

RAC

Critical Activities Requirements



RAC Training Guidelines Reference to PTP-000813

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VALER - EDUCAÇÃO VALE



Valer's Message

Dear Ladies and Gentlemen,

Vale believes that Life Matters Most is a non-negotiable value. For sustainable achievement of this value ensuring all Vale employees are protected from harm, the systemic requirements that represent the health and safety management system have been established.

To support the implementation of actions focused on preventing fatalities, some requirements for execution of critical activities with Vale were established by PTP-000813. In this Technical Process Standard (TPS), the requirements for mandatory training are defined for each critical activity. Vale, together with the Health and Safety Department, has defined the Guidelines for Educational Training for critical activities. It has been documented in order to standardize and ensure minimum required controls are applied.

Vale is acting globally on loss prevention, to ensure that health and safety controls are in place to mitigate the risk of events that may harm people, and damage assets and the company's reputation. In doing so, Vale is working towards being recognized worldwide as a model of excellence in the management of Occupational Health and Safety, through its structure, procedures, policies and results.

“ I count on the commitment from all of you to build together an even more efficient, lean and consistently effective company. For this, we should not ignore health and safety, keeping in mind our value Life Matters Most and the importance of practicing Genuine Active Care. ”



Murilo Ferreira
Chief Executive Officer

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Goals of this Document

PTP-000813 includes established critical requirements for the implementation of critical activities, among them training requirements aimed at:

- » Developing an understanding of risk.
- » Increasing the capacity to anticipate and prevent incidents.

Consequently, this document presents the mandatory minimum requirements for the implementation of training requirements defined in these guidelines and from any applicable regulatory standards.

Parties Involved in the Creation of this Document

This document was developed by Valer - Vale Education and the Health and Safety Department, in a partnership with regional Education and Health and Safety teams within the business.

Scope of this Document

Brazil

This document must be applied throughout Vale Brazil, including service contractors.

For other companies where Vale holds any interest, its application is recommended.

International Areas

Valer - Vale Education and the Health and Safety Department recommend using this document as a basis for development of training guidelines while adhering to local legislation.

Training Strategy

The training requirements presented in this document apply to the management of risk related to critical activities, not the required skills training to perform the function (such as mobile equipment operator, electrician, scaffolding assembler).

It is essential that employees have previous technical knowledge, as well as the necessary certifications and qualifications for the activities they will be expected to perform.

RAC for Professionals Performing Critical Activities

Educational Solution

The educational program consists of both theoretical and practical training requirements. This program enables the learning process by means of presentation of concepts, procedures and resources used in planning and execution of critical activities.

Training program content should include:

- » identification of risks, control measures and safe behaviors for each type of critical activity;
- » shared examples of situations that can potentially result in incidents, for analysis and discussion;
- » demonstration and handling, whenever possible, of protective equipment recommended to the critical activity;
- » use of measurement instruments in simulated situations;
- » use of illustrations, graphical representations and videos showing safe behaviors and behaviors that need attention.

Implementation of Training Actions

Mapping the Target Audience

Only qualified professionals who will perform critical activities will be identified in PTP-000813.

Training employees who do not perform critical activities is not recommended, in order to avoid:

- » unauthorized execution of critical activities by employees who are not required to routinely perform them;
- » displace an employee who requires training;
- » unnecessary costs.

Attention!

For Vale units where the VES system is implemented, the RAC training courses must be included to the employee's training plan so that the frequency of training and reviews can be monitored. Do not include requirements/items out of context.

Instructor's Minimum Requirements

The minimum requirements for training instructors include:

- » a specific technical training knowledge of the training activity been taught;
- » a background and proven experience in H&S as it applies to the operational area(s), of at least two (2) years;
- » Vale instructor: registered by the Educational Agents Training Program;
- » service provider instructor or an instructor from a company providing training: proven experience as an instructor or certified in teacher training courses or equivalent;
- » high school diploma;
- » values being an instructor;
- » identified as an employee who demonstrates consistency with Vale's values.

Validation of instructor technical knowledge and proficiency/experience

The pre-qualifications can be determined through documentation, such as:

- » certificate of technical capacity;
- » records on work permit and/or labor contract;
- » managers' statements (via email or other documented means);
- » certificate for conducting training in the area;
- » technical knowledge assessment;
- » etc.

The technical evidence must be specific to the subject-matter that the instructor will deliver in the classes.

Note:

There is no requirement for knowledge proof to the approval of the instructor. This decision must be made by those responsible for the areas of Health, Safety and Education, according to the local requirements.

RAC Training Schedule

The training can be made available in the following ways:

- » to Vale employees, through Vale internal instructors;
- » to service providers, through their internal instructors; or
- » to Vale employees and service providers, through Vale training provider company.

To ensure that training is most effectively performed, it is recommended that the number of participants per class does not exceed 25 attendants, except for

RAC 02, where the recommendation is a maximum of 12 attendants per class.

At Vale, training scheduling must be coordinated between the business areas and the local H&S and Education teams. Consideration should be given to the contents defined in the standard material and specific contents are addressed as a single action.

Attention!

Some RAC training curriculum requirements do not provide any mandatory refresher training, i.e., they do not have an expiration date. As follows: Basic First Aid, Respiratory Protection, Work Permit, Classified Area, and First Aid - Advanced.

Training Instructor Assessment

The regional areas of Education and Health and Safety should jointly assess and authorize training providers considering the following criteria:

- » record, in their bylaws, of performance in the education and/or training area;
- » instructors with profile previously mentioned in this document;
- » quality of supplementary educational material, if any;
- » capability to meet the described regional training demand.

All these criteria must be analyzed before the final register of the training provider.

The contractors through their responsible technician must ensure procedure similar to that adopted at Vale.

Standard Teaching Material

Vale has internally developed teaching materials to implement the RAC training requirements.

For Vale, the use of teaching materials is mandatory for all internal and external instructors, being essential to ensure that the minimum content is addressed.

For contractors, we recommend the use of Vale's teaching material, which is fully available for use, covers the entire minimum content, is appropriate to the course duration defined in this document and was carefully developed to meet every characteristic of the whole RAC training audience.

Each RAC training course is provided with a kit containing any necessary resources for instructors to deliver classes, which is comprised of:

- » instructor's presentation with teaching resources, considering the task complexity, such as: games, videos, 3D pieces and graphical representations;
- » instructor's guide with class schedule;
- » graph representing any associated risks and prevention measures, to be printed and handed to all learners.

The regional Educational area should provide the instructor:

- » suggested question list for assessing the learners' learning;
- » course evaluation;
- » attendance list.

Teaching Material - Specific Contents

The specific content of each area/local (such as procedures, emergency response plan, rules) is part of the workload established in this document. The standard teaching material was developed to meet this need too.

The identification of issues and development of materials using the templates available in the standard material is the responsibility of the Health and Safety areas, which can count on the support of the regional Education area.

For training Vale employees, the specific material must be disseminated to the internal instructors and training providers, along with the standard teaching materials.

For training service providers, the specific material must primarily be delivered in the introduction of adaption at Vale.

It is essential that the instructor is aware of these specific contents so that he/she can, throughout the training, correlate theory with practice, by giving examples, guidelines and make participants reflect about them.

Practical Simulation Environments

We consider that practice simulation environments are key to strengthening changes in behavior, so we encourage that these structures are available.

Importantly, the regional Health and Safety area is responsible for ensuring compliance with applicable Health & Safety requirements to the environment, and that the basic guidelines, before exposed the simulated environment participants, are always covered.

Assessing the Learning

The instructor is responsible for preparing questions (based on the question list), printing them, applying the mandatory learning assessment at the end of each training course, and correct them.

The learning assessment must contain 10 questions, so that there is no need to adjust the grade.

For a learner be approved, he/she is expected to achieve a score equal to or above 80% of assessment. If he fails to achieve the required score, he/she should repeat the training. Approval is also conditioned to full attendance to training activities.

If the employee is not approved, there is no limit of attempts, however, he can not perform the critical activity prior to approval, as established in PTP-000813.

Course Evaluation

At the end of each RAC training the instructor must necessarily hand out a standard course evaluation form from Valer, which must be delivered in the regional Education area.

The analysis of the course evaluation results is the responsibility of the regional Health & Safety and Education areas. Such analysis is critical to the continuous improvement of training, teaching materials and the performance of instructors (feedback, training and recognition), whether internal or external, and ensures the applicability of the content and quality of teaching.

RAC training requirement management at Vale

Corporate Valer and Health and Corporate Health and Safety Department are responsible for setting this guideline, curricula and teaching materials.

The regional Education area, together with the Health and Education business areas, are responsible for planning the implementation and providing training activities, taking into account each region particularities, the existing infrastructure and the employees to be taught.

The Human Resources Department area is responsible for tabulation and generating codes for training areas in Vale's Educational System - VES.

In Brazil, where VES is the official system working, the management of training information, evidence and reports are obtained from the system.

Where VES is not the official system, the official system adopted by companies for training information management, with record of evaluation of learning and attendance lists duly registered, must be used.

The training records required by law must be observed.

Contractors

Compliance with the content, course duration, learning evaluation and the required profile of trainers in this document is required.

We once more recommend use Vale's teaching material, as described above.

We believe that these guidelines contribute to broaden the perception of risks and the prevention of incidents and fatalities, ensuring that Life Matters Most and the engagement of all stakeholders.

Training Curricula

See next, the complete table with the training contents and their respective training tasks for Vale's Critical Activities Requirements:

SYLLABUS	TRAINING	WORKLOAD	REVIEW	
			WORKLOAD	FREQUENCY
RAC 01 Work at Heights	Risk Prevention in Work at Heights	8h	8h	Two years and occur the specific situations described in the Training Action
RAC 02 Automobile Vehicles	Defensive Driving Theory	4h	4h	Five years
	Defensive Driving Practice	4h	4h	
RAC 02 Automobile Vehicles – Occasional Driver	Online Defensive Driving	2h	-	One year
RAC 03 Mobile Equipment	Basic First Aid	2h	-	Not applicable
	Risk Prevention in Mobile Equipment	4h	4h	Three years
RAC 04 Lockout and Tagout	First Aid – Basic	2h	-	Not applicable
	Risk Prevention in Lockout and Tagout	4h	4h	Three years
RAC 05 Lifting of Loads	First Aid – Basic	2h	-	Not applicable
	Risk Prevention in Lifting of Loads	4h	4h	Three years

SYLLABUS	TRAINING	WORKLOAD	REVIEW	
			WORKLOAD	FREQUENCY
RAC 06 Confined Spaces – Entry Supervisor	First Aid – Advanced	8h	-	Not applicable
	Respiratory Protection	2h	-	Not applicable
	Work Permit	4h	-	Not applicable
	Classified Area	2h	-	Not applicable
	Risks Prevention in Confined Space for Entry Supervisors	24h	8h	A year and whenever occur the specific situations described in the Training Action
RAC 06 Confined Spaces – Observer and Authorized Employee	First Aid - Basic	2h	-	Not applicable
	Respiratory Protection	2h	-	Not applicable
	Risk Prevention in Confined Space for Attendant and Authorized Employees	12h	8h	A year and whenever occur the specific situations described in the Training Action
RAC 09 Explosives	First Aid - Basic	2h	-	Not applicable
	Risks Prevention in Explosives	4h	4h	Five years
RAC 10 Basic Working with Electricity	First Aid – Advanced	8h	-	Not applicable
	Explosive Atmospheres	2h	-	Not applicable
	Risks Prevention in Electricity	30h	8h	Two years and whenever occur the specific situations described in the Training Action
RAC 10 Works with Electricity Supplementary – Power Electrical Systems (PES) Safety - and Surroundings	Power Electrical Systems (PES) Safety	40h	8h	Two years and whenever occur the specific situations described in the Training Action
RAC 11 Molten Metal	First Aid - Basic	2h	-	Not applicable
	Risks Prevention in Molten Metal	4h	4h	Three years

Notes:

There is no specific training for authorizing RAC 07 and 08. Employees working in activities where there are any risks related to machinery protection and ground stability must be provided with guidance about the risks and control measures during their basic training for the function.

Training Actions

As follows, the detailed RAC training actions.

Basic First Aid

Workload:

2 hours

Learning goals:

At the end of training, the employee should be able to:

- I. Describe and perform any basic first aid procedures on injured people.
- II. Describe and perform any necessary procedures to contact the emergency response staff.

Syllabus:

- » Overall Emergency Concepts
- » Basic Life Support (CPR & AED)
- » Responding to an Emergency
- » Checking the Injured Person
- » Recovery Position
- » Rescuing and Moving People

First Aid – Advanced

Workload:

8 hours

Learning goals:

At the end of training, the employee should be able to:

- I. Describe and perform any basic first aid procedures on injured people.
- II. Name the different types of clinical emergency presented.
- III. Apply the techniques and procedures necessary to obtain basic life support.
- IV. Correctly apply the concepts and procedures of specific first aid for each type of emergency.
- V. Correctly apply the concepts and procedures for cases of severe bleeding.
- VI. Correctly apply the procedures and techniques to move incident victims.
- VII. Correctly apply the procedures and health care techniques in simulated emergency situations.

Syllabus:

- » Basic Life Support (CPR & AED)
- » Responding to an Emergency
- » Checking the Injured Person
- » Recovery Position
- » Choking (Conscious Victim)
- » Heart Attack and Chest Pain
- » Preventing Disease Transmission
- » Bleeding and Wound Care
- » Shock
- » Burns
- » Serious Injuries
- » Bones, Joints and Muscles Injuries
- » Sudden Illnesses
- » Poisoning and Intoxication
- » Cold and Heat-Related Emergencies
- » Rescuing and Moving Victims

Work Permit**Workload:**

4 hours

Learning goals:

At the end of training, the employee should be able to:

- I. Explain the importance of the work permit
- II. Describe the prerequisites for approval of a work permit.
- III. Analyze and validate the information contained in the work permit.
- IV. Approve or reject a work permit.

Syllabus:

- » Importance of Work Permits
- » People Responsible for Issuing and Releasing the Work Permit
- » Prerequisites for Approval of Work Permit
- » Permit to Perform the Activity

- » Analysis and Validation of Work Permit
- » Approval of Work Permit

Risks Prevention in Working at Heights

Note:

The Basic First Aid classes required by RAC-01 - Working at Heights of the PTP-000813 is already being addressed in this training syllabus.

Workload:

8 hours

Review frequency:

Two years, or whenever any of the following situations occur:

- a. change in the procedures, in the conditions or in the work operations;
- b. and event that indicates the need for a new training;
- c. return to work after a period exceeding 90 days of absence;
- d. company changes.

Attention!

In the refresher training motivated by the situations "a", "b", "c" and "d", the course duration and syllabus must meet the needs of the situation that triggered them.

Learning goals:

At the end of training, the employee should be able to:

- » Define the concepts related to work at height.
- » Name and describe the function of the basic equipment used for work at height.

Syllabus:

- » Concepts
- » Equipments to Work at Heights Scaffolding
 - Elevated work platforms
 - Personnel hoisting equipment
 - Ladders
 - Roof Walkaway
 - Suspended Scaffolding
 - Access by rope

» Safety Equipment – Safety Harness

- Double lanyard
- Retractable safety line
- Fixed retractable line
- Lifelines
- Access by rope

» Risks and Risk Prevention Measures

- Prevention measures
- Risk assessment
- Typical incidents

» Rules and Regulations

» First Aid - Basic

Defensive Driving Theory

Workload:

4 hours

Refresher training periodicity:

Five years

Learning goals:

At the end of training, the employee should be able to:

- I. List the individual and collective benefits of incident prevention by means of preventive direction.
- II. Identify different hazards associated with the operation of automotive vehicles.
- III. Describe the importance of using safety equipment and inspection of the vehicle conditions.
- IV. Create strategies to decrease the number of incidents related to automotive vehicles condition.
- V. Apply the concepts, requirements and safety procedures related to vehicles operation.

Syllabus:

» Overall Concepts

- Vehicles on surface mining areas and on public roads
- Vehicles in underground mining areas
- Vehicles in areas of mineral exploration

- » Safety Devices
- » Risks and Prevention Measures
 - Associated Risks
 - Contributing Factors
 - Prevention measures
 - Typical incidents
- » Defensive Driving
 - Definition
 - Safety Distance X Braking Space
 - Weight Transfer Dynamic X Vehicle Stability
 - Predictability of hazard/early response
 - Cautions when driving at night
 - Cautions with pedestrian
 - Drivers' responsibilities
 - Blind spot
 - Alcohol intake, phones and driving
- » Internal Traffic Plan
- » Rules and Regulations

Defensive Driving Practice

Workload:

4 hours

Review frequency:

Five years

Learning goals:

At the end of training, the employee should be able to:

- I. Apply the concepts, requirements and safety procedures related to vehicles operation.

Syllabus:

- » Initial Vehicle Check
- » Correct Positioning Inside the Vehicle X Adjustments of Benches and Equipment
- » Steering Control Exercises X Slalon with Obstacles (Hand Position)
- » Braking Control Exercises X Safety Distance (Dry and Wet Track)
- » Use of ABS Brakes on Regular and Irregular Fields

Online Defensive Driving

Course duration:

2 hours

Review frequency:

One year

Learning goals:

At the end of the training, the employee must:

- I. Describe general concepts related to automotive vehicles.
- II. Identify hazards and act in advance to avoid accidents.
- III. Use properly safety equipment.
- IV. Apply the legislation, requirements and safety procedures related to vehicles driving.

Syllabus:

- » Risks, Contributing Factors and Prevention Measures
- » Safety Devices
- » Safety Devices
- » Braking Distance
- » Predictability of Hazard and Early Response
- » Blind Spot
- » Alcohol, Mobile Phone and Driving
- » Taxi Service and Car Rental

Risks Prevention in Mobile Equipment

Workload:

4 hours

Review frequency:

Three years

Learning goals:

At the end of training, the employee should be able to:

- I. Define general concepts related to mobile equipment.
- II. Identify the basic equipment used in activities with mobile equipment.
- III. List the individual and collective benefits of preventing incidents with mobile equipment.

- IV. Identify and control the risks associated with the movement area with mobile equipment.
- V. Identify the different risk situations associated with mobile equipment operation and activities performed in mobile equipment.
- VI. Apply the concepts, requirements and safety procedures during activities of pre-operation, operation and maintenance of mobile equipment.
- VII. Improve safety practices of the professionals in activities performed with mobile equipment.

Syllabus:

- » Mobile Equipment and Safety Devices
 - Surface mobile equipment
 - Underground mine mobile equipment
 - Safety Devices
- » Risks and Prevention Measures
 - Associated Risks
 - Prevention measures
 - Typical incidents
- » Operator's Responsibilities
- » Rules and Regulations

Risks Prevention in Lockout and Tagout

Workload:

4 hours

Review frequency:

Three years

Learning goals:

At the end of training, the employee should be able to:

- I. Define the concepts about the hazards and consequences associated with the types of energy.
- II. Identify the basic equipment used in the lockout of each type of energy.
- III. List the individual and collective benefits of incident prevention by proper performance of procedures involving lockout and tagout of the various energy sources.
- IV. Identify the different hazards associated with activities involving lockout and tagout of specific types of energy.
- V. Improve safety practices of the professionals in activities involving lockout and tagout.
- VI. Execute lockout and tagout activities following the procedures and specific safety practices for each type of energy source.

Syllabus:

- » Concepts
- » Lockout Devices
 - Definition
 - Types of devices
 - Lockout tags
- » Risks and Prevention Measures
 - Risks
 - Prevention measures
 - Typical incidents
- » Lockout and Tagout Stages
- » Rules and Regulations

Risk Prevention at Lifting Loads

Workload:

4 hours

Review frequency::

Three years

Learning goals:

At the end of training, the employee should be able to:

- I. Define general concepts related to load lifting
- II. Identify the types of equipment, mooring and accessories..
- III. Name the basic equipment for lifting of loads.
- IV. List the individual and collective benefits of incident prevention by proper performance of procedures involving load lifting.
- V. Identify hazards and control risks and consequences associated with activities that involve lifting of loads.
- VI. Identify the different hazards associated with activities involving lifting of loads.
- VII. Improve safety practices of the professionals in activities performed at lifting loads.

Syllabus

- » Concept
- » Equipment and accessories
 - Safety Devices
 - Crane
 - Overhead crane
 - Monorail
 - Electric hoist
 - Accessories
- » Risks and prevention measures
 - Typical incidents
- » Load Lifting Plan
- » Types of Mooring
- » Rules and Regulations

Respiratory Protection

Workload:

2 hours

Learning goals:

At the end of training, the employee should be able to:

- I. Define the concepts related to respiratory protection.
- II. Explain the importance of using and inspection of Respiratory Protective Equipment (RPE).
- III. List the legal requirements on the use of RPE.
- IV. Describe the operation of RPEs.
- V. Name and explain the measures for collective and administrative control related to the use of RPE.
- VI. Identify the different hazards and associate them to the emergency situations regarding respiratory protection.
- VII. Describe and properly execute the procedures and safety practices related to respiratory protection.

Syllabus:

- » Respiratory Protection and Hazards Involved.
- » Importance of Using Respiratory Protection.

- » Effect of incorrect use of the Respiratory Protective Equipment to the Human Body.
- » Operation, characteristics and limitations of the Respiratory Protective Equipment.
- » Correct use of the Respiratory Protective Equipment.
- » Recognition of Emergency Situations.
- » Legal Requirements on the use of RPEs.
- » Collective Control Measures and Administrative Control Measures.

Classified Area

Workload:

2 hours

Learning goals:

At the end of training, the employee should be able to:

- I. Recognize a classified area.
- II. Identify all hazards relating to work at classified area.
- III. Describe and properly execute procedures to control risks of works in Explosive Atmospheres.

Syllabus:

- » Concept of Classified Area.
- » Legal and Technical Aspects Relating to Classified Areas.
- » Classified Area Criteria.
- » Recognizing Hazards in Classified Areas.
- » Risk Control Measures and Criteria of Equipment Use Indication in Classified Areas.

Risk Prevention in Confined Space – For Entry Supervisors

Workload:

24 hours

Review frequency:

One year and whenever there is one of the following situations:

- a. change in the procedures, conditions or work operations;
- b. any event that indicates the need for a new training;
- c. when there is reason to believe that there are deviations in the use or procedures for access to confined spaces or that the knowledge is not suitable.

Note:

The reviewed contents must be defined by the area and the situation where applicable, including the contents for the actions of the initial training.

Learning goals:

At the end of training, the employee should be able to:

- I. Provide concept on confined space.
- II. List the individual and collective benefits of preventing accidents in confined spaces.
- III. Name any communication methods within the staff in a confined space
- IV. Identify hazards and control the risks through control measures in the activities performed in confined space
- V. Perform activities following the procedures and the specific safety practices in confined spaces.
- VI. Apply the concepts, requirements and safety procedures related to work in confined space.
- VII. Improve safety practices of the professionals in activities performed in confined space.e.

Syllabus:

- » Overall Concepts
 - Identification of confined spaces
 - Examples of typical confined spaces
 - Signaling and isolation
- » Risk Acknowledge, Assessment and Control
 - Associated Risks
 - Classified Area
 - Protective equipment
 - Safe practices in confined spaces
- » Risk Control Equipment
 - Gas measurement
- » Respiratory Protection Program
- » Occupational Health and Safety Law
- » Basics of Rescue
- » First Aid

Risk Prevention in Confined Space For Observer and Authorized Employee

Workload:

12 hours

Review frequency:

One year, or whenever any of the following situations occur:

- a. change in the procedures, conditions or work operations;
- b. any event that indicates the need for a new training;
- c. when there is reason to believe that there are deviations in the use or procedures for access to confined spaces or that the knowledge is not suitable

Note:

The reviewed contents must be defined by the area and the situation where applicable, including the contents for the actions of the initial training.

Learning goals:

At the end of training, the employee should be able to:

- I. Provide concept on confined space.
- II. Identify the staff responsibilities regarding the acknowledgment, assessment and, control of risks in confined spaces.
- III. List the individual and collective benefits of preventing accidents in confined spaces.
- IV. Name any communication methods within the staff in a confined space.
- V. Identify hazards and control the risks through control measures in the activities performed in confined space.
- VI. Describe the importance of inspection and use of PPE and CPE in confined spaces.
- VII. Apply the concepts, requirements and safety procedures related to work in confined space.
- VIII. Improve safety practices of the professionals in activities performed in confined space.

Syllabus:

- » Overall Concepts
 - Identification of confined spaces
 - Examples of typical confined spaces
 - Signaling and isolation
- » Risk Acknowledge, Assessment and Control
 - Associated Risks
 - Protective equipment
 - Safe practices in confined spaces

- » Risk Control Equipment
 - Gas measurement
- » Occupational Health and Safety Law
- » Procedures and Use of Access and Work Permit
- » Basics of Rescue
- » First Aid

Refresh Training - Risk Prevention in Confined Space

Workload:

8 hours

Learning goals:

At the end of training, the employee should be able to:

- I. I. Provide concept on confined space.
- II. II. Identify the staff responsibilities regarding the acknowledgment, assessment and control of risks in confined spaces
- III. III. List the individual and collective benefits of preventing accidents in confined spaces.
- IV. IV. Describe the importance of inspection and use of PPE and CPE in confined spaces.
- V. V. Apply the concepts, requirements and safety procedures related to work in confined space.
- VI. VI. Improve safety practices of the professionals in activities performed in confined space

Syllabus:

- » Overall Concepts
 - Identification of confined spaces
 - Examples of typical confined spaces
 - Signaling and isolation
- » Risk Acknowledge, Assessment and Control
 - Associated Risks
 - Classified Area
 - Protective equipment
 - Safe practices in confined spaces
- » Respiratory Protection Program
- » Basics of Rescue

Risks Prevention in Explosives

Course duration:

4 hours

Refresher training periodicity:

Five years

Learning goals:

At the end of training, the employee should be able to:

- I. Define all overall concepts relating to specific explosive detonation.
- II. List the individual and collective benefits of preventing incidents involving detonation and handling of explosives with application of safety procedures.
- III. Identify different hazards to safely perform the planning and performance of activities involving storage and handling of explosives
- IV. Identify and prevent the occurrence of defects after explosive detonation.
- V. Describe the importance of conducting the inspection of transport and installation of explosives.
- VI. Improve safety practices of the professionals in activities with explosives.

Syllabus:

- » » Overall Concepts
 - Definition
 - Classification, composition and types
 - Detonation accessories
- » » Risks and Prevention Measures
 - Associated Risks
 - Facilities
 - Manufacturing
 - Storage
 - Handling and transportation
 - Loading of holes and detonation
- » Typical Accidents in Works with Explosives
- » Traffic Plan
- » Rules and Regulations

Risk Prevention in Electricity

Workload:

30 hours

Review frequency:

Two years, or whenever any of the following situations occur:

- a. change in function or company;
- b. return to work or inactivity for more than three months;
- c. significant changes in the electrical installation or exchange of methods, processes and work organization.

Learning goals:

At the end of training, the employee should be able to:

- I. List the individual and collective benefits of preventing incidents in works with electricity
- II. Identify different hazards associated with works with electricity.
- III. Describe the importance of using safety equipment and during the execution of works with electricity.
- IV. Create strategies to decrease the number of incidents related to works with electricity.
- V. Apply the concepts, requirements and safety procedures related to work with electricity.
- VI. Improve safety practices of the professionals in activities with electricity.

Syllabus:

- » Introduction to Safety with Electricity
- » Hazards in Facilities and Services with Electricity
 - Electric shock, mechanisms and effects
 - Electric arc; burns and fall
 - Electromagnetic fields
- » Risk Assessment Techniques

- » Electricity Risk Control Measures
 - De-energization
 - Protective temporary grounding systems (TN/TT/IT)
 - Bonding
 - Power automatic sectioning
 - Residual-current circuit breaker
 - Extra low voltage
 - Barriers and enclosures
 - Lockout and impediments
 - Obstacles and shielding
 - Live part insulation
 - Double or reinforced insulation
 - Out of reach placement
 - Electrical separation
- » Technical Standards
- » Regulations
- » Collective Protection Equipment
- » Personal Protection Equipment
- » Work Routines - Procedures
 - De-energized installations
 - Release for work
 - Signaling
 - Inspection of areas, services, tooling and equipment
- » Documentation of Electrical Facilities
- » Additional Hazards
 - Height
 - Confined spaces
 - Classified areas
 - Moisture
 - Weather conditionss
- » Fire Fighting and Protection
 - Basics
 - Preventive measures
 - Fire extinguishing measures
 - Practice

Power Electrical Systems Safety

Nota:

It is a prerequisite for attending this training action having participated in actions with satisfactory score in the training on RAC 10 - Risk Prevention in Electricity.

Workload:

40 hours

Review frequency:

Two years, or whenever any of the following situations occur:

- a. change in function or company;
- b. return to work or inactivity for more than three months;
- c. significant changes in the electrical installation or exchange of methods, processes and work organization.

Learning goals:

At the end of training, the employee should be able to:

- I. List the individual and collective benefits of incident prevention in Power Electrical Systems - PES.
- II. Identify hazards associated with works in PES.
- III. Describe the importance of using safety devices.
- IV. Create strategies to decrease the number of incidents related to works in PES.
- V. Apply the concepts, requirements and safety procedures related to work with PES.
- VI. Improve safety practices of the professionals in activities with PES.

Syllabus:

- » Arrangement of Power Electrical Systems - PES
- » Labor Organization
 - Service scheduling and planning
 - Team work
 - Records and registration of facilities
 - Working methods
 - Communication
- » Behavior Aspects
- » Service Hindering Conditions

- » Typical PES Risks and Prevention
 - Proximity and contact to live parts
 - Induction
 - Atmospheric discharges
 - Statics
 - Electrical and magnetic fields
 - Communication and identification
 - Works at heights, special machinery and equipment
- » Risk Assessment Techniques in PES
- » Labor Procedures - Analysis and Discussion
- » Techniques of Working with electricity
 - In live line
 - To the potential
 - Outdoors
 - Remote work
 - Night work
 - Underground work
- » Equipment and Tools for Work (Choice, Use, Conservation, Checking Testing)
- » Collective Protection Systems
- » Postures and Working Clothing
- » Safety with Vehicles and Transportation of People, Materials, and Equipments
- » Signaling and Isolation of Work Areas
- » Release facility for service, operation and use
- » Training on Techniques for Removal, Emergency Care and Displacement of Incident Victims
- » Typical incidents
- » Responsibilities

Refresh Training - Risk Prevention in Electricity

Workload:

8 hours

Review frequency:

Two years and whenever there is one of the following situations:

- a. function change or change of company;
- b. return to work or inactivity for more than three months;
- c. significant changes in the electrical installation or exchange of methods, processes and work organization.

Learning goals:

At the end of training, the employee should be able to:

- I. I. List the individual and collective benefits of preventing incidents in works with Electricity and PES.
- II. II. Identify hazards associated with works with electricity
- III. III. Describe the importance of using safety devices.
- IV. IV. Create strategies to decrease the number of incidents related to works with electricity.
- V. V. Apply the concepts, requirements and safety procedures related to work with electricity and PES.
- VI. VI. Improve safety practices of the professionals in activities with electricity and PES.

Syllabus

- » Overall Concepts
- » Hazards in Facilities and Services with Electricity
- » Additional Hazards
- » Risk Assessment Techniques
- » Electricity Risk Control Measures
- » Collective Protection Equipment
- » Personal Protection Equipment
- » Release facility for service, operation and use
- » Work Routines - Procedures
- » Documentation of Electrical Facilities
- » Rules and Regulations

Risks Prevention in Molten Metal

Workload:

4 hours

Review frequency:

Three years

Learning goals:

At the end of training, the employee should be able to:

- I. Define general concepts related to molten metal.I.
- II. Identify any safety requirements of systems and facilities with molten metal.
- III. List the individual and collective benefits of preventing incidents with molten metal.
- IV. Identify hazards and control risks and consequences associated with activities that involve molten metals.

Programmatic content:

- » Overall Concepts
 - Definition
 - Characteristics
- » Types of Installations and Systems
- » Risks and Prevention Measures
 - Associated Risks
 - Prevention measures
 - Personal Protection Equipment
 - Typical incidents
- » Rules and Regulationsns

RAC for Immediate Supervisors

Educational Solution

This educational solution aims at the development of immediate supervisors line managers of employees working on critical activities every day. The work load is 8 hours.

Training program content should include:

- dynamics reinforcing the role of leading employees working on critical activities;.
- shared cases of fatalities and situations that can potentially result in incidents, for analysis and discussion;
- use of illustrations, graphical representations and videos showing safe behaviors and behaviors that need attention.

Syllabus:

- » Concepts
- » Number of Fatalities per Year
- » Number of Fatalities per RAC
- » Incident Rate
- » Examples of Catastrophic Accidents in Companies
- » RAC Situations

Implementation of Training Requirements

Mapping the Target Audience:

Only qualified leaders who will perform critical activities will be identified in PTP-000813.

Only leaders complying with the above requirement should be trained, in order to avoid:

- displace an employee who requires training;
- unnecessary costs.

Instructor's Minimum Requirements:

The minimum requirements for training instructors include:

- Technical knowledge on RACs in a more systemic/broader way.
- A background and proven experience in H&S as it applies to the operational area(s), of at least two (2) years.
- Vale instructor: registered by the Educational Agents Training Program.
- Service provider instructor or an instructor from a company providing training: proven experience as an instructor or certified in teacher training courses or equivalent.
- Values being an instructor.
- Identified as an employee who demonstrates consistency with Vale's values.

Validation of instructor technical knowledge and proficiency/experience

The pre-qualifications can be determined through documentation, such as:

- certificate of technical capacity;
- records on work permit;
- managers' statements (via email or other documented means);
- certificate for conducting training in the area;
- technical knowledge assessment;
- etc.

RAC Training Schedule

The training can be made available in the following ways:

- to Vale employees, through Vale internal instructors; or
- to service providers, through their internal instructors.

To ensure that training is most effectively performed, it is recommended that the number of participants per class does not exceed 25 attendants, except for more effective training.

At Vale, the training offer should be planned by business areas together with local H&S and Education teams

Standard Teaching Material

Vale provides a teaching material developed internally for implementing this effort.

For Vale, the use of this teaching material is mandatory for all internal and external instructors, being essential to ensure that the minimum content is addressed. It is available to download at VES.

For contractors, we recommend the use of Vale's teaching material, which is fully available for use, covers the entire minimum content, is appropriate to the course duration defined in this document and was carefully developed to meet every characteristic of the whole RAC training audience.

Each RAC training course is provided with a kit containing any necessary resources for instructors to deliver classes, which is comprised of:

- activity for advance preparation on the topic, to be sent by the instructor to learners;
- instructor's presentation with teaching resources, considering the task complexity, such as: games, videos, 3D pieces, graphical representations and self-assessment for leaders;
- instructor's guide with class schedule

The local Education area should provide the instructor:

- reaction evaluation;
- attendance list.

Learner's Course Evaluation

At the end of each training class, the instructor must necessarily hand out a standard course evaluation form from Valer, which must be delivered in the regional Education area.

The analysis of the course evaluation results is the responsibility of the regional Health & Safety and Education areas, being key to continuously improving training courses, teaching materials and guide instructors - feedback, training and recognition, ensuring the applicability of the content and quality of teaching.

RAC training requirement management at Vale

Corporate Valer and Health and Corporate Health and Safety Department are responsible for setting this guideline, curricula and teaching materials.

The regional Education area, together with the Health and Education business areas, are responsible for planning the implementation and providing training activities, taking into account each region particularities, the existing infrastructure and the employees to be taught.

The HR Solution Center is responsible for tabulation and generating codes for training areas in Vale's Educational System - VES.

In locations where VES is the official system working, the management of training information, evidence and reports are obtained from the system. This procedure was validated by the Health and Safety audit regulatory area.

In companies where VES is not the official system, the official system adopted by companies for training information management.

Contractors

Compliance with the content, course duration and the required profile of trainers in this document is required.

We once more recommend use Vale's teaching material, as described above.