



ZERO FATALITY STANDARD – ZFS No.7 EXPLOSIVES WORK

3rd Version – December 2023

PURPOSE OF THE STANDARD

This standard establishes the requirements for work with explosives, as well as indicating the minimum content to be considered in the procedures of Colbun and the Collaborating Companies.

This standard applies to the storage, transport, use, handling and destruction of explosives.

Work with explosives is considered to include open-cast blasting and blasting in the interior.

GUIDELINES

1. REQUISITOS ASOCIADOS A LOS TRABAJOS

1.1. COMPANY REQUIREMENTS

The following conditions must be met:

- a. Certification for Working with Explosives: Companies must be certified in accordance with Law 17.798.
- b. Subcontracting Approval: Subcontracted work must receive prior approval from Colbun.

1.2. REQUISITOS DE COMPETENCIA

Personnel handling explosives must meet the following requirements:

- a. Valid Explosives Handler's License: Issued by Carabineros de Chile or the Armed Forces Garrison Commands.
- b. Valid Programmer's License: Also issued by Carabineros de Chile or the Garrison Commands of the Armed Forces.
- c. Supervisor or Foreman Experience: The site Supervisor or Foreman must demonstrate proven experience in explosives work.

2. EQUIPMENT AND FACILITIES REQUIREMENTS

2.1. WORK AREA REQUIREMENTS

The work area for handling explosives must meet the following conditions:

Storage Area Requirements (Fixed or Mobile Powder Magazine):

- a. Storage Authorization: Must be issued by the Directorate General for National Mobilization.
- b. The storage area must remain closed, access-restricted, and guarded by qualified personnel. Entry is permitted only to those holding an explosives handler's license.

Explosives Work Area Requirements:

- a. Blasting Protocol: A blasting protocol, authorized by a licensed programmer, must be in place and include the following:
 - i. Date and time of the blast.
 - ii. Specific sector and location of blasting.

- iii. Calculation report, if applicable.
 - iv. Blasting sequence.
 - v. Type and quantity of explosives to be used.
 - vi. Volume of material to be blasted.
 - vii. Area demarcation details, including type and location of barriers.
 - viii. Roster of personnel performing critical tasks ("live parrot" work).
 - ix. Closure Protocol specifying post-blasting conditions (e.g., remaining shots, environmental status).
- b. Area Delimitation and Signage: The blasting area must be clearly demarcated, signposted, and access restricted per the Blasting Protocol.
 - c. Notification to Personnel: Personnel within the blasting area must be informed of the blasting schedule at least two days in advance.
 - d. Community Notification: Notify the community of the blasting date and time.
 - e. Safety Verification: Ensure all non-involved personnel have vacated the area to the designated safety zone before handling explosives.
 - f. Loading Configuration: The Supervisor or Foreman must verify that the loading configuration complies with the Blasting Protocol.
 - g. Explosives Stock: Maintain only the necessary quantity of explosives in the work area.
 - h. Inspection for Blast Impact: Ensure the area is clear of materials or equipment that could be affected by the blast.
 - i. Check for Remaining Shots: Ensure no unexploded charges remain. Any remaining shots must be detonated before further drilling, following the specific procedure.
 - j. Straggler Shot Book: Maintain a record indicating the date, location, quantity, disposal methods, and signatures of the responsible supervisor for stray shots.

2.2. EQUIPMENT AND WORKING TOOLS REQUIREMENT

Equipment and tools used in explosives work must be inspected for functionality and meet the following requirements:

- a. Original Containers: Explosives must remain in their original, sealed, and undamaged containers.
- b. Authorized Transport Vehicles: Vehicles and equipment used for transporting raw materials or preparing explosives must be authorized by Carabineros de Chile or the Armed Forces Garrison Commands and possess a valid Free Transit Guide.
- c. Grounding of Transport Vehicles: Vehicles used to transport explosives must be properly grounded.
- d. Separation of Explosives and Detonators: Explosives must be transported separately from detonators and securely fastened. If transported in the same vehicle, they must be confined separately.
- e. Preventive Maintenance Plan for Underground Work: For underground operations, a maintenance plan for gas-emitting equipment must be in place to prevent hazardous atmospheres.

3. ACTIVITY DEVELOPMENT REQUIREMENTS

The activity must comply with the following planning and control measures:

- a. Colbun and the contractor/subcontractor must establish a communication protocol appropriate to the scale of the blasting operations.
- b. The contractor/subcontractor must conduct documented inspections of explosive storage facilities.

4. RECORDS

[Use Checklist No. 7 to verify compliance Zero Fatalities Standards-Colbun S.A.](#)

EXCEPTIONS

Previous to the start of work, Colbun's Facility Manager (Project, Power Plant) may authorize exceptions to this Standard in writing. Should there be a discrepancy where there is more than one Facility Manager, it must be escalated to a higher hierarchical level for definition.