



Purpose: To establish guidelines and guidance for the integrated management of potential risks which Vale System entities are exposed.

Scope:

- This policy applies to Vale, its wholly owned (100%) subsidiaries and shall be reproduced to its direct and indirect, subsidiaries in Brazil and in other countries, always respecting these companies' constitutional documents and the applicable laws. Adoption of this policy is encouraged in other entities in which Vale has a participation interest in Brazil and in other countries. This group of entities, for the purposes of this Policy, is referred to as "Vale System".

References:

- POL-0001-G – Code of Conduct
- POL-0005-G – Human Rights Policy
- POL-0012-G – Climate Change Policy
- POL-0016-G – Anti-Corruption Policy
- POL-0019-G- Sustainability Policy
- POL-0025-G – Sanctions Compliance Policy
- POL-0032-G – Water and Water Resources Policy
- POL-0033-G – Policy for provision of audit services by the independent auditor
- POL-0035-G - Vale Management Model Policy - Vale Production System - "VPS"
- POL-0036-G - Diversity and Inclusion Policy
- POL-0037-G – Policy for Dam Safety and Geotechnical Mining Structures
- POL-0040-G – Mining and Metallurgical Waste Management Policy

Principles and Guidelines:

The risk management should:

- Support strategic planning, budget and sustainability of the business of Vale's System.
- Strengthen capital structure and asset management of Vale's System, by including concepts and assumptions of management based on the risks from operations, maintenance and assets and logistics modes.
- Strengthen Vale's governance practices, based on the lines of defense model.
- Consider concepts of ISO 31000, ISO 55000 and COSO-ERM as references for risk management. For Operational Safety, adopt the RBPS (Risk Based Process Safety) as the operational safety management system.
- Measure and monitor Vale's System potential risks, on a consolidated basis, considering the effect of diversification, when applicable, of its whole business.
- Establish a specialized structure for specific and independent performance, as 2nd Line of Defense Specialist, in the assessment of potential operational risks, including geotechnical risks.
- Assess the impact of new investments, acquisitions and divestitures on Vale's System risk map and risk tolerance.

Risk Concept:

- Risk is the effect of uncertainty on the organizational objectives that manifests itself in many ways, with potential impact on all business dimensions.
- In the entities of Vale's System, risks are categorized as Business risks, Corporate Process risks and Process risks. The classification of the risk event in each of these categories is based on the dimensions of the Severity Table, and the Executive Board must propose the limits of classification to the Board of Directors, when necessary or on demand by the Board itself. Risks must be properly recorded in the Risk Management System, by the 1st Line of Defense, according to their category.



- Business Risks are the relevant potential risks that, in the event of an occurrence, may impact people, communities, the environment, operational continuity, reputation and the achievement of the company's general business objectives and strategy.
- Corporate Process risks are those related to possible deviations in transactional corporate processes, without possibility of significant impacts on the company's strategic objectives. In addition, such risks include the functions of Marketing and Sales, Assets (management of fixed assets), Human Resources, Finance, Information Technology, Supplies, Legal and Tax, not exhaustively.
- The Corporate Process risk should be classified as a business risk, when it has an impact on the "Reputational" and / or "Financial" dimensions at a Moderate or greater severity level.
- The identified risks where an impact assessment, by the risk owner, does not have any dimension above Very Low and Low should not be considered as Business Risk, and consequently there is no obligation to register it in the Business Risk Management System.
- The risks of Operational Processes emanate from the company's production process. They are usually related to the failure of the physical integrity of assets and process equipment and are characterized by the unplanned or uncontrolled release of hazardous material or energy.
- Operational Process risk should be classified as Business Risk, when it has an impact on the "People" and / or "Environment" dimensions at a Very Critical severity level.

Integrated Risk Map:

- The Integrated Risk Map is a non-exhaustive tool, that contains the set of potential risks proposed by Executive Board and approved by the Board of Directors, which needs to be assessed and monitored in all Vale units in the different geographies of your operational, commercial, project, support and administrative areas. Such risk themes are set out in the Integrated Risk Map in categories, including, but not limited to People, Sustainability, Institutional Relations and Reputation, Strategic, Cyber, Financial, Planning and Operational Continuity, Geotechnics and Compliance.
- Periodically, at least once a year or when requested, the risks should be evaluated and validated by Vale's Board of Directors, by recommendation of the Executive Board, and may be maintained, reviewed, excluded or included in the Integrated Risk Map.

Risk Matrix:

- The Risk Matrix contains the risk classification based on a combination of two factors: Probability and Severity of events. This combined analysis establishes a risk priority scale, with each event being classified as Very High, High, Medium or Low. Such a method allows comparisons among potential risk events, allowing prioritization for preventive risk treatment.
- The Severity and Probability tables are tools that help to assess risk events in perspective and, prioritize their preventive treatment. Such documents aim to minimize the subjectivities and standardize the evaluations, making them comparable and enabling the compliance with applicable legal requirements for business risk scenarios, operational process risks and corporate process risks.
- The Severity table is used to assess the progressive severity of impacts in different dimensions including People, Environment, Social and Human Rights, Reputational and Financial.
- The Probability table is used to statistically estimate the theoretical probability of occurrence of a risk, as long as a rationale that can be audited is used. In other situations, the risk owner (1st Line of Defense) should evaluate the probability of the risk event's occurrence, being necessary to define the rationale used.
- The 2nd Specialist Defense Line is responsible for approving the prevention and mitigation plan proposed by the 1st Defense Line for all events with a Very Critical severity level arising from HIRA, regardless of any probability criteria. It is important to note that the HIRA (Hazard Identification Risk Assessment) is the official process for identifying and classifying operational and geotechnical risks.
- It is the responsibility of the 1st Line of Defense, through indicators and controls, to ensure that the action plans established to prevent or mitigate risks, whatever their classification, are being implemented within the deadline, prioritizing actions that lead to reduction severity.
- POL-00037 (Safety Policy for Dams and Geotechnical Mining Structures) describes other processes for assessing and mitigating geotechnical risks (as well as their approval levels) that are additional to HIRA, such as Engineer Records (EoR).



- The Executive Board is responsible for proposing to Vale's Board of Directors the Risk Matrix and the Severity Table.
- Approval of the Probability Table (s) is delegated to the Executive Board.

Risk Tolerance Matrix:

- The Risk Tolerance Matrix establishes the strategy and governance to be followed in response to risks, based on the event classification in the Risk Matrix.
- The Executive Board is responsible for proposing to the Vale Board of Directors the risk tolerance limit for each priority level in the Risk Matrix, establishing the strategy and governance in response to risks.
- The Executive Board should provide, through human, financial and other resources, by approvals under their authority limits, the necessary support to the 1st and 2nd Lines of Defense to reduce or eliminate risks classified at "Mandatory Reduction of Risk Level" level in the Risk Matrix and to evaluate that the risks at continuous monitoring level have effectiveness of controls and timeliness of action plans by:
 - (i) additional mitigation and prevention actions;
 - (ii) transfer or sharing, in total or in part, the risk or;
 - (iii) risk rejection, for example through a temporary or definitive closure of a plant or shutdown of an activity.
- For risks classified as "Continuous Monitoring" in the Risk Tolerance Matrix, the risk owner (1st Line of Defense) must evaluate the effectiveness of controls and the timeliness of action plans aiming at managing risk with respect to its prevention and mitigation.
- For other classification levels of Risk Tolerance Matrix, the risk owner (1st Line of Defense) must control and prevent through critical control elements (barriers), manage through the safety process system and/or monitor through proactive and reactive indicators, and, request support from the 2nd Line of Expert Defense whenever consider necessary.

Risk Management Governance Structure:

- Vale has an integrated Risk Management Governance flow, which is based on lines of defense model, establishing how revaluations are periodically carried out, aiming the alignment between strategic decisions, performance, definition and monitoring of risk tolerance limits approved by the Board of Directors, by proposing of Executive Board.

General Governance:

- The Board of Directors has advisory committees that, as provided for in the Bylaws, which among other duties, are responsible to oversee the scope and the effectiveness of business risk management by the Executive Board in accordance with the guidelines established by Vale's Board of Directors.
- The Business Risks Executive Committees, established by Vale's Board of Directors, are divided into five (5) committees with different scope of action: (i) Operational Risks, (ii) Geotechnical Risks, (iii) Strategic, Financial and Cybernetics Risks, (iv) Compliance Risks and (v) Sustainability, Institutional Relations and Reputational Risks. The committees act preventively and have the mission to support Vale's Executive Board in monitoring the risks and in their deliberations accordingly to this policy.
- The Business Risks Executive Committees should:
 - Promote the culture of business risk management in the company.
 - Support the 1st Line of Defense on additional requests for human, financial and other resources to proper manage and prevent potential risks, and, in particular, to the reduce or eliminate risks classified at "Mandatory Risk Level Reduction" and for the effectiveness controls and timeliness of action plans for the risks classified at continuous monitoring level.
 - Support Vale's Executive Board to monitor operational, geotechnical, strategic, financial, cyber , compliance, sustainability, institutional relations, reputational, people, planning and operational continuity risks and issue preventive recommendations regarding potential risks presented at the meetings of these committees.
 - Recommend reviews on risk management principles and tools, aimed to continuous process improvement.
 - Evaluate and suggest, when necessary, changes on the strategy of business risk management for subsequent approval by the Executive Board.



- Provide the Executive Board with a consolidated macro view of the exposure to potential risk of Vale's System in categories of the Integrated Risk Map: People, Sustainability, Institutional Relations and Reputation, Strategic, Cyber, Financial, Planning and Operational, Operational Continuity, Geotechnics and Compliance, as appropriate, and assist in the development of the Risk Management Multi-Annual Investments Plan.

Vale's Executive Board:

- Monitor business risks management systematically.
- Promote the culture of business risks in the organization and the empowerment of 1st and 2nd Lines of Defense.
- Define which areas of the organization will act as 2nd Specialist Defense Line.
- Provide, through human, financial and other resources, by approvals under their authority limits, the necessary support for the 1st and 2nd Lines of Defense to reduce or eliminate risks classified at "Mandatory Risk Level Reduction" level in the Risk Matrix and to permit that the risks at "Continuous Monitoring" level have effectiveness of controls and timeliness of action plans by:
 - (i) additional mitigation and prevention actions;
 - (ii) transfer or sharing, in total or in part, the risk or;
 - (iii) risk rejection, for example through a temporary or definitive closure of a plant or shutdown of an activity.
- Approve the Probability Table (s), for a minimum period of 3 years.
- Propose the assessment and validation, by the Board of Directors of Vale, of the themes of the Integrated Risk Map and the Risk Management Multi-Annual Investments Plan, considering the consolidated need for current investment, with a minimum annual periodicity.
- Propose to Vale's Board of Directors the revision of the risk management tables and matrices listed below, with a minimum period of 3 years:
 - Severity Table, including the criteria for classifying the risk event in the categories Business Risk, Corporate Process Risk and Operational Process Risk.
 - Risk Matrix
 - Risk Tolerance Matrix for each priority level of the Risk Matrix
 - Strategy and Governance Tables in response to risks

1st Line of Defense:

- The 1st Line of Defense is composed of the executors of the Company's operational and business processes, they are responsible for registering the risks identified in the entire chain of the operating model; for managing risks; for implementing risk management controls and their respective action plans.
- It consists of the risk owners, who are directly responsible for keeping the risks within the tolerance limits defined at Vale; by the owners of controls, responsible for the implementation of preventive and mitigative controls, which are assigned to them by the owner of the risks; and by the executors of the processes in the operational, commercial, project, support and administrative areas.
- The 1st Line of Defense must share and provide technical and methodological support regarding the standards and guidelines for safety and risk management established in Vale's operations with contracted suppliers.
- Every business risk identified by the 1st Line of Defense must be attributed to a risk owner, with a minimum position of Manager

Responsibilities of Risk Owners:

- Operate and maintain the integrity and the reliability of assets, and develop and implement the performance of assets from operations, projects, support and administrative activities. Must immediately stop the asset(s) operation in case of critical deviations or in the event of complete unavailability of critical control elements that move the risk to "Mandatory Risk Level Reduction" priority level.
- Proactively implement and execute, any mitigation or elimination actions that consider necessary, to transfer, share or reject risks at "Mandatory Risk Level Reduction" level.
- Manage risks directly, identifying, assessing, treating, preventing and monitoring risks in an integrated manner.



- Continuously assess the applicability of risks in the Integrated Risk Map to the activities and geographies under their responsibility.
- Recommend adjustments in the Integrated Risk Map when considered necessary and register potential risks, including if they don't fit in with the existing risks presented in the map.
- Monitor the compliance of risks in order to attend external regulations, policies and internal standards.
- Ensure the effectiveness of controls and the timeliness of action plans, especially of the risks classified in the "Continuous Monitoring" and "Mandatory Reduction" levels .
- When considered necessary, to evolve in the preventive or mitigative treatment of the risks under your responsibility, it may request additional support in its hierarchical line or the 2nd Specialist Defense Line, as well as guide the monitoring of risk with the competent Business Risk Executive Committee.
- In the event of risks that present threats of materialization, the risk owner must immediately and proactively take the preventive and mitigative actions, which he considers appropriate, with no need to obtain prior authorizations. Subsequently, if any support or ratification by levels higher than what has been observed in practice is necessary, the request must be forwarded to the corresponding department or function, according to the governance of the response established in the Strategy and Governance in Response to Risks Tables.
- In the event of risks that present threats of materialization and is also a "Mandatory Risk Level Reduction" risk, the owner of the risk must assume higher decision-making powers for approval emergency measures. Subsequently, such measures, if adopted, must be reported to the respective Executive Director and submitted for ratification at the competent authority according to the Delegation of Authority Policy - (POL-0002-G)
- Establish and implement Crisis Management protocols and Business Continuity plans for the risk events under their responsibility, classified with severity Very Critical and Critical, and, for other risks whenever applicable. For risks with impacts Very Critical and Critical, drills should be performed in order to verify the efficiency and effectiveness of the Crisis Management protocols. The frequency of the drills should be defined by the owner risk according to the criticality, considering local rules and specific legislation and according to internal normative documents, always following the most restrictive term.
- Comply with the guidelines, minimum technical and management standards defined by the 2nd lines of defense.
- Periodically monitor the risk management indicators in order to manage the effectiveness of the controls and plans associated with the risks under your responsibility.
- Evaluate corrective action plans, proposals for continuous improvement of controls and / or implementation of new controls suggested by control owners, aiming at the risk management continuous improvement.
- Follow Vale's budget guidelines to obtain the necessary resources for risk management.
- Certify (sign off), approving in the Risk Management System the formalization of risk and any subsequent structural changes, such as reevaluation of causes, structure of controls and other elements.

Responsibilities of Control Owners:

- Manage the preventive and mitigative controls that the first line required, always ensuring the accuracy and timeliness of the information and security of the process, in accordance with the applicable legislation, internal policies and standards, and seek a correction of the controls, in case of protection of some deficiency.
- Perform or review the control tests, respecting the frequency defined in the control. It is recommended that all evidence of the Very High and High residual risk test be obtained from the Risk Management System, so that it can be subsequently verified by the 2nd line of defense specialist and / or 3rd line of defense.
- Mobilize the risk owner in case of deficiencies found in control verification tests, which have an impact on risk prevention or mitigation, especially in the case of controls.
- Elaborate and / or associate action plans for controls that do not work or with the necessary execution to seek the effectiveness and feasibility for the control to work.
- Monitor the execution and timeliness of action plans related to controls, as well as sustaining investments when associated with them.
- To certify (sign off), approving in the Risk Management System the formalization of control and any structural alteration in it.



2nd Line of Defense:

Enterprise Risk Management (ERM) - Business Risks Integrated Management:

Regarding business risks management, the Enterprise Risk Management (ERM) structure has the following responsibilities:

- Develop and implement policies, methodologies, processes, infrastructure and the integrated communication system so that business risk management takes place at Vale in a standardized way.
- Support the 1st Line of Defense by providing training and methodological tools for Business Risk Management model.
- Support and promote the exchange of knowledge and information in order to disseminate the risk management and risk prevention culture in Vale.
- Support and monitor the compliance with business risks governance model.
- Support external disclosure of official business risks management information.
- Report information about the Integrated Risk Map to Vale's Business Risks Executive Committee(s) meetings, considering the status of controls and business risk action plans.
- Consolidate the decisions of Business Risks Executive Committees for submission to the Executive Board, as well as follow up the accomplishment of recommendations, being responsible of the 2nd Lines of Defense Specialists to assess their technical effectiveness of such recommendations, when applicable.

The Enterprise Risk Management (ERM) area will report to the Finance and Investor Relations Executive Director.

Safety and Operational Excellence – Operational Risks Management:

For the purposes of this Policy, operational risk management, under the responsibility of Safety and Operational Excellence department, corresponds to the performance as 2nd Line of Defense Specialist on potential risks with impacts on the People dimension, as well as on potential geotechnical risks, whose responsibilities are:

- Act as technical responsible for the definition of standards and rules for management of Occupational Safety, industrial and geotechnical processes and asset integrity.
- Act as the normative and inspector area for the critical assets¹ management process.
- Keep an integrated management system and consistency in application of standards and operational good practices management.
- Monitor and present the risks of operational processes with a level of Critical severity, in the forums indicated by the Operational Excellence and Risk Committee.

In addition to the responsibilities described above, the areas from Safety and Operational Excellence Department have the responsibilities, as follows bellow, from 2nd Lines of Defense Specialist.

2nd Line of Defense Specialist:

In addition to the Safety and Operational Excellence department, which is the 2nd Line of Defense for Operational Risks, there are areas such as the Environment, Corporate Integrity, Social and Human Rights, not exhaustively, that should also act as 2nd Line of Defense Specialist for the respective potential risks.

All 2nd Lines of Defense Specialist have the following attributions:

- To act within the corporate guidelines of Risk Management of the Vale's System.
- Define methodologies, minimum technical, technologic and management standards, as well as risks and assets reliability indicators to be mandatorily adopted by the 1st Line of Defense.
- Define the methodology and technical selection criteria of critical control elements.
- Conduct independent checks (evaluation of effectiveness) of ignored controls, related to relevant potential risks, compensation for the 1st Line of Defense. In the exercise of its duties, if any deviation is identified in the existing

¹ As defined in the internal normative documents of the normative area (PNR-000044).



controls and barriers for risks with Very High and High criticality, it has the power to define immediate actions to be implemented by the 1st Line of Defense, being able to take the decision to stop the operation of the assets, when applicable.

- Acting in support of the 1st Line of Defense, by assessing the concepts adopted, verifying whether the risks have mapped controls and whether the barriers implemented are the best in each situation related to relevant potential risks.
- Support the identification of risks, need to implement additional controls and non-conformities of existing controls and issue recommendations, give technical support to the deployment of the model and standards to manage and prevent risks and assets.
- Assess the implementation of standards and indicators by operational, commercial, project, support and administrative areas (1st Line of Defense), with independence and transparency.
- Address relevant potential risks to specific Executive Committees, if preventive actions decisions, which require additional support, are necessary.

The definition of which areas in the organization will perform as 2nd Line of Defense Specialist is delegated to Vale's Executive Board.

3rd Line of Defense:

- The 3rd line of defense is composed of areas with total independence from the administration, that is, the Internal Audit and Whistleblowing Channel which perform, observing their respective scopes, evaluations, inspections, by the execution of controls test and investigations of allegations, providing exempt assurance, including on the effectiveness of risk management, internal controls and compliance.
- Monitoring and evaluation of the effectiveness of the company's key risks management process, as defined by the Board of Directors.
- Evaluation of the effectiveness and efficiency of processes, the applicability of VPS, HIRA standards, among others, as well as compliance with guidelines related to engineering, maintenance, geotechnics and Health & Safety areas, by employing a specialized technical team.
- Monitoring and evaluation of governance, compliance and internal controls processes, including the effectiveness of the activities of the 1st and 2nd Lines of Defense.
- Consulting and advisory services, provided they are intended to add value and improve the governance, risk management and control processes, and the internal auditor does not assume responsibility inherent to the duties of the Process Owners and the 1st and 2nd Lines of Defense.
- Communication to the responsible management and competent governance bodies about exposure to significant risks and control deficiencies.

General Rules:

- Vale's Board of Directors delegates to the Vale's Executive Board the approval to deploy this Policy into rules and responsibilities to manage and control the risks, in order to avoid the occurrence of unwanted accidents of MUE (Material Unwanted Event) 2 and / or materialization of potential risks.
- This Policy shall be reviewed periodically, at least once in every three (3) years or on demand.

² MUE (Material Unwanted Events) it is an unwanted event that has the potential to (i) result in multiple fatalities or (ii) extensive and irreversible environmental impact outside the site or loss of operating license. It is a term derived from the methodology HIRA - Hazard Identification and Risk Analysis, used by operational areas to survey operational risks.