bad image.

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