Professional Certificate in MBA in Mining Management

Risk Management in Mining

AISC stands for All-In Sustaining Costs, which is a metric used in the mining industry to represent the total cost of producing an ounce of gold or other commodities, including both direct and indirect costs. Related terms include Cash Costs and Total Cash Costs. AISC is used to provide a more comprehensive view of a mining company's costs and to help investors and analysts understand the company's profitability. For example, a mining company may report an AISC of $900 per ounce of gold, which includes the cost of mining, processing, and selling the gold, as well as other expenses such as general and administrative costs.

Abutment refers to the rock or soil that surrounds a mine opening, such as a tunnel or shaft. Related terms include Pillar and Rib. Abutment is an important concept in mine design and stability, as it helps to support the weight of the overlying rock and prevent collapse. For example, a mining engineer may design a tunnel to include abutment pillars, which are left in place to support the surrounding rock and prevent collapse.

Acid Mine Drainage (AMD) refers to the acidic water that is produced when sulfide-bearing rocks are exposed to oxygen and water. Related terms include Acid Rock Drainage and Neutralization. AMD is a major environmental concern in the mining industry, as it can contaminate waterways and harm aquatic life. For example, a mining company may implement a treatment system to neutralize AMD and prevent it from entering nearby waterways.

Asset Management refers to the process of managing and maintaining a mining company's assets, such as equipment, vehicles, and infrastructure. Related terms include Maintenance and Reliability. Asset Management is critical to ensuring the efficient and safe operation of a mine, as well as minimizing downtime and reducing costs. For example, a mining company may implement a computerized maintenance management system to track and schedule maintenance activities.

Autonomous Haulage System (AHS) refers to a driverless truck system that is used in some mines to haul ore and waste rock. Related terms include Autonomous Vehicles and Teleoperation. AHS is designed to improve safety and efficiency, as well as reduce labor costs. For example, a mining company may implement an AHS system to haul ore from the pit to the processing plant.

Blast Design refers to the process of designing a blast pattern to safely and efficiently break rock. Related terms include Blast Optimization and Fragmentation. Blast Design is critical to ensuring the safe and efficient operation of a mine, as well as minimizing environmental impacts. For example, a mining engineer may use specialized software to design a blast pattern that minimizes noise and vibration.

Breakeven Analysis refers to the process of analyzing the costs and revenues of a mining project to determine the point at which it becomes profitable. Related terms include Cost-Benefit Analysis and Sensitivity Analysis. Breakeven Analysis is used to help mining companies make informed decisions about whether to proceed with a project. For example, a mining company may conduct a breakeven analysis to determine the minimum price of gold that is required to make a project profitable.

Capital Expenditure (Capex) refers to the costs associated with purchasing or upgrading assets, such as equipment and infrastructure. Related terms include Operating Expenditure (Opex) and Sustaining Capital. Capex is a critical component of a mining company's budget, as it is necessary to maintain and expand operations. For example, a mining company may budget $100 million in capex to purchase new equipment and upgrade its processing plant.

Coal Mining refers to the process of extracting coal from the earth. Related terms include Underground Mining and Surface Mining. Coal Mining is a major sector of the mining industry, with coal being used to generate electricity and produce steel. For example, a coal mining company may use room-and-pillar mining to extract coal from a underground deposit.

Computer-Aided Design (CAD) refers to the use of computer software to design and model mining operations, such as tunnels and pits. Related terms include Computer-Aided Manufacturing (CAM) and Geographic Information Systems (GIS). CAD is used to improve the efficiency and accuracy of mine design and planning. For example, a mining engineer may use CAD software to design a tunnel layout and simulate different blasting scenarios.

Condition-Based Maintenance (CBM) refers to the practice of performing maintenance activities based on the actual condition of equipment, rather than on a fixed schedule. Related terms include Predictive Maintenance and Reliability-Centered Maintenance. CBM is used to minimize downtime and reduce maintenance costs. For example, a mining company may use CBM to monitor the condition of its haul trucks and perform maintenance only when necessary.

Cost-Benefit Analysis refers to the process of evaluating the costs and benefits of a mining project or activity. Related terms include Breakeven Analysis and Sensitivity Analysis. Cost-Benefit Analysis is used to help mining companies make informed decisions about whether to proceed with a project. For example, a mining company may conduct a cost-benefit analysis to determine the viability of a new mining project.

Cut-Off Grade refers to the minimum grade of ore that is required to make a mining project profitable. Related terms include Breakeven Grade and Marginal Grade. Cut-Off Grade is used to determine which ore is worth extracting and processing. For example, a mining company may determine that the cut-off grade for a copper deposit is 1% copper, meaning that any ore with a grade below 1% is not worth extracting.

Data Mining refers to the process of analyzing large datasets to identify patterns and trends. Related terms include Data Analysis and Business Intelligence. Data Mining is used in the mining industry to improve operational efficiency and reduce costs. For example, a mining company may use data mining to analyze production data and identify opportunities to improve productivity.

Deposit Model refers to a geological model of a mineral deposit, which is used to estimate the size and grade of the deposit. Related terms include Resource Model and Reserve Model. Deposit Model is critical to the planning and development of a mining project. For example, a mining company may use a deposit model to estimate the size and grade of a copper deposit and determine the optimal mining method.

Dilution refers to the process of mixing ore with waste rock, which can reduce the grade of the ore. Related terms include Ore Loss and Recovery. Dilution is a major concern in the mining industry, as it can reduce the

value of the ore and increase processing costs. For example, a mining company may implement a system to minimize dilution and maximize ore recovery.

Drill and Blast refers to the method of breaking rock using drilling and blasting. Related terms include Mechanical Cutting and Hydraulic Mining. Drill and Blast is a common method of rock breaking in the mining industry. For example, a mining company may use drill and blast to extract ore from a underground deposit.

Economic Evaluation refers to the process of evaluating the economic viability of a mining project or activity. Related terms include Cost-Benefit Analysis and Breakeven Analysis. Economic Evaluation is used to help mining companies make informed decisions about whether to proceed with a project. For example, a mining company may conduct an economic evaluation to determine the viability of a new mining project.

Efficiency refers to the ability of a mining operation to produce ore or minerals at a low cost and with minimal waste. Related terms include Productivity and Effectiveness. Efficiency is critical to the success of a mining company, as it can help to reduce costs and improve profitability. For example, a mining company may implement a system to improve efficiency and reduce waste.

Environmental Impact Assessment (EIA) refers to the process of evaluating the potential environmental impacts of a mining project or activity. Related terms include Environmental Management and Sustainability. EIA is used to identify and mitigate potential environmental risks. For example, a mining company may conduct an EIA to determine the potential impacts of a new mining project on local waterways.

Equipment Maintenance refers to the process of maintaining and repairing equipment, such as haul trucks and loaders. Related terms include Condition-Based Maintenance and Predictive Maintenance. Equipment Maintenance is critical to ensuring the safe and efficient operation of a mine. For example, a mining company may implement a maintenance program to extend the life of its equipment and reduce downtime.

Exploration refers to the process of searching for new mineral deposits or evaluating the potential of existing deposits. Related terms include Prospecting and Geological Mapping. Exploration is a critical component of the mining industry, as it helps to identify new opportunities and replace depleted reserves. For example, a mining company may conduct exploration activities to identify new copper deposits.

Feasibility Study refers to a detailed evaluation of the viability of a mining project, including technical, economic, and environmental factors. Related terms include Pre-Feasibility Study and Bankable Feasibility Study. Feasibility Study is used to determine whether a project is viable and to identify potential risks and opportunities. For example, a mining company may conduct a feasibility study to evaluate the viability of a new mining project.

Financial Modeling refers to the process of creating financial models to evaluate the viability of a mining project or activity. Related terms include Cost-Benefit Analysis and Breakeven Analysis. Financial Modeling is used to help mining companies make informed decisions about investments and financing. For example, a mining company may use financial modeling to evaluate the viability of a new mining project and determine the required investment.

Geographic Information Systems (GIS) refers to the use of computer software to analyze and display geographic data, such as maps and spatial data. Related terms include Computer-Aided Design (CAD) and Remote Sensing. GIS is used in the mining industry to improve planning and decision-making. For example, a mining company may use GIS to create maps of its operations and analyze spatial data.

Geology refers to the study of the earth's physical structure, composition, and processes. Related terms include Geological Mapping and Geophysical Surveying. Geology is critical to the mining industry, as it helps to identify and evaluate mineral deposits. For example, a mining company may conduct geological mapping to identify potential mineral deposits.

Grade refers to the concentration of a mineral or metal in ore. Related terms include Assay and Concentrate. Grade is a critical factor in determining the value of ore and the viability of a mining project. For example, a mining company may determine that the grade of a copper deposit is 2% copper, meaning that for every 100 tons of ore, 2 tons of copper are present.

Gravity Separation refers to the process of separating minerals based on their density, using gravity. Related terms include Flotation and Magnetic Separation. Gravity Separation is a common method of mineral processing, particularly for ores with high density differences. For example, a mining company may use gravity separation to separate copper ore from waste rock.

Hazard Identification refers to the process of identifying potential hazards in a mining operation, such as rockfalls or equipment failures. Related terms include Risk Assessment and Hazard Mitigation. Hazard Identification is critical to ensuring the safety of miners and preventing accidents. For example, a mining company may conduct a hazard identification study to identify potential hazards in its operations.

Hydraulic Mining refers to the method of breaking rock using high-pressure water jets. Related terms include Drill and Blast and Mechanical Cutting. Hydraulic Mining is a common method of rock breaking in the mining industry, particularly for soft rock. For example, a mining company may use hydraulic mining to extract coal from a underground deposit.

Industrial Hygiene refers to the practice of recognizing, evaluating, and controlling occupational health hazards in a mining operation. Related terms include Occupational Health and Safety. Industrial Hygiene is critical to ensuring the health and safety of miners. For example, a mining company may implement an industrial hygiene program to monitor and control exposure to dust and noise.

Information Management refers to the process of collecting, storing, and analyzing data and information in a mining operation. Related terms include Data Mining and Business Intelligence. Information Management is used to improve decision-making and operational efficiency. For example, a mining company may implement an information management system to track production data and analyze trends.

Insurance refers to the practice of transferring risk to an insurer, in exchange for a premium. Related terms include Risk Management and Liability. Insurance is used to mitigate potential losses and protect against unforeseen events. For example, a mining company may purchase insurance to cover against equipment failure or environmental damage.

JORC Code refers to the Australasian Joint Ore Reserves Committee Code, which is a set of standards for reporting mineral resources and reserves. Related terms include NI 43-101 and SAMREC. JORC Code is used to ensure transparency and consistency in reporting mineral resources and reserves. For example, a mining company may use the JORC Code to report its mineral resources and reserves.

Just-In-Time (JIT) refers to the method of producing and delivering products just in time to meet customer demand. Related terms include Lean Manufacturing and Supply Chain Management. JIT is used to minimize inventory and reduce waste. For example, a mining company may implement a JIT system to supply coal to a power plant.

Key Performance Indicator (KPI) refers to a metric used to measure and evaluate the performance of a mining operation, such as production rate or safety record. Related terms include Performance Metrics and Benchmarking. KPI is used to track and improve performance. For example, a mining company may use KPIs to measure and evaluate the performance of its operations.

Leaching refers to the process of extracting metals from ore using a chemical solution. Related terms include Heap Leaching and In-Situ Leaching. Leaching is a common method of metal extraction, particularly for gold and copper. For example, a mining company may use leaching to extract copper from ore.

Life Cycle Assessment (LCA) refers to the process of evaluating the environmental impacts of a mining operation throughout its entire life cycle, from exploration to closure. Related terms include Environmental Impact Assessment and Sustainability. LCA is used to identify and mitigate potential environmental risks. For example, a mining company may conduct an LCA to evaluate the environmental impacts of a new mining project.

Maintenance refers to the process of maintaining and repairing equipment, such as haul trucks and loaders. Related terms include Condition-Based Maintenance and Predictive Maintenance. Maintenance is critical to ensuring the safe and efficient operation of a mine. For example, a mining company may implement a maintenance program to extend the life of its equipment and reduce downtime.

Make-or-Buy Decision refers to the process of deciding whether to produce a product or service in-house or to purchase it from an external supplier. Related terms include Outsourcing and Procurement. Make-or-Buy Decision is used to determine the most cost-effective and efficient option. For example, a mining company may decide to outsource its maintenance activities to a third-party provider.

Material Safety Data Sheet (MSDS) refers to a document that provides information on the safe handling, use, and disposal of a hazardous material. Related terms include Safety Data Sheet and Hazard Communication. MSDS is used to ensure the safe handling and use of hazardous materials. For example, a mining company may use MSDS to provide information on the safe handling of chemicals.

Mine Closure refers to the process of closing a mine at the end of its life, including rehabilitation and reclamation activities. Related terms include Decommissioning and Rehabilitation. Mine Closure is critical to ensuring the safety and environmental sustainability of a mine site. For example, a mining company may develop a mine closure plan to ensure the safe and environmentally responsible closure of a mine.

Mine Planning refers to the process of planning and designing a mining operation, including the extraction of ore and the management of waste rock. Related terms include Mine Design and Mine Scheduling. Mine Planning is critical to ensuring the efficient and safe operation of a mine. For example, a mining company may use mine planning software to optimize its mining operations.

Mineral Resource refers to a concentration of minerals in the earth's crust that can be extracted and processed economically. Related terms include Mineral Reserve and Ore Body. Mineral Resource is a critical component of a mining project, as it determines the potential value of the project. For example, a mining company may estimate the mineral resource of a copper deposit to be 100 million tons.

Mining Method refers to the technique used to extract ore from the earth, such as underground mining or surface mining. Related terms include Extraction Method and Mining Technique. Mining Method is critical to determining the efficiency and safety of a mining operation. For example, a mining company may use room-and-pillar mining to extract coal from a underground deposit.

Net Present Value (NPV) refers to the value of a mining project or investment in today's dollars, taking into account the time value of money. Related terms include Internal Rate of Return and Payback Period. NPV is used to evaluate the viability of a mining project or investment. For example, a mining company may calculate the NPV of a new mining project to determine its viability.

Occupational Health and Safety (OHS) refers to the practice of ensuring the health and safety of workers in a mining operation. Related terms include Industrial Hygiene and Risk Management. OHS is critical to preventing accidents and injuries in the workplace. For example, a mining company may implement an OHS program to monitor and control exposure to dust and noise.

Operating Expenditure (Opex) refers to the costs associated with operating a mine, such as labor, fuel, and maintenance. Related terms include Capital Expenditure (Capex) and Sustaining Capital. Opex is a critical component of a mining company's budget, as it is necessary to maintain and operate the mine. For example, a mining company may budget $50 million in opex to operate its mine.

Ore Body refers to a concentration of ore in the earth's crust that can be extracted and processed economically. Related terms include Mineral Resource and Mineral Reserve. Ore Body is a critical component of a mining project, as it determines the potential value of the project. For example, a mining company may estimate the ore body of a copper deposit to be 100 million tons.

Ore Reserve refers to the portion of a mineral resource that can be extracted and processed economically. Related terms include Mineral Resource and Probable Reserve. Ore Reserve is a critical component of a mining project, as it determines the potential value of the project. For example, a mining company may estimate the ore reserve of a copper deposit to be 50 million tons.

Pit Optimization refers to the process of optimizing the design of a pit to maximize the extraction of ore and minimize waste rock. Related terms include Pit Design and Mine Planning. Pit Optimization is used to improve the efficiency and profitability of a mining operation. For example, a mining company may use pit optimization software to optimize the design of its pit.

Pre-Feasibility Study refers to a study that evaluates the viability of a mining project, including technical, economic, and environmental factors. Related terms include Feasibility Study and Bankable Feasibility Study. Pre-Feasibility Study is used to determine whether a project is viable and to identify potential risks and opportunities. For example, a mining company may conduct a pre-feasibility study to evaluate the viability of a new mining project.

Predictive Maintenance refers to the practice of performing maintenance activities based on predictions of when equipment is likely to fail. Related terms include Condition-Based Maintenance and Reliability-Centered Maintenance. Predictive Maintenance is used to minimize downtime and reduce maintenance costs. For example, a mining company may use predictive maintenance to schedule maintenance activities for its haul trucks.

Process Control refers to the process of controlling and optimizing the production process in a mining operation, including the extraction and processing of ore. Related terms include Process Optimization and Quality Control. Process Control is critical to ensuring the efficient and safe operation of a mine. For example, a mining company may use process control software to optimize its production process.

Production Scheduling refers to the process of scheduling production activities in a mining operation, including the extraction and processing of ore. Related terms include Mine Planning and Pit Optimization. Production Scheduling is used to improve the efficiency and profitability of a mining operation. For example, a mining company may use production scheduling software to optimize its production activities.

Quality Control refers to the process of controlling and optimizing the quality of products in a mining operation, including the extraction and processing of ore. Related terms include Process Control and Quality Assurance. Quality Control is critical to ensuring the quality and value of products. For example, a mining company may use quality control software to monitor and control the quality of its products.

Reclamation refers to the process of rehabilitating a mine site after closure, including the restoration of land and water resources. Related terms include Rehabilitation and Mine Closure. Reclamation is critical to ensuring the environmental sustainability of a mine site. For example, a mining company may develop a reclamation plan to restore a mine site after closure.

Reliability-Centered Maintenance (RCM) refers to the practice of performing maintenance activities based on the reliability of equipment, rather than on a fixed schedule. Related terms include Condition-Based Maintenance and Predictive Maintenance. RCM is used to minimize downtime and reduce maintenance costs. For example, a mining company may use RCM to schedule maintenance activities for its haul trucks.

Reserve Estimation refers to the process of estimating the size and grade of a mineral reserve. Related terms include Mineral Resource and Ore Reserve. Reserve Estimation is critical to determining the potential value of a mining project. For example, a mining company may estimate the reserve of a copper deposit to be 50 million tons.

Risk Assessment refers to the process of identifying and evaluating potential risks in a mining operation, including safety, environmental, and economic risks. Related terms include Hazard Identification and Risk Management. Risk Assessment is critical to ensuring the safety and sustainability of a mining operation. For

example, a mining company may conduct a risk assessment to identify potential risks and develop strategies to mitigate them.

Risk Management refers to the process of identifying, evaluating, and mitigating potential risks in a mining operation, including safety, environmental, and economic risks. Related terms include Risk Assessment and Insurance. Risk Management is critical to ensuring the safety and sustainability of a mining operation. For example, a mining company may develop a risk management plan to identify and mitigate potential risks.

Safety Data Sheet (SDS) refers to a document that provides information on the safe handling, use, and disposal of a hazardous material. Related terms include Material Safety Data Sheet and Hazard Communication. SDS is used to ensure the safe handling and use of hazardous materials. For example, a mining company may use SDS to provide information on the safe handling of chemicals.

Sensitivity Analysis refers to the process of analyzing the sensitivity of a mining project or investment to changes in key variables, such as commodity prices or operating costs. Related terms include Breakeven Analysis and Cost-Benefit Analysis. Sensitivity Analysis is used to evaluate the viability of a mining project or investment. For example, a mining company may conduct a sensitivity analysis to evaluate the impact of changes in commodity prices on its project.

Simulation refers to the process of modeling and analyzing the behavior of a mining operation, including the extraction and processing of ore. Related terms include Modeling and Optimization. Simulation is used to improve the efficiency and profitability of a mining operation. For example, a mining company may use simulation software to model and optimize its production process.

Six Sigma refers to a methodology for improving the quality and efficiency of a mining operation, by identifying and eliminating defects and variations. Related terms include Lean Manufacturing and Quality Control. Six Sigma is used to improve the quality and efficiency of a mining operation. For example, a mining company may implement a Six Sigma program to improve the quality of its products.

Sustainability refers to the practice of ensuring the long-term environmental, social, and economic sustainability of a mining operation. Related terms include Environmental Sustainability and Social Responsibility. Sustainability is critical to ensuring the long-term viability of a mining operation. For example, a mining company may develop a sustainability plan to ensure the long-term environmental and social sustainability of its operations.

Tailings refers to the waste rock and other materials that are left over after the extraction and processing of ore. Related terms include Waste Rock and Tailings Management. Tailings is a major environmental concern in the mining industry, as it can contaminate waterways and harm aquatic life. For example, a mining company may implement a tailings management plan to minimize the environmental impacts of its tailings.

Total Quality Management (TQM) refers to a methodology for improving the quality and efficiency of a mining operation, by involving all employees and stakeholders in the quality management process. Related terms include Quality Control and Quality Assurance. TQM is used to improve the quality and efficiency of a mining operation. For example, a mining company may implement a TQM program to improve the quality of its products.

Value Chain refers to the series of activities and processes that create value in a mining operation, from exploration to production. Related terms include Supply Chain and Value Creation. Value Chain is used to identify and optimize the activities and processes that create value in a mining operation. For example, a mining company may analyze its value chain to identify opportunities to improve efficiency and reduce costs.

Ventilation refers to the system of providing fresh air and removing stale air in a mining operation, to ensure the health and safety of miners. Related terms include Air Quality and Occupational Health. Ventilation is critical to ensuring the health and safety of miners. For example, a mining company may implement a ventilation system to provide fresh air and remove stale air from its mine.

Waste Management refers to the process of managing and disposing of waste materials in a mining operation, including waste rock and tailings. Related terms include Waste Reduction and Recycling. Waste Management is critical to minimizing the environmental impacts of a mining operation. For example, a mining company may implement a waste management plan to minimize the environmental impacts of its waste.

Waste Rock refers to the rock that is removed from a mine during the extraction of ore, but is not processed or sold. Related terms include Overburden and Tailings. Waste Rock is a major environmental concern in the mining industry, as it can contaminate waterways and harm aquatic life. For example, a mining company may implement a waste rock management plan to minimize the environmental impacts of its waste rock.

Water Management refers to the process of managing and conserving water in a mining operation, including the use of water for processing and other activities. Related terms include Water Conservation and Water Recycling. Water Management is critical to minimizing the environmental impacts of a mining operation. For example, a mining company may implement a water management plan to conserve water and reduce its environmental impacts.

X-Ray Fluorescence (XRF) refers to a technique for analyzing the chemical composition of rocks and minerals, using X-ray fluorescence. Related terms include Geochemical Analysis and Laboratory Testing. XRF is used to analyze the chemical composition of rocks and minerals, and to identify potential mineral deposits. For example, a mining company may use XRF to analyze the chemical composition of rocks and identify potential copper deposits.

Yield refers to the percentage of ore that is recovered from a mining operation, compared to the total amount of ore extracted. Related terms include Recovery and Grade. Yield is a critical factor in determining the efficiency and profitability of a mining operation. For example, a mining company may determine that the yield of its copper mine is 90%, meaning that 90% of the ore extracted is recovered and processed.

Zinc Equivalent (ZnEq) refers to a metric that is used to compare the value of different metals, such as copper, lead, and zinc. Related terms include Copper Equivalent and Gold Equivalent. ZnEq is used to evaluate the value of a mining project or deposit, and to compare the value of different metals. For example, a mining company may use ZnEq to evaluate the value of a copper deposit and compare it to the value of a zinc deposit.