2017 Edition

CIA

Preparatory Program

Part 3

Sample

Section II: Risk Management

Brian Hock, CIA, CMA

and

Carl Burch, CIA, CMA

HOCK *international*, LLC
P.O. Box 6553
Columbus, Ohio 43206

(866) 807-HOCK or (866) 807-4625
(281) 652-5768

www.hockinternational.com
cia@hockinternational.com

Published July 2017

Acknowledgements

Acknowledgement is due to the Institute of Internal Auditors for permission to use copyrighted questions and problems from the Certified Internal Auditor Examinations by The Institute of Internal Auditors, Inc., 247 Maitland Avenue, Altamonte Springs, Florida 32701 USA. Reprinted with permission.

The authors would also like to thank the Institute of Certified Management Accountants for permission to use questions and problems from past CMA Exams. The questions and unofficial answers are copyrighted by the Certified Institute of Management Accountants and have been used here with their permission.

The authors also wish to thank the IT Governance Institute for permission to make use of concepts from the publication Control Objectives for Information and related Technology (COBIT) 3rd Edition, © 2000, IT Governance Institute, www.itgi.org. Reproduction without permission is not permitted.

Thanks

The authors would like to thank the following people for their assistance in the production of this material:

- Kekoa Kaluhiokalani for his assistance with copyediting the material,
- Lynn Roden, CMA for her assistance in the technical elements of the material,
- Kevin Hock for his work in the formatting and layout of the material,
- All of the staff of HOCK Training and HOCK *international* for their patience in the multiple revisions of the material,
- The students of HOCK Training in all of our classrooms and the students of HOCK *international* in our Distance Learning Program who have made suggestions, comments and recommendations for the material,
- Most importantly, to our families and spouses, for their patience in the long hours and travel that have gone into these materials.

Editorial Notes

Throughout these materials, we have chosen particular language, spellings, structures and grammar in order to be consistent and comprehensible for all readers. HOCK study materials are used by candidates from countries throughout the world, and for many, English is a second language. We are aware that our choices may not always adhere to "formal" standards, but our efforts are focused on making the study process easy for all of our candidates. Nonetheless, we continue to welcome your meaningful corrections and ideas for creating better materials.

This material is designed exclusively to assist people in their exam preparation. No information in the material should be construed as authoritative business, accounting or consulting advice. Appropriate professionals should be consulted for such advice and consulting.

Section II – Risk Management

This section covers 10–20% of the exam and it is tested at a **proficiency level**. The two primary topics covered in this section are **risk management techniques** and **organizational use of risk frameworks**. Many exam questions can be answered through common sense and from your own experience as an internal auditor.

Risk Management Techniques

In order for an organization to develop a risk management process, it first needs to understand its **risk appetite**, which is the amount of risk the company is able and willing to take on. Once a company establishes its risk appetite, it can implement an appropriate, tailor-made risk management process. This section covers the factors that influence an organization's risk appetite.

Organizational Use of Risk Frameworks

The section covers the methods through which organizations can manage their **financial** and **operational** risks. The discussion focuses on Enterprise Risk Management (ERM), in which a company looks at the organization as a whole in making risk assessments.

IIA. Risk Management Techniques

The IIA defines risk management as "a process to identify, assess, manage and control potential events or situations, and provide reasonable assurance regarding the achievement of the organization's objectives."[5]

The following are two important ideas related to risk management:

- **Risk** is the probability that a future event or action could adversely impact the organization. Risk is measured in terms of the financial impact (in dollars) and the likelihood (or probability) of an event occurring.
- **Risk Assessment** is the process of analyzing and integrating professional judgments about probable adverse conditions and events in order to develop the audit work-schedule. The CAE should generally assign higher audit priorities to high-risk activities.[6]

  Risk assessment can be summarized in this manner:

  > Every entity faces a variety of risks from external and internal sources. Risk is defined as the possibility that an event will occur and adversely affect the achievement of objectives. Risk assessment involves a dynamic and iterative process for identifying and assessing risks to the achievement of objectives. Risks to the achievement of these objectives from across the entity are considered relative to established risk tolerances. Thus, risk assessment forms the basis for determining how risks will be managed.
  >
  > A precondition to risk assessment is the establishment of objectives, linked at different levels of the entity. Management specifies objectives within categories relating to operations, reporting, and compliance with sufficient clarity to be able to identify and analyze risks to those objectives. Management also considers the suitability of the objectives for the entity. Risk assessment also requires management to consider the impact of possible changes in the external environment and within its own business model that may render internal control ineffective.[7]

[5] IIA's *Standards* Glossary, pg. 21.
[6] SIAS *No. 9 – Risk Assessment* 520.04.10.
[7] COSO, *Internal Control—Integrated Framework*, Executive Summary, May 2013, pg. 4.

Benefits of Risk Management

Through **proper risk management**, an organization can reduce the probability of negative events occurring; in addition, with appropriate risk management it can reduce any impacts should a negative event occur. The benefits from a risk management process depend, to some extent, on the industry the organization operates in; however, the following benefits of prudent risk management can apply generally to all companies:

- Increased shareholder value through minimized losses and maximized opportunities
- Fewer disruptions, shocks, and unwelcomed surprises to business operations
- Employees, stakeholders, and governing and regulatory bodies have increased confidence in the organization
- More effective strategic planning
- Better cost control
- Quick assessment and grasp of new opportunities
- More complete contingency planning
- Improved ability to meet objectives and achieve opportunities

Risk Appetite

Risk appetite reflects the level of risk a company can optimally handle, given its capabilities and the expectation of its various stakeholders, such as vendors and creditors. Various organizations have their own specific definitions of risk appetite, shown in the following chart:

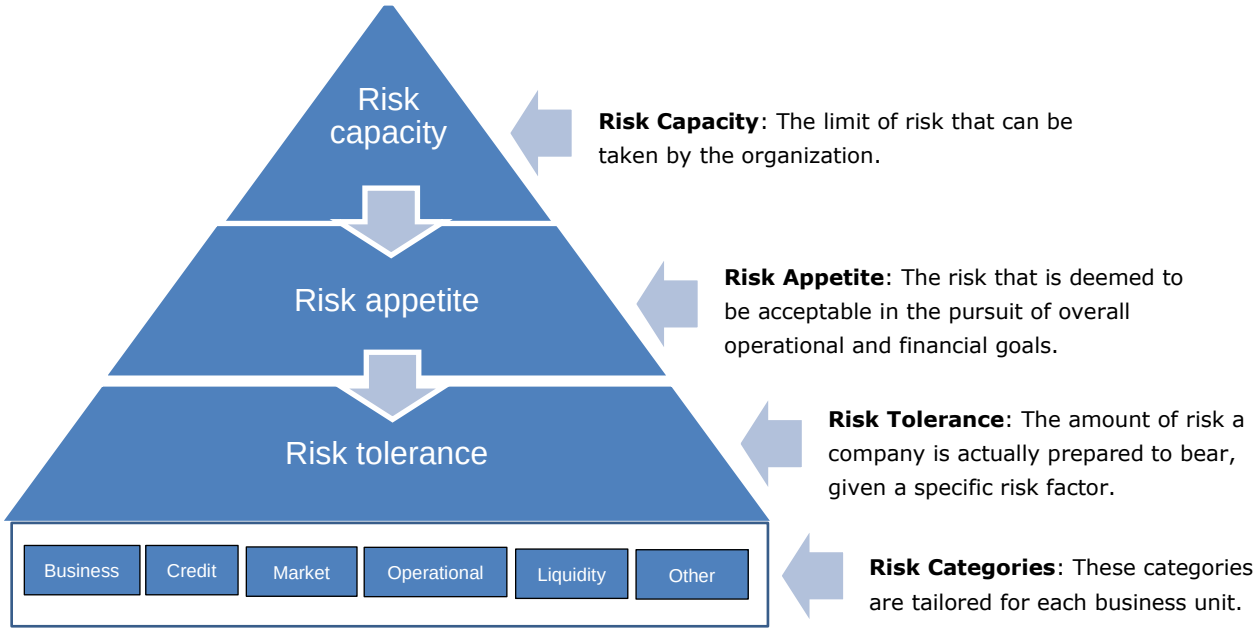
Organization	Definition
COSO's ERM framework	"The amount of risk an entity is willing to accept in pursuit of value."
The Institute of Internal Auditors (January 2009)	"The level of risk that an organization is willing to accept."
ISO 31000:2009/ISO Guide 73:2009	"Amount of risk that an organization is will to pursue or retain or take." (ISO 31000: 2009 does not use the word "risk appetite" but instead focuses on "**risk attitude**'" and "**risk criteria**.")
Society of Actuaries ERM Symposium (April 2010)	"The level of risk that company management deems to be acceptable in pursuit of overall financial and solvency goals."
HM Treasury's Orange Book	"The amount of risk which is judged to be tolerable and justifiable."

Management must consider and balance the many different **views** and **risk factors**, with the final decisions being made at the corporate level (that is, using a **top-down approach**). In a sense, a company's risk appetite can reveal a great deal about its corporate culture. Balancing risk appetite and control is not easy, but it is a process that companies need to perfect if they are to succeed. For example, if a financial institution is actively involved with complex financial instruments such as forward contracts, futures, options, or swaps, all relevant stakeholders need to know whether or not the company's directors understand the function of these instruments and the reasons for which the company is involved with them. Understanding a company's risk appetite is useful for ascertaining the **goal congruence** between the wishes of the board and the actions of management.

Risk Appetite, Capacity, and Tolerance

Two additional terms are useful for understanding risk appetite: **risk capacity** and **risk tolerance**. The figure below illustrates and defines the interrelatedness of risk capacity and risk tolerance.

Risk Capacity, Appetite, and Tolerance

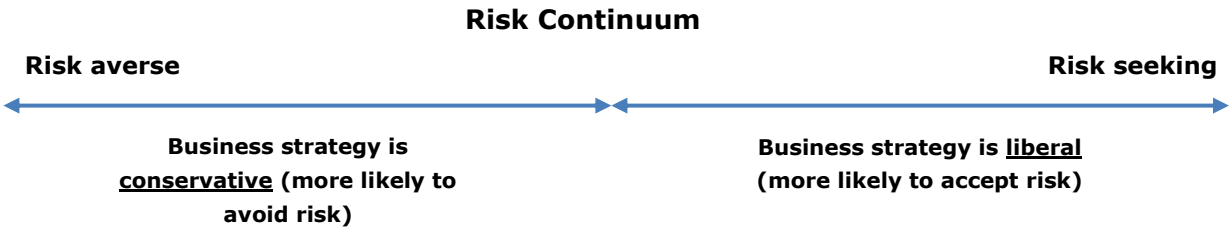


As this diagram indicates, a company must first determine its **risk capacity** in order to decide its **risk appetite**. Risk capacity is the absolute limit a company is willing to lose without bankrupting itself. Once a company gauges its risk capacity, it can ascertain how much it is willing and able to lose—that is, its risk appetite. Therefore, **risk appetite must be set within the limits of risk capacity.** Once risk capacity and appetite are established, **risk tolerance** represents the actual level of risk a company is able to bear, which can be determined through a combination of certain specific risk factors, shown as **risk categories** in the diagram. For example, if a company extends credit to its customers, then the company exposes itself to **credit risk** (that is, the risk that the customer will default). Given such possibilities, the company has to be completely clear about the amount of debt it can tolerate.

Different Attitudes Towards Risk

Businesses must assume risks in order to grow and survive. A **risk-averse** business is not necessarily trying to avoid risk; rather, it is seeking to obtain a reasonable, safe return for the comparatively low risk it is willing to undertake. On the other hand, **risk-seeking** businesses focus on maximizing their returns, and thus they may be less concerned about the level of risk that they assume.

The range of attitudes that businesses have towards risk can be shown in the **Risk Continuum** diagram (shown below). The left-hand side indicates businesses that are averse to taking on risk and whose strategies are therefore designed to avoid risk. On the right-hand side are businesses that actively seek out and accept risks. The ends of the diagram represent two extreme conditions, and most companies situate their place on the continuum somewhere in between these polar opposites.



No matter where a business situates itself on this continuum, it should be concerned about reducing risk without completely eliminating it. The function of risk appetite in this regard is to show the business where it is on this continuum: either risk averse or risk seeking. It is important to consider risk appetite when business strategies are being formulated and developed[8]; in fact, **business strategy** and **risk appetite** are so intertwined that both must be considered together.

Example: To illustrate the factors relevant to adopting a high-risk-seeking strategy, consider the example of a defense contractor dealing in computer software protection. This contractor decides to direct all corporate resources to a single product: a new software program to protect highly classified defense information from viruses and hackers. Through appropriate due diligence, it is determined that a successful bid will result in an extremely profitable windfall for the company. However, the tremendous investment of time and resources means that failure to secure the government contract will unavoidably result in bankruptcy. Clearly, this strategy represents a high level of risk appetite. Therefore, before moving forward on this decision, the board must consider all pertinent angles and sign off on the plan, thus indicating their acknowledgement and acceptance of the risk-seeking strategy. It is also possible that investors may approve this approach by increasing the value of the company's stock; conversely, they may punish the company by selling off shares. Either way, the direction of investor activity greatly depends on their own assessment of the company's position on the risk continuum.

[8] COSO, *Enterprise Risk Management—Integrated Framework*, Understanding and Communicating Risk Appetite, pg. 4.

Influences on a Company's Risk Appetite

The following is a list of the many factors that can influence a company's risk appetite:

- **The company's position in the business-development life cycle**. A company in the **start-up** phase will often require a high risk-appetite; indeed, 50% of US companies fail within their first five years. If a company survives the start-up phase and moves into the **growth stage**, it will need tighter controls to manage risk. Companies in this stage might establish an internal control function to oversee control and risk processes. Once companies enter the **maturity stage**, sales generally level off, which means that the focus switches to controlling cost, which can be done by taking advantage of increased productivity gains (perhaps through expanding overseas or developing other products).
- **The viewpoints of the major stakeholders**, including the company's major shareholders, bond-holders, lenders, analysts, and many others. Each one of these stakeholders might have a different opinion as to how much risk the company should be willing to take on. For example, shareholders looking for higher returns might press a company to take greater risks; however, the bank that lent the company money might prefer limits on risk-taking.

  Example: Whether or not a particular viewpoint is taken into account will depend on how much influence or power a given stakeholder has. For example, if a bank lends a company a substantial amount of money, then the bank will have a strong interest in the company's continued existence. If the bank feels that the company is taking unnecessary risks, then it could be in a position to voice its concerns to management and to the board. The level of concern the bank expresses would be directly proportional to the amount it has invested (that is, more investment, more level of concern). In addition, the likelihood that the bank's concerns will influence company policy also rises in proportion to its level of investment (that is, more investment means more influence).

- **Accounting factors**, such as the volume of transactions, the complexity of the accounting system, changing rules and regulations, and so forth.
- The **opportunity for fraud** to be committed.
- **External factors**, such as changing economic considerations, changes in the industry, changes in technology, and so forth. For example, if an economy in which a company operates is going through a recession, the company may decide that a larger bad-debt provision would be appropriate to take into account the possibility of more consumer bad debt. If an industry comes under more scrutiny because of environmental issues, the company might also decide that it needs a provision for environmental contamination.
- **Governmental restrictions**. Depending on the industry, governments can dictate the level of risk a company is able to take on. Industries such as insurance and banking are generally more regulated and more restricted than other companies because they are responsible for the public's money.
- **Entity-level factors**, such as the quantity and quality of hired personnel, quantity and quality of training courses, disruptions in the information system processing system, changes in the organization's structure, and changes in key personnel.

Risk-taking and Cultural Considerations

Companies that operate across national and cultural borders will encounter a range of practices and expectations. In setting business strategies, a company might choose to adopt what appears to be the path of least resistance, which is to export the corporate and management philosophies of the "home" country to the cross-border or overseas divisions. However, cultural insensitivity may cause unintentional but serious harm to relationships with employees and customers and damage a company's potential for success.

Risk-taking, particularly in the business environment, is a subject that is closely connected to cultural practices and beliefs, and therefore management should carefully study and understand regional attitudes

about risk-taking before implementing a particular set of objectives and the methods for achieving them. By gaining an understanding of risk-taking attitudes in the overseas culture, a company has much to gain. Foremost, a company can cultivate strong ties with employees and business associates. Second, potential pitfalls (such as unintentional offense or misunderstandings) can be avoided. Third, a culture-sensitive company can derive an advantage over their less-aware competitors by demonstrating a willingness to take the local culture into account.

That said, it is not necessary for a company to remove all ties to the "home" culture, since doing so might very well jeopardize the identity that makes a company distinct among its competitors—and risk-taking strategies are certainly an important component of a company's identity. Striking the right balance between the organization's "home" culture and other nations' culture is a delicate but rewarding process. Toward this goal, **cross-cultural training** (such as through consultants or retreats) is an effective means of creating inter-cultural dialogue, communicating company goals, and addressing and bridging cultural differences.

Formalizing Risk Appetite

If a company has not made a **formal statement** about its risk appetite, then it has a potential control problem. Without such a statement, managers could be running the company with insufficient guidance on the levels of risk that they are permitted to take, or they may not be seizing important opportunities due to a perception that taking on additional risk is discouraged.

Formalizing risk appetite means putting it in writing so that there is little confusion about the board and management's attitude toward risk. Indeed, formalizing risk appetite improves communication between all those who oversee risk management. Generally speaking, the larger and more complex an organization is, the more formalized its policies and procedures should be regarding risk appetite. For example, large financial services companies can be expected to have highly detailed risk-appetite statements, whereas a small or mid-sized company might have a risk-appetite statement no more than a sentence or two.

Example: A short risk-appetite statement may be "no project investment should be greater than 20% of company's net assets" or "IFRS earnings should not be negatively affected by more than 50% of its forecasted earnings."

Risk appetite can be expressed either **quantitatively (numerically)** or **qualitatively**. The following are examples of quantitatively expressing risk appetite:

- **Solvency**. A company does not want to lose more than a defined amount of its capital so that it can remain a going concern following an extreme-loss event or combination of extreme-loss events.
- **Capital coverage**. A company requires that its capital is sufficient to cover a multiple of the amount of capital needed to absorb a loss of a certain magnitude (for example, a 1-in-100-year event).
- **Earnings**. A company does not want to lose more than a defined percent or multiple of annual net income.
- **Company value**. A company wants to assume the amount and kinds of risks that maximizes company value (that is, the risk-adjusted present value of future cash flows).

There may be aspects of risk that cannot be measured quantitatively, but regardless of the measurement limitations, risk still has to be identified. In such cases, "risk preferences" can be used to determine and establish risk appetite. **Risk preferences** define certain risks that the company does not want to accept, such as avoiding investment in subprime mortgages or taking out variable-annuity loans.

Once a company understands its risk appetite, it can start developing its risk management process.

Types of Risk

The following is a list of four common categories of risks:

1) **Strategic risks** occur on a global or macro level, such as unexpected fluctuations in the global economy or related market conditions, political risk, and risks that are connected to the company itself, such as reputation risk, brand risk (patent and trademark protection), leadership risk, or the risk of customers' needs changing. Strategic risks can be related to actions of competitors and changes in the regulations businesses are subject to, as regulatory changes could cause significant increases in compliance expense. Capital availability is another strategic risk.

   The company will need to identify strategic risks, be aware of them, and monitor them. However, it is unlikely that the company can actively influence the global economy or the political environment in which it operates.

2) **Operational risks** result from inadequate or failed internal processes, people, or systems. Examples of operational risks include technology, business continuity, customer satisfaction, and the risk of product or service failure. Because operational risks are more directly under the influence of management, the company is in a better position to mitigate these issues through its own actions.

   Operational risk also includes legal and compliance risks. **Legal risks** are associated with uncertainty due to litigation or uncertainty in the applicability or interpretation of contracts, laws, or regulations. **Compliance risk** refers to the danger that current or future profits or assets may be negatively impacted as a result of violations of or nonconformance with laws, rules, regulations, required practices, internal policies and procedures, or ethical standards.

3) **Financial risks** are connected to the financial health of the company. Examples include volatility of foreign currencies, volatility of interest rates, volatility of commodity prices (inputs), credit risk, liquidity risk, and market risk.

   When a company borrows money from a lending institution, it engages in two forms of financial risk:

   a. **The risk that the company will not be able to pay its interest and other obligations.** As the firm increases the proportion of debt financing to total financing in its capital structure, its fixed cash outflows for interest expense will increase. As a firm's cash outflows for interest expense increase, the possibility of the firm's becoming insolvent increases.

   b. **The presence of debt and interest payments increases variability in earnings per share.** Borrowing affects the fixed interest costs on the firm's net income, and fixed interest costs increase the volatility of a firm's Earnings Before Taxes (EBT).

4) **Hazard risk** refers to harmful or catastrophic events that can be insured against. Examples of hazard risks and their relevant remedies (in parentheses) include natural disasters (property insurance), death of a key employee (key-person life insurance), and personal injury that takes place on the premises of the business (liability insurance).

Volatility affects the consistency of expected results and increases risk because it introduces uncertainty about the future. Greater volatility means that there is a higher probability that future results will be poor.

The **time period** under consideration is also a crucial factor in risk. Risk increases in proportion to length of time because with more time there are more chances for something to go wrong.

> **Note:** Volatility and time period are not completely negative factors. There is always a chance that volatility and a lengthy time period might yield better than usual results. However, this section on risk concentrates primarily on the negative aspects.

Political risk, a form of strategic risk, is the likelihood that a political event will cause an investment's value to change or become worthless. Political risks include government **expropriation** (seizure of private property with minimal or no compensation), **war**, **blockage of fund transfers**, **inconvertible currency** (that is, a government prevents its currency from being exchanged for other currencies); **bureaucracy**, **regulations**, **taxes**, **corruption**, and even **consumer bias** (preferring local rather than foreign products).

Internal and External Risk

Risks can be classified as internal or external.

Examples of internal risks:

- **Infrastructure events**, such as organizational or policy changes, which can cause a rise in customer complaints and a decrease in customer satisfaction. Expansion of facilities carries a risk that the increased production will not be accepted in the marketplace.
- **Process-related events**, such as changes in the way an item is produced. Changes in processes can cause a range of risk events, like processing errors and omissions.
- **Internal technological events**, such as new software that may not work properly, improper setup, and inadequate user training.

Examples of external risks:

- **Competition** and actions of competitors.
- **Regulations** and compliance problems.
- **Supply chain disruptions**.
- **Political risk**.

Question 1: The lawyers of Regional Tobacco Company have recently informed management that they believe that the company may lose an ongoing court case and as a result will be forced to pay a large monetary damage. The characteristics of the court and judicial system that influence the frequency and severity of losses is known as

a) Moral hazard.

b) Compliance risk.

c) Speculative risk.

d) Legal risk.

(HOCK)

Question 2: Mike Smith is the CFO at TechEquip Inc., a manufacturer of computer equipment. Smith learned last week that the accounting department has not completed any bank reconciliations for the last six months due to the implementation of a new accounting software package. What type of risk has Smith identified?

a) Financial risk

b) Hazard risk

c) Operational risk

d) Strategic risk

(CMA Adapted)

Question 3: Riverfront Properties' new apartment building was almost complete. There were a few inspections left to pass, and they did not have a certificate of occupancy. However, the owner felt that they were close enough that he allowed new tenants to begin moving in. The risk that the owner has created in this situation is best described as

a) Operational risk, because the owner was not in compliance with laws and regulations.

b) Strategic risk, because the owner was not in compliance with laws and regulations.

c) Strategic risk, because the remaining inspections could determine that the building is uninhabitable.

d) Operational risk, because the remaining inspections could determine that the building is uninhabitable.

(CMA Adapted)

The Risk Management Process

Below is a general approach to the risk management process. With respect to applying these guidelines to a company, department, or specific situation, steps may be added or altered to take into account the specific situation and the state of the company's existing risk management process.

The steps are:

1) Risk identification
2) Risk assessment
3) Risk prioritization
4) Response planning
5) Risk monitoring

Step 1: Risk Identification

To begin, management must identify risks that have some probability of occurring and impacting operations. Risk identification needs to be balanced with the company's strategic goals. At the same time, management must take into consideration the threats and opportunities the business faces along with the strengths and weaknesses within the business itself.

Outside the rare exception of a catastrophic event, it is unusual for a single event or risk factor to affect the entire company at once. Even so, the risk-identification process should be conducted at all levels of the organization, since certain risk events may affect only one or a few segments of the company. An effective risk-identification strategy finds key people within each unit (such as operations, finance and accounting, IT, and management) to take part in the identification and assessment of risks in their areas of responsibility.

Step 2: Risk Assessment

Next, identified risks are quantified and evaluated for their **likelihood of occurring** and **relative significance**. The amount of potential financial loss is estimated along with other nonfinancial considerations.

Exposure to risk is assessed according to the **loss frequency or probability** and the **loss severity**.

1) **Loss frequency** or **probability** measures how often the loss occurs on average, and it is expressed in relation to a time period. A loss frequency of "0.25 per year" means that the probability is 25% that a loss will take place in any given year, and therefore on average a loss occurs once every four years.

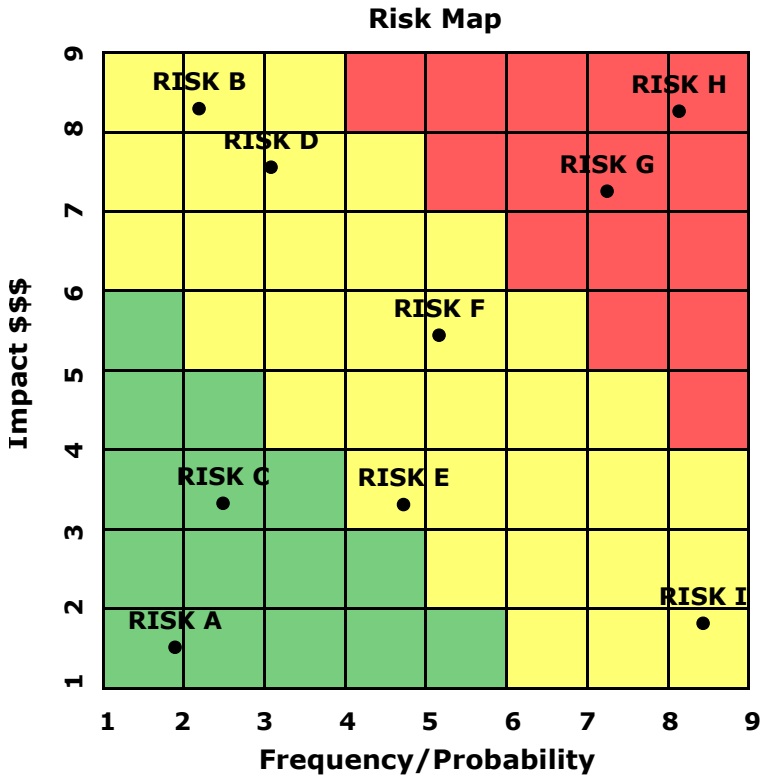
2) **Loss severity** measures the financial impact of a loss. For example, a company may determine that historically, when a particular loss has occurred, the average cost of the loss to the company has been $50,000.

Qualitative Risk Assessment Tools

To make the risk assessment process efficient, identified risks need to be prioritized so that management knows which issues require the most immediate attention. Although financial risks are key considerations, the company should also consider qualitative factors such as the potential for lost customer goodwill. Therefore, to a large extent **risk ranking** is a qualitative assessment.

Qualitative assessment can be visualized by means of a **risk map** or **risk heat map**. For each identified risk, the **probability of the event happening** is plotted on the x-axis on a scale of 1 to 9; in addition, the **estimated impact of the loss** is plotted on the y-axis, also on a scale of 1 to 9. A risk map helps identify risks that are both more likely to occur and that have a greater potential for loss. If a particular risk involves quantitative factors such as financial loss, the potential quantitative loss is included in the assessment. Qualitative risk assessment can also be done without calculating the amount of loss as a specific amount. It can rank the amount at risk from the highest to the lowest for different risk events.

The following chart shows a combination of assessed risks, mapped according to probable frequency (red is the most frequent, green the least frequent) and the amount of financial impact (in US dollars):



In this map, Risks A and C have low financial impact and low probability; therefore, they should be assigned low priority. Conversely, Risks G and H have high financial impact and high probability; therefore, they should be placed high on the priority list.

This kind of qualitative risk assessment can identify serious risks that may not have an immediate or obvious financial impact but which still could prove damaging to the company. Consider Risk I. Its financial impact is not as great as Risks B and D and therefore it might rank low on the priority list. However, Risk I has a very high probability rating, meaning that it is much more likely to happen than Risks B and D. As a result, management should seriously consider moving Risk I up the priority chain.

Quantitative Risk Assessment Tools

The following is a list of quantitative assessment tools:

- **Value at Risk (VaR)** measures the potential loss in value of a risky asset or event over a defined period for a given confidence interval. VaR is based on the assumption that the possible outcome of the event is represented by a normal distribution. With a normal distribution, 95% of the results will lie within 1.96 standard deviations of the mean and 99% of the results will lie within 2.57 standard deviations of the mean. This information can help predict the range of results with a measured level of confidence.

  Example: If the VaR on an asset is $100 million at a one-week, 95% confidence level, there is only a 5% chance that its value will drop more than $100 million over any given week.

- **Cash Flow at Risk** measures the likelihood that cash flows will drop by more than a certain amount. Cash Flow at Risk also uses the measures of a normal distribution.
- **Earnings at Risk** measures the confidence interval for a fall in earnings during a specific period.
- **Earnings Distributions** is a graphical representation of the probability of a level of return and the level of return itself.
- **Earnings per Share Distributions** is a graphical representation of the probability of the amount of earnings per share (EPS) and the likelihood of each level occurring.
- **Benchmarking** compares the organization's risk profile and the impact of the risks it faces against similar companies.

In addition, other quantitative techniques can be used to assess risks. Breakeven analysis, sensitivity analysis, decision trees, simulation analysis, and scenario analysis can help to determine which risks have the most potential impact on a project.

Question 4: The term for the quantitative measure of the accuracy of the potential financial loss is

a) Residual risk.

b) Inherent risk.

c) Risk ranking.

d) Value at risk.

(HOCK)

Step 3: Risk Prioritization (Ranking)

After risks have been identified and assessed, the company must decide which ones should receive the highest priority. This decision includes quantitative and qualitative analysis.

The following four terms measure the potential loss associated with identified risks:

1) Expected Loss (given a set of probabilities)
2) Unexpected Loss
3) Maximum Probable Loss
4) Maximum Possible Loss (also called Extreme or Catastrophic Loss)

1) Expected Loss

An **expected loss** is the amount that management expects to lose to a given risk per year **on average** over a period of several years. **Because the loss is expected, it should be included in the budget**. Expected loss can be calculated in different ways depending on the specific situation that is being assessed.

First, for a specific event that has multiple probable outcomes, expected loss can be calculated as the weighted average of all the possible losses, using the probabilities of each of those losses coming to pass as the weights. Over the long term, the expected loss is the **average** amount of loss the company expects to incur during any given period.

Example: Assume that a company has determined that an event has the following probabilities of loss from a particular risk during a one-year period:

Probability	Amount of Loss
10%	$100,000
20%	$120,000
30%	$160,000
35%	$180,000
5%	$500,000

The probabilities must add up to 100%. The expected loss is calculated by multiplying each possible result by the probability (percentage chance) it has of occurring and adding these results together, as follows:

10%	×	$100,000	=	$10,000
20%	×	$120,000	=	$24,000
30%	×	$160,000	=	$48,000
35%	×	$180,000	=	$63,000
5%	×	$500,000	=	$25,000
				$170,000

Even though $170,000 is not one of the possible outcomes, it is the expected loss, a weighted average of all the possible losses given their probabilities.

Obviously, this process is greatly influenced by the possible outcomes and probability that is assigned to each outcome. For example, if the $500,000 loss had been given a higher than 5% chance of occurring, the expected loss would have been higher.

Second, expected loss can also be calculated for events that may or may not happen. For example, it is possible that there is a 40% chance an event will occur and a 60% chance that it will not occur. When loss is quantified in this way, there is only one probability for each risk: its probability of occurring.

The expected loss from each event is calculated by multiplying the dollar amount of each potential loss by the probability the event will occur. The amount of loss that results for each risk balances the amount of the loss

with the probability of loss. The resulting loss amounts enable companies to better identify which risks are most important.

Example: A company has identified four risks. Below is the probability of occurrence for each risk during a one-year period and the amount of each loss if the risk does occur.

	Probability	Amount of Loss
Risk A	10%	$1,000,000
Risk B	25%	$600,000
Risk C	40%	$400,000
Risk D	90%	$200,000

Notice that these probabilities **do not sum to 100%**. They should not sum to 100% because each one represents the probability that a different event will occur. Each risk probability is independent of all the others.

A $100,000 expected loss for Risk A does **not** mean the annual loss from Risk A will be $100,000. It means that in 9 out of 10 years Risk A will not occur. In 1 out of 10 years, however, Risk A will occur and the loss will be $1,000,000. By extension, when that one-time $1,000,000 loss is averaged over a period of 10 years, the average expected loss **per year** is $100,000 ($1,000,000 ÷ 10).

Using the shortcut method, the expected value of each loss is calculated by multiplying the amount of the loss by the probability of its occurrence, as follows:

Risk A	10%	×	$1,000,000	=	$100,000
Risk B	25%	×	$600,000	=	$150,000
Risk C	40%	×	$400,000	=	$160,000
Risk D	90%	×	$200,000	=	$180,000

The expected value of each loss can be used to determine the most critical potential loss event. In this example, the risk item that has the lowest dollar amount of loss ($200,000) is probably the most critical to the company because of the high likelihood that it will occur. Its high probability of occurring causes its expected loss ($180,000) to be the highest of the four identified risks.

The following risks are ranked according to their expected values:

#1	Risk D	90%	×	$200,000	=	$180,000
#2	Risk C	40%	×	$400,000	=	$160,000
#3	Risk B	25%	×	$600,000	=	$150,000
#4	Risk A	10%	×	$1,000,000	=	$100,000

2) Unexpected Loss

An unexpected loss is the amount that **could likely** be lost to a risk in a very bad year, **in excess of the amount budgeted for the expected loss**, up to the maximum probable loss. The business should reserve the unexpected loss amount as capital.

3) Maximum Probable Loss

The maximum probable loss, also called the probable maximum loss (PML), is **the largest loss that can occur under foreseeable circumstances**. The maximum probable loss is the largest amount of damage that **could likely** occur in a very bad year. Damage greater than the maximum probable loss **could** occur, but such an outcome is very unlikely.

If the risk is to real property, the estimated maximum probable loss would take into consideration the property's characteristics. The maximum probable loss to real property is inversely related to the size of the building and to the effectiveness of protection in place. For example, the larger the building is, the less probability there is that the entire structure would be destroyed. The better the fire suppression is, the more likely it is that a fire would be brought under control and extinguished completely before the whole building

burned down. The building's state of occupancy also influences the amount of damage that could occur. A vacant building is more vulnerable to vandalism or destruction than an occupied building since occupants are in a position to intervene during a crisis.

4) Maximum Possible or Catastrophic Loss

Maximum possible or catastrophic loss is the worst-case scenario, the greatest possible loss from a specific risk or event. For example, if the risk is the loss of property, then the maximum possible loss is the total destruction of the property. If the property is a structure, the maximum possible loss is the entire structure and all of its contents.

Step 4: Response Planning

Once risks have been identified, assessed, and ranked, management needs to determine the appropriate responses. In doing so, management will consider the risk of loss, the amount of loss, and the costs and benefits of the various risk responses. A company can choose among five responses for each specific risk:

1) **Avoid**. The company choses to eliminate the risky event or item. They might sell or otherwise dispose of a business unit or product line, or they might leave a specific geographic area. Efficiently deploying "avoid the risk" requires a great deal of foresight and fortitude, since the activity under consideration may be extremely profitable. As a result, the problem with "avoid" is that it is usually considered only after a damaging risk event has already occurred.

2) **Reduce (mitigate)**. Management recognizes that the risk will continue to exist but they look for ways to decrease its potential impact. They might expand an existing product line, split a function into two geographically separate areas, or diversify.

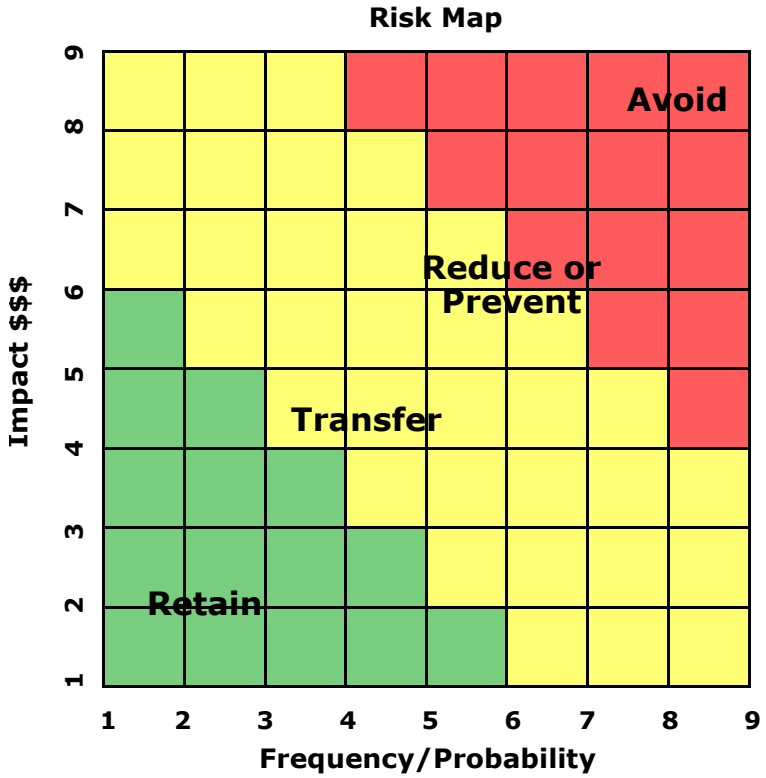
3) **Transfer (share)**. Management transfers the risk of loss either partially or wholly to another organization. The primary example of transferred risk is insurance. Risk can also be transferred through a contract or by using derivatives as hedges.

> **Note: Risk transfer is not risk prevention.** In other words, a company is not trying to prevent an unwanted event from occurring by purchasing insurance. Rather, it is **transferring the risk** of loss to another organization should that event occur. For example, if a company buys hurricane insurance, it is not preventing a hurricane. Instead, it is transferring the risk of hurricane-related loss from themselves to the insurance company.

4) **Retain**. Under certain circumstances, the company may wish to accept some or all of the impact of a risk. For example, a retained risk is the portion of a risk not covered by insurance, such as a deductible. A company can adjust the amount of retained risk by increasing or decreasing the deductible. A retained risk may also be a risk that the firm chooses to self-insure against; that is, the company elects to budget and pay for the risk out of its own funds if the adverse event happens.

5) **Exploit (accept)**. Exploiting a risk is the strategic process by which a firm deliberately exposes itself to risk because management believes they can generate value for shareholders. For example, a company might invest in an emerging geographic market that carries substantial political and economic volatility or introduce a new product when its success is uncertain.

A risk map can help determine the appropriate response to each risk. The chart below includes the suggested risk response for each combination of impact and probability, depending upon where each risk is mapped.



After the risk-management process has been completed, some **residual risk** may remain. Any residual risk should be reported to the appropriate level (for example, the board of directors) so that the company can decide either to accept the residual risk or reduce it further.

Question 5: Buckeye Conferencing leases meeting rooms to outside parties to use. The lease specifies that the outside party, not Buckeye Conferencing, will be liable for any damages resulting from the use of the meeting room, and that Buckeye Conferencing would be "held harmless" for these damages caused by the outside party. Buckeye Conferencing's actions demonstrate

a) Risk retention.

b) Self-insurance.

c) Insurance risk transfer.

d) Noninsurance risk transfer.

(HOCK)

Question 6: When the likelihood of loss is high and the amount at risk is high, the most appropriate risk response would probably be:

a) Avoiding the risk in whatever manner is available.

b) Reducing the risk by trying to minimize the loss that might occur.

c) Transferring the risk to another party through hedging or similar action.

d) Accepting the risk as the cost of reducing the risk will outweigh the potential benefits.

(HOCK)

Step 5: Risk Monitoring

After risk-management strategies have been implemented, the company must ensure that each risk has been addressed. Additionally, an ongoing review and assessment of the risk management process is needed because what may have worked in the past may no longer be relevant in the present.

Furthermore, external conditions can change. New risks may appear or an identified risk may become an even greater threat. For example, unexpected political events may arise, which may create new risks and increase its concern about a certain geographical area.

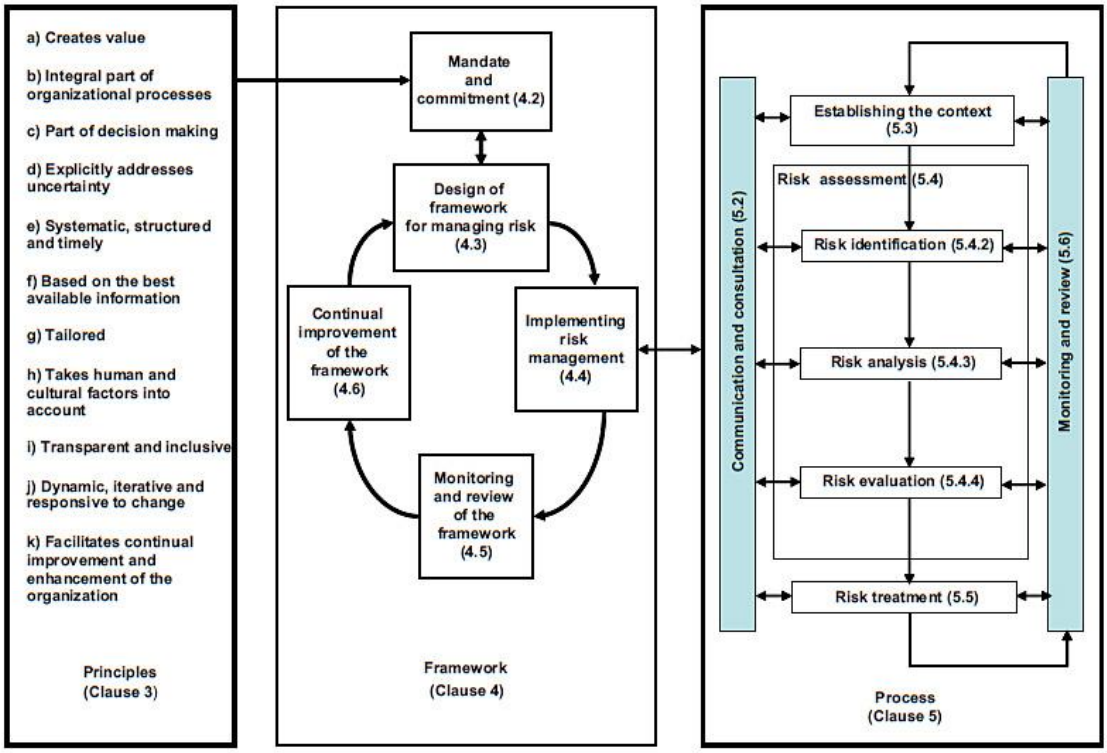
A senior manager responsible for the risk area might conduct follow-up risk management. These managers should be surveyed regularly or should report regularly with a current assessment on the likelihood of an identified risk occurring. In addition, internal auditors can ask about the status of identified risk areas as they perform their internal audits.

Note: A company's **risk appetite**, the amount of risk it is willing to accept in pursuit of value, will greatly influence its risk management process. A company's attitude toward risk may come from its shareholders, its contractual requirements, regulatory requirements, or the philosophy of its management.

Each organization pursues various objectives to add value and should broadly understand the risk it is willing to undertake. Companies that are less tolerant of risk will identify more specific risks than a company that has a greater risk tolerance.

ISO 31000 Principles, Framework and Process

Below is the diagram of the Principles, Framework, and Process of ISO 31000. The numerical references refer to the specific section of ISO 31000.



ISO 31000 Principles of Risk Management (Clause 3 in the diagram)

ISO 31000:2009 identifies the following 11 principles that an organization should comply with at all levels in order for risk management to be effective:

1) **Risk management creates and protects value.** Risk management helps the company achieve its objectives and therefore it creates value. It also protects the current value of the business from loss.
2) **It is an integral part of all organizational processes.** Risk management does not operate in isolation. It needs to be part of all planning and all processes.
3) **It is part of decision making.** Risk management helps managers make informed decisions by providing information about alternative courses of action.
4) **It explicitly addresses uncertainty.**
5) **It is systematic, structured, and timely.**
6) **It is based on the best available information.** There are many situations in which more or better information is desirable. However, the lack of perfect information cannot prevent decisions from being made. Risk management uses the best available information.
7) **It is tailored.** What works for one company may not work for another. Risk management decisions must fit the specific needs of the given organization.
8) **It takes human and cultural factors into account.** Risk management must take into account the skills, knowledge, attitudes, and perceptions of individuals both within and outside the organization that will impact the risk management process.
9) **It is transparent and inclusive.** Risk management involves all relevant stakeholders and decision-makers in a timely manner.
10) **It is dynamic, iterative, and responsive to change.** Risk management needs to continuously change as internal and external environments change. What may have been effective in the past may no longer be effective in the present.
11) **It facilitates continual improvement of the organization.** Risk management should strive for continuous maturity and improvement.

The ISO 31000 Framework (Clause 4 in the diagram)

The ISO 31000 Framework for risk management contains five steps:

1) Mandate and commitment
2) Design of framework for managing risk
3) Implementing risk management
4) Monitoring and review of the framework
5) Continual improvement of the framework

Exam Note: In the exam, if a question is specifically about ISO 31000, answer with the terminology specific to ISO 31000. If a question does not specifically mention ISO 31000 but includes ISO 31000 terminology, use the ISO 31000 terminology to answer the question.

1) Mandate and Commitment

Management plays a critical role in the risk management process. It sets the tone and leads the process of adopting risk management through:

- Supporting the risk management policy.
- Making sure that the culture of the company and the risk management policy are in agreement.
- Setting risk-management performance indicators that align with the company's performance indicators.
- Assigning accountability and responsibility to the appropriate levels in the organization.
- Allocating sufficient resources to the risk management process.
- Communicating the benefits of the risk management process to all stakeholders.
- Ensuring that the risk management framework stays relevant and appropriate over time.

2) Design of Framework for Managing Risk

Before risk management can take place, the organization must understand the **internal and external environments** because they impact the design of the framework.

The evaluation of the **external environment** (also called **context**) should include (but is not limited to):

- Evaluating the social, cultural, political, legal, regulatory, financial, technological, economic, and competitive environment.
- Evaluating the relationships with external stakeholders, including their perceived values.
- Identifying external factors that may impact the achievement of the objectives.

The evaluation of the **internal environment** should include (but is not limited to):

- Evaluating the organization's culture, structure, and corporate governance.
- Analyzing objectives along with the policies and procedures in place to achieve them.
- Examining the company's capabilities, including capital, time, and human resources.
- Appraising the relationships with internal stakeholders, including the perceived values that each holds.

The organization also must **establish a risk management policy** that states its objectives for and commitment to risk management. This policy should include:

- The rationale for managing risk.
- The accountabilities and responsibilities for managing risk, which also means identifying who is responsible for the development, maintenance, and implementation of the risk framework.
- A mechanism to address conflicts of interest.
- A **commitment to making the needed resources available** to those who are accountable and responsible for risk management. These resources include people, information, management systems, and training programs.
- The manner in which risk management will be measured and reported.
- Internal and external communication and reporting mechanisms.

After the risk-management policy has been completed, there are two important actions that must be done:

- The policy **must be communicated** to all those that it affects.
- Risk management must be **embedded into all organizational processes**, from top to bottom.

3) Implementing Risk Management (Including Risk Assessment)

Note: This implementation is called the **Process** in ISO 31000 (Clause 5 in the diagram).

While all steps of risk management are critical, **implementing risk management is at the heart of the process**. The three main steps in implementing risk management are:

3A) Establishing the context

3B) Risk assessment

3C) Risk treatment

Accompanying these three steps are two supporting activities:

3D) Communication and consultation

3E) Monitoring and review

3A) Establishing the Context

When the organization establishes the context of risk management, it is determining its objectives and identifying the internal and external elements of the environment that need to be taken into account when managing risk. It also sets the scope and criteria for the remainder of the risk management process. The risk criteria should reflect the organization's values, objectives, and resources, which is the basis for the risk treatment decisions that need to be made later.

3B) Risk Assessment

The following list outlines the three stages of risk assessment:

1) **Risk identification.** All internal and external risks must be identified in order to address all threats that the organization faces.

2) **Risk analysis.**

3) **Risk evaluation.** The level of assessed risk is compared to the risk criteria, thereby giving guidance for appropriate treatment.

3C) Risk Treatment

Risk treatment is the process of selecting one or more responses to risk and then implementing them. Risk treatment also includes assessing residual risk to determine if it is acceptable. A final step is assessing the effectiveness over time of the selected risk treatment options.

ISO 31000 lists seven risk treatment options:

1) **Avoiding** the risk, either by not starting the risky activity or discontinuing it.

2) **Taking on or increasing** the risk to take advantage of an opportunity.

3) **Removing** the risk source.

4) **Changing the likelihoods** of the different possible outcomes.

5) **Changing the consequences** of the different outcomes.

6) **Sharing** the risk with other parties.

7) **Retaining** the risk, after making an informed decision.

In choosing the correct response or responses, management must carefully balance the costs and benefits of each option. Individual risk responses may cause other risks, which in turn should be identified and assessed. Additionally, the company needs to assess the residual risk. Further actions may still need to be taken if the residual risk is unacceptably high.

3D) Communication and Consultation

Communication and consultation with internal and external stakeholders should take place during all stages of the risk management process. Ongoing communication will ensure that stakeholders understand the basis on which decisions have been made and the reasons that specific actions are required.

3E) Monitoring and Review of Risk Management Process

Monitoring and review should be a part of the risk management process, including both scheduled and regular reviews as well as any additional reviews if the internal and external environments change. The results of the reviews should be recorded and then communicated as appropriate, both internally and externally.

4) Monitoring and Review of the Framework

To assess the effectiveness of the risk management process, the organization should measure risk performance against indicators. They should also measure the risk management process against the risk management plan. Any deviations from the plan should be investigated to identify any issues that need to be corrected. Additionally, the organization should periodically—probably on an annual basis—assess the risk management framework, policy, and plan to make sure they are still appropriate, given any changes in the external and internal environments.

5) Continual Improvement of the Framework

The results of the monitoring and reviews in Step 4 should produce guidance for improving the risk management framework, policy, and plan. As these improvements are implemented, the organization's risk management and internal culture should improve. Therefore, this process needs to be done at regular intervals because the business environment is dynamic.

Below is the diagram of the Principles, Framework, and Process of ISO 31000. The numerical references refer to the specific section of ISO 31000.

IIB. Organizational Use of Risk Frameworks – ERM

Note: The main source for information about ERM is *Enterprise Risk Management—Integrated Framework*. This document was published in 2004 by the Committee of Sponsoring Organizations (COSO)[9]. A number of other organizations also have comprehensive guidance about ERM systems.

As defined by COSO,

> Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding achievement of entity objectives.

What differentiates ERM from more traditional risk management methods is that ERM is a process for developing a more top-down view of the key risks facing the organization. In other words, ERM approaches risk management not only from the individual department perspective but also for the organization as a whole.

[9] The Committee of Sponsoring Organizations (COSO) is the Committee of Sponsoring Organizations of the National Commission on Fraudulent Financial Reporting (called by the popular name "Treadway Commission" after its original chairman, James C. Treadway, Jr.). The Treadway Commission was formed in 1985 by and was funded by the five main professional accounting associations in the U.S.: the American Accounting Association, American Institute of Certified Public Accountants, Financial Executives Institute, Institute of Management Accountants, and The Institute of Internal Auditors.

In the past, individual departments or divisions were often responsible for their own risk assessments and management. This situation led to redundancies and also gaps in risk awareness because an event that might have an impact on the entity as a whole could be overlooked because it was not identified as having an impact on any one individual department. The goal of ERM is to coordinate the whole organization's risk identification, assessment, and management.

The Role of Portfolio Management in an ERM Program

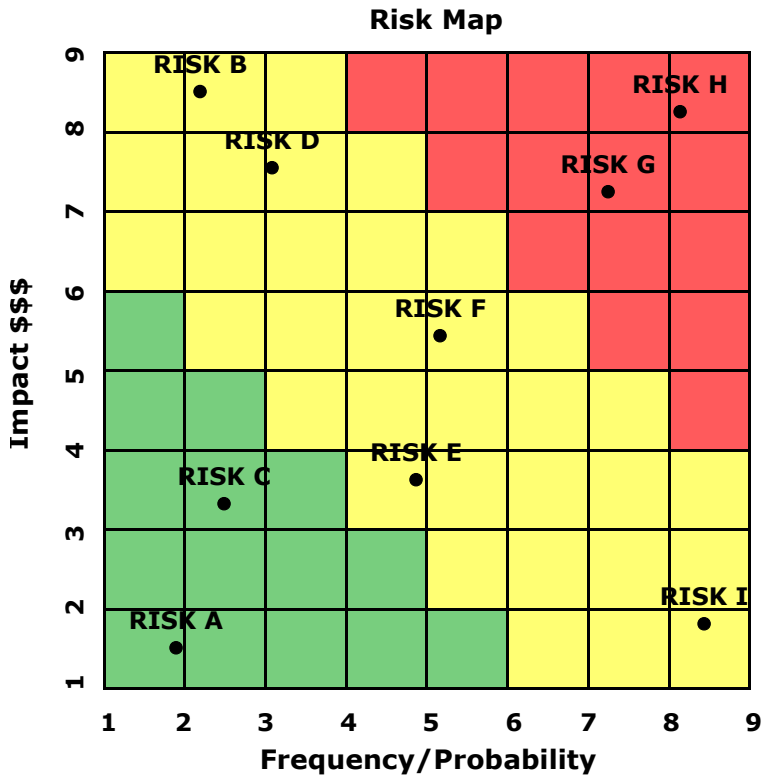
Enterprise risk management is rooted in modern **portfolio theory**, which is an investment philosophy that seeks an optimal portfolio of securities constructed according to carefully calibrated levels of risk and return. According to portfolio theory, a particular security should not be evaluated as a standalone investment; rather, **each individual security should be evaluated according to how its market value is expected to vary in relation to the market values of other securities in the portfolio**.

The key to constructing a portfolio is **diversification**, which is the process of combining securities to reduce risk. Different types of investments often change in market value in opposite directions, so when one asset's market price decreases, another asset's market price might increase and offset the loss.

Portfolio theory can be applied to risks. According to this perspective, considering risks individually (the **silo approach**) is dangerous because it fails to consider the interrelationships between risks. Instead, risks should be evaluated not as standalone events but as a **portfolio of events that influence each other**. The way that various individual risks interrelate with other risks is called a **portfolio view of risk**.

The underlying principle here is that risks collectively can have either a negative or a positive correlation to each other. From this perspective, negatively correlated risks can reduce overall risk. In fact, negatively correlated risks in combination could reduce entity risk—in other words, negatively correlated risks may not need to be eliminated. Conversely, risks that are positively correlated can multiply the damage. At worst, a seemingly insignificant risk can set off a chain reaction of positively correlated risks than can take down an entire company. Without the portfolio view of risk, it is possible that different divisions or departments of a company might regard a given risk differently—one might attempt to offset it while the other will ignore or even encourage it, and these conflicting agendas can lead to wasted time, resources, and opportunities.

Example: A falling currency value may make raw materials more expensive for a multinational organization; however, a devalued currency also causes the multinational's export business to increase, improving sales and profits. If the purchasing department hedges against the falling currency with currency options while the treasury function hedges against the same event with currency futures and neither one knows what the other is doing, the company will waste money and time since no currency hedging should even be done at all.



Portfolio theory suggests that preparing for high frequency/high impact events such as Risks G and H on the above risk map is important, but it is not sufficient. Management needs to also be aware of low frequency and high impact risks (Risks B and D above) that could devastate the organization if they occur. Furthermore, management needs to recognize that potential threats can precipitate a cascade of numerous interdependent events. Risk management resources need to be deployed to identify, assess, and mitigate not only the initial risk event but the cascading impact of the whole process. To prepare for multiple risk events, an organization can use scenario planning and statistical modeling.

- **Scenario planning** involves considering alternatives that enable an organization to respond quickly to future events, generally external, that are often unpredictable. Scenario planning is generally done by a group of senior executives and technical experts with a wide range of perspectives in order to consider possible scenarios other than the usual and the expected.
- **Statistical models** are formulations or analyses of data that can be used to make assumptions or verify assumptions about the data. Linear regression is an example of statistical modeling that is used commonly in developing a forecast from historical data.

Corporate Governance and ERM

Corporate governance is concerned with the achievement of overall objectives, and Enterprise Risk Management identifies objectives that are at risk. Therefore, **the organization's risk infrastructure needs to be developed from a governance and leadership perspective**. Risk management needs high-level oversight, and the board of directors must supply it to make sure that management has processes in place to identify, prioritize, manage and monitor its most critical risks. The board must also make sure that these processes are continuously reviewed and improved in response to changes in the business environment. The board's involvement in the corporation's risk management activities can also provide information for making better informed decisions.

Increasingly, boards of directors are establishing risk management committees responsible for overseeing and monitoring overall enterprise risk management activities. This oversight and monitoring includes receiving information regarding the corporation's policies, procedures, and practices regarding business, market, and

operational risk. Furthermore, many corporate boards have begun naming a Chief Risk Officer (CRO), whose activities are supervised by the risk management committee of the board of directors.

A risk management committee of the board of directors has not been required or defined by the SEC, so there are no formal requirements for members of a board risk committee. However, similar to the formal requirements for members of the board audit committee, members of the risk management committee should be nonemployee directors (not members of company management) and at least one of them should have risk-management qualifications.

ERM and Achievement of Objectives

ERM assists the organization achieve its objectives in four different categories:

1) **Strategic objectives:** High-level goals and objectives aligned closely with the organization's mission.
2) **Operations objectives:** Includes the effective and efficient use of company resources.
3) **Reporting objectives:** Includes **any** reporting the company does, financial or otherwise.
4) **Compliance objectives:** Aims to ensure that the company is in compliance with all relevant laws, rules, and regulations, no matter the source (internal or external).

Question 7: Enterprise Risk Management (ERM) is closely aligned with corporate governance because it

a) focuses management's attention on the risks mitigated.

b) identifies which of the organizations' objectives is at greatest risk.

c) reduces the level of acceptable risks to be taken.

d) identifies and isolates the silos in which risk exists.

(CMA Adapted)

Components of an ERM System

The following is a list of the main components of an ERM system, as defined by COSO:

1) **The internal environment.** This is the overall attitude regarding risk and risk management. The ERM internal environment is the basis for all the other ERM components, including:
    a. The **risk management philosophy**, or the set of shared attitudes and beliefs that characterize how the organization considers risk in everything it does and its culture.
    c. The **risk appetite**, or the amount of risk the organization is willing to accept.
    d. **The attitude of the board of directors** toward risk and their willingness to review management actions, ask hard questions, and serve as a check-and-balance control.
    e. The **integrity and ethical values** of the company that guide risk-based decisions.
    f. A **commitment to competence**, meaning the knowledge and skills necessary to perform assigned responsibilities.
    g. **Clear lines of authority and responsibility** and appropriate lines of reporting.
    h. **Delegation of authority and responsibility** that give first-line employees greater authorization and approval authority and encourage employee creativity, faster response times, and greater customer satisfaction.
    i. **Human resources practices** regarding employee hiring, training, compensating, promoting, disciplining, and other actions that inform all employees what is favored, what is tolerated, and what is forbidden.

2) **Objective setting.** Before an effective ERM environment can be established, the organization's strategic objectives and goals for its operations, reporting, and compliance activities must be determined and established. These objectives should be high-level goals that are aligned with the organization's mission statement. The mission statement leads the company's senior management to develop strategic objectives to attain the mission, and those strategic objectives then lead to sub-objectives for operations, reporting, and compliance. The operations sub-objectives relate to the effectiveness and efficiency of the organization in achieving its goals, while the reporting and compliance sub-objectives cover how the organization reports its performance and complies with applicable laws and regulations.

3) **Event identification**. Events are internal and external occurrences that affect how the organization implements its ERM strategy or achieves its objectives. Types of events include:

   a. External economic events

   b. Natural environmental events (fires, floods, and so forth)

   c. Political events (new laws and regulations and results of elections)

   d. Social factors (changing demographics, for example)

   e. Internal infrastructure events (strong customer demand for a new product requiring additional plant capacity and employees)

   f. Internal process-related events (changes in processes that can trigger new risks)

   g. External and internal technological events (new services or products that become available because of technological improvements and require new processes to monitor the related risks)

4) **Risk assessment.** The core of COSO ERM, risk assessment is the process of analyzing and considering risks from three perspectives:

   - The **likelihood** of the risk occurring
   - The **potential impact** of the event if it does occur
   - The **interrelationship** of the risks on a unit-by-unit or total organization basis

   Note: Risk analytics is the use of software to quantify and calculate the risk exposure that results from various risks, to do simulation or scenario analysis, and/or to document risks and keep records of actual events and events avoided. The process of risk analytics depends on the information entered into the system in regards to the risk event. Thus, the result of the analysis will be greatly influenced by the accuracy or reality of the inputs.

   There are two types of risk that require particular assessment:

   a. **Inherent risk.** Inherent risk is defined by SMA: ERMF as "the level of risk in each event before any mitigation action is taken." The US Office of Management and Budget defines inherent risk as "the potential for waste, loss, unauthorized use, or misappropriation due to the nature of the activity itself." In general, inherent risk relates to risks that are a part of the very nature of the activities the company undertakes in the course of business.

      For example, inherent risks can result from the size of an organization. A very large company may face government regulation connected to the number of employees it has or the inter-state or transnational natures of its management structure. Also, specific events or activities may have different levels of inherent risk. For example, derivatives, when used for speculation, are inherently riskier than accounts receivable.

      Management cannot eliminate inherent risk, but it can address and mitigate it. For example, the potential for an earthquake to damage company property is an inherent risk of locating a business in a geologically active area of the globe such as the Pacific Rim—a company cannot

eliminate this risk. However, the company can mitigate the risk of earthquake damage by purchasing insurance.

b. **Residual risk** is defined by SMA: ERMF as "The level of risk that remains after management has taken action to mitigate the risk." No matter how many actions are taken, there is almost always going to be some amount of residual risk. For example, earthquake insurance includes a deductible clause that states the amount of any loss that the insured party is responsible for paying. The deductible amount is the residual risk.

Residual risk can be calculated using this formula:

	Inherent risk
–	**Activities of management to mitigate/address the risk**
=	**Residual risk**

5) **Risk response.** This category covers the actions a company can do with respect to each of the risks identified. The four basic responses available to management are:

a. **Avoidance**, for instance selling a business unit that creates risk

b. **Reduction**, such as diversifying a product line

c. **Sharing (transferring) the risk**, such as purchasing insurance

d. **Acceptance**, taking no action, or possibly self-insuring

In determining how to respond to each risk, management should consider the costs versus the benefits of each possible risk response and then it should decide which of the four strategies is best aligned with its overall risk appetite.

6) **Control activities.** These are all of the policies and procedures that are implemented to ensure that the risk responses are effectively carried out and implemented.

7) **Information and communication.** This broad category refers to all of the relevant information that needs to be communicated to the appropriate person within an adequate time frame so that duties can be properly performed. Information and communication link together each of the other components. Communication will be upwards, downwards, and across the entity. Information should flow from one COSO ERM component to another. For example, information from the risk assessment component and the objective setting component should flow to the risk response component. Information from the risk response component then flows to the control activities component and also becomes feedback to the risk assessment component.

8) **Monitoring**. The system put in place needs to be monitored to ensure that it continues to be appropriate and properly operated. The monitoring component has overall responsibility for reviewing all of the other functions.

Question 8: Virtucon Company identifies supply chain risks as part of their Enterprise Risk Management (ERM) process. After identification of this risk, Virtucon wants to determine how much of an impact this risk could have on their objectives. Their risk assessment should focus on

a) Both inherent and residual risk.

b) External but not inherent factors.

c) Only expected events.

d) Residual but not inherent risk.

(CMA Adapted)

Question 9: COSO's Enterprise Risk Management Framework includes several components. One component, internal environment, provides discipline and structure. Which one of the following is not considered to be part of the internal environment?

a) Control activities.

b) Risk management philosophy.

c) Board of directors.

d) Integrity and ethical values.

(CMA Adapted)

Question 10: Ziff Corporation has established a risk management process to help them create, protect, and enhance shareholder value. Which of the following reflects the best order for that risk process?

a) Objective setting, event identification, risk assessment, risk response.

b) Event identification, objective setting, risk assessment, risk response.

c) Risk assessment, risk response, objective setting, event identification.

d) Risk assessment, objective setting, event identification, risk response.

(CMA Adapted)

Benefits of ERM

The benefits of a well-developed and well-implemented ERM system are numerous and will vary from business to business. Some of the more common benefits are:

- An alignment of the entity's strategy and its appetite for risk
- An improvement in risk response decisions
- A reduction in the number and impact of operational surprises and losses
- The identification and management of multiple and cross-enterprise risks
- An improved ability to act on opportunities that arise
- An improved utilization of capital and the resources of the company

Question 11: Communicating information related to risks is very important in enterprise risk management. Which individual is **most** likely in the best position to recognize problems as they arise related to customer product design needs?

a) Risk manager

b) Sales representative

c) Internal auditor

d) Production manager

(CMA Adapted)

Event Identification Techniques

An **event** is an incident or occurrence emanating from internal or external sources that affects implementation of the organization's strategy or achievement of its objectives. Events may have a positive or a negative impact, or both.

In **event identification**, management recognizes that uncertainties exist but it does not know if an event will occur, nor can it say for certain the timing or the precise impact of an event should it occur. The events that could impact a company can come from inside the company (internally) or outside the company (externally).

An organization should establish formal processes to review potentially significant risks in order to decide which of those events need further attention.

The following techniques for identifying risk events come from *COSO Enterprise Risk Management—Integrated Framework*:

- **Event inventories.** These are detailed listings of potential events common to companies within a particular industry, or to a particular process or activity common across industries. Software products can generate relevant lists of generic potential events, which some entities use as a starting point for event identification. For example, a company undertaking a software development project draws on an inventory detailing generic events related to software development projects.
- **Internal analysis.** This may be done as part of a routine business planning cycle process, typically via a business unit's staff meetings. Internal analysis sometimes utilizes information from other stakeholders (customers, suppliers, other business units) or subject matter expertise outside the unit (internal or external functional experts or internal audit staff). For example, a company considering introduction of a new product utilizes its own historical experience, along with external market research identifying events that have affected the success of competitors' products.
- **Escalation or threshold triggers.** These triggers alert management to areas of concern by comparing current transactions, or events, with predefined criteria. Once triggered, an event may require further assessment or an immediate response. For example, a company's management monitors sales volume in markets targeted for new marketing or advertising programs and redirects resources based on results. Another company's management tracks competitors' pricing structures and considers changes in its own prices when a specified threshold is met.
- **Facilitated workshops and interviews.** These techniques identify events by drawing on accumulated knowledge and experience of management, staff, and other stakeholders through structured discussions. The facilitator leads a discussion about events that may affect achievement of entity or unit objectives. For example, a financial controller conducts a workshop with members of the accounting team to identify events that have an impact on the entity's external financial reporting objectives. By combining the knowledge and experience of team members, important events are identified that otherwise might be missed.

- **Process flow analysis.** This technique considers the combination of inputs, tasks, responsibilities, and outputs that combine to form a process. By considering the internal and external factors that affect inputs to or activities within a process, an entity identifies events that could affect achievement of process objectives. For example, a medical laboratory maps its processes for receipt and testing of blood samples. Using process maps, it considers the range of factors that could affect inputs, tasks, and responsibilities, identifying risks related to sample labeling, handoffs within the process, and personnel shift changes.

Cost-Benefit Analysis in Risk Assessment and Decision Making

Ideally, a company would mitigate every risk and eliminate loss. However, it is not possible to reduce the probability of loss to zero and nearly all risk mitigation responses have costs. The cost may be a direct dollar amount that needs to be paid, or it may be an indirect cost such as time or other opportunity costs. Management might decide not to address a risk if the cost of responding to it is greater than the amount that might be lost should the risk event occur.

For example, a company would not pay $2,000 to buy an insurance policy to cover a potential loss of $1,000. Furthermore, some risks may be negatively correlated and serve as natural hedges for one another, so they should not be responded to.

The costs of the risk response and the potential loss from a particular risk event may be difficult to calculate or assess. However, a cost-benefit analysis must be done for all risks to determine whether or not they should be addressed. The company will need to determine an expected value for both the cost of the risk response and the potential loss from the occurrence of the event.

Answers to Questions

1 d – Legal risk includes the legal system in which the company operates and the risks of losses from legal cases.

2 c – Operational risks are risks that that result from inadequate or failed internal processes, people or systems. Failure to perform bank reconciliations for six months is an example of a failed internal process.

3 a – Riverfront was not in compliance with laws and regulations. The owner has created compliance risk, which is operational risk. Compliance risk is the current or future risk to profits or the company's assets as a result of violations of, or nonconformance with, laws, rules, regulations, required practices, internal policies and procedures, or ethical standards. While it is true that the remaining inspections could determine that the building is uninhabitable, the risk created is compliance risk that is due to noncomformance with laws requiring satisfactory inspections and a certificate of occupancy before allowing tenants to move in.

4 d – Value at risk provides a confidence interval which provides a range of results with a percentage chance that the result will be within that range.

5 d – By moving the risk away from themselves to another party, Buckeye Conferencing is transferring the risk of loss to another party, though insurance is not involved. This is a noninsurance risk transfer.

6 a – When the risk of loss is high and the likelihood is high, the best course of action is probably to avoid the risk. This might include selling the business unit or in some other way eliminating the risk-generating activity from the company.

7 b – Corporate governance is concerned with the achievement of the corporation's objectives. Enterprise Risk Management assists the organization in the achievement of its objectives because it identifies the organizations' objectives that are at risk. Therefore, Enterprise Risk Management is aligned with corporate governance.

8 a – Supply chain disruption is a common risk, and it entails both inherent and residual risk. Suppliers do have problems and can sometimes be unable to supply a product, perhaps because of production difficulties or because of problems getting product from their own suppliers. The risk is inherent because occasional difficulty in obtaining a product is just a natural part of the process of ordering. As a response to the risk of supply chain disruption, a company should make sure it has more than one supplier at all times for every item it uses. However, even if the company has several suppliers, some residual risk still remains. For example, if only one manufacturer is producing an item and that manufacturer has production problems, all of the company's suppliers will be unable to obtain that item and thus none of them may be able to fulfill a given order.

9 a – The risk management philosophy of the company, the attitude toward risk of its Board of Directors, and the integrity and ethical values that make up the culture of the company are all parts of the internal environment. Control activities are a separate component of ERM.

10 a – The proper order for the four ERM components given is objective setting, event identification, risk assessment, risk response.

11 b – Sales representatives are in constant contact with customers, so they would be in the best position to recognize a problem related to customer product design. The other people named do not have contact with customers.

12 b – In any delegation, it is critical that the task or outcome be precisely defined. Additionally, it is good if there is discussion about how it will be done. The manager does not want to dictate how it should be done and also should not let the subordinate decide how it will be done, because that may lead to a lot of wasted time and resources if the subordinate chooses an inappropriate method for completing the task.

13 b – A mechanistic approach is used when there is an assembly line type system where there is not a need for a lot of decision-making. This system is motivated by efficiency and trying to produce as much as possible.

14 a – In a dynamic and complex environment, the company will face more uncertainty because the environment is changing. As a result, it will need a more organic structure in order to react better to the changes.

15 c – Discount stores gain their market edge by selling at a lower price and therefore need to minimize their costs. This is done by not offering as much sales help or the more "decorated" stores as their competitors provide.

16 a – As companies grow, they tend to expand their efforts and the products or services they offer. Their expansion may also be outside of their initial industry as well as within it.

17 c – By definition, in a professional bureaucracy, management has to give up a lot of control.