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An Examination of Project Risk Identification and Prevention Techniques in Ensuring Project Success; A Case Study of Electricity Company of Ghana (ECG)

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Abstract

Project risk management is the systematic process of identifying, analyzing, and responding to risk by applying risk management principles and processes at the project level. This is seen to be a very big challenge to most project managers. Research has proven that most projects that are executed face serious challenges as far as risk is concerned due to lack of appropriate techniques in identifying and preventing risk. Therefore the study intends to evaluate risk identification and prevention techniques in ensuring project success in Electricity Company of Ghana ECG with the objective of examining how efficient and effective the Project Management Team manages risk and whether the success of project depends on effective risk management identification and prevention techniques in project management of Electricity Company of Ghana (ECG).

The study intends to adopt the cross section survey technique in that it will be necessary to interview key personnel within the entire stratum of Electricity Company of Ghana (ECG) especially those activities impinge upon risk and project success. Qualitative information will be obtained and analyzed in order to address the objectives of the study. Where necessary such information will be quantified using relevant Statistical Packages for Social Science (SPSS) to enhance the direction of the study. The study seeks to find out whether project success depends on the following for effective risk management and strategies for effective project risk identification:

- *Risk Analysis and Evaluation*
- *Risk Monitoring and Reviewing*
- *Risk Communication*

It also seeks to find out if Electricity Company of Ghana (ECG) has a Project Risk Management Plan and Risks that are identified before projects are initiated and that if Electricity Company of Ghana (ECG) has competent project management professionals.

Introduction

A project is a temporary endeavor undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end. The end is reached when the project‘s objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists. Temporary does not necessarily mean short in duration. Temporary does not generally apply to the product, service or result created by the project; most projects are undertaken to create a lasting outcome. For example, a project to build a national monument will create a result expected to last centuries. Projects can also have social, economic and environmental impacts that far outlast the project themselves. (*PMI 2008*)

Every project creates a unique product, service or result and this comes with risk. Although repetitive elements may be present in some deliveries, this repetition does not change the fundamental uniqueness of the project. For example office buildings are constructed with the same or similar materials or by the same team, but each location is unique – with a different design, different circumstances, and different contractors and so on. Risk will however occur if there is failure to appoint a fully qualified and supported project manager, failure to estimate costs accurately or failure to understand who the project is for. (*PMI 2008).*

Project Management is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements. Project Management is accomplished through the appropriate application and integration of project scope activities with project management processes comprising the 5 Process Groups. These 5 Process Groups are;

- Initiating
- Planning
- Executing

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- Monitoring and Controlling and
- Closing

Risk is a major factor considered during the management of any project. Project management must control and contain risk if any project is to stand a chance of being successful. Risk can be the uncertainty of outcome (whether positive opportunity or negative threat). Some amount of risk taking is inevitable if any project is to achieve its objectives. Risk control refers to assuming a risk but taking steps to reduce, mitigate, or otherwise manage its impact or likelihood. Risk control can take the form of installing data-gathering or early warning systems that provide information to assess more accurately the impact, likelihood, or timing of a risk. If warning of a risk can be obtained early enough to take action against it, then information gathering may be preferable to more tangible and possibly more expensive actions. (imperial.ac.uk/ictprojectprocess/pmtools/riskmanagement).

A project is usually deemed as successful if it meets requirements (of measures such as functionality, reliability, maintainability, portability, efficiency, integration and operability) is delivered on time and delivered within budget (Powell and Klein, 1996). May (1998), citing a 1995 Standish survey, advises that only one-sixth of all projects were completed on time and within budget, one-third of all projects were cancelled and over half were considered challenged‘. Keil, Cule and Lyytinen (1998) assert that the high failure rate is due to managers not taking cautious measures to assess and manage the risks involved in projects.

A study conducted by Ewusi-Mensah and Przasnyski (1991) showed that 35% of abandoned projects are not abandoned until the implementation stage of the project‘s life cycle. This suggests that project managers are doing a poor job of identifying or terminating projects that are likely to fail. While there are many different modes of failure, one that has occurred very often is the project that takes on _a life of its own‘. It continues to absorb valuable resources without ever reaching its goal (Keil, 1995). Eventually these projects are abandoned but the cost of having funded them can result in a loss of organizational resources.

Project risk management is an approach that attempts to formalize risk oriented correlates of development success into a readily applicable set of principles and practices (Ropponen and Lyytinen, 2000). It incorporates techniques and guidelines to identify, analyze and control risk. Risk management is aimed at taking counter measures to either prevent risks from affecting the project or to reduce their impact (Heemstra and Kusters, 1996), and should be viewed as a fundamental component of the project management process (Powell and Klein, 1996). Ropponen and Lyytinen (2000) believe that by including risk management in a project the exposure to risk can be reduced and can thereby increase project quality and improve development.

Electricity Company of Ghana (ECG), the company under the study takes numerous projects of different variety of which risk is inevitably.

It is on this basis that the topic ‒an examination of risk identification and preventive techniques in ensuring project success‖ becomes necessary. The researcher, Project Management expert, has seen the need to examine various risk that are likely to affect smooth project completion and possibly come out with salient techniques that may enhance avoiding risk in project process.

Literature review

Project Risk

Project Risk is defined as a probability or threat of a damage, injury, liability, loss, or other negative occurrence, caused by external or internal vulnerabilities, and which may be neutralized through pre-mediated action, Graham (2005). From the definition, a risk is something that may happen and if it does, will have a positive or negative impact on a project. Project successes depend a lot on risk. There are a few points worth noting. "That may happen" implies a probability of less than 100%. If it has a probability of 100% - in other words it will happen - it is an issue. An issue is quite different and it is managed differently to a risk. An issue is a phenomenon that follows and is caused by some previous phenomenon. A risk must also have a probability, for instance, something above 0%. It must be a chance to happen or it is not a risk. The second thing to consider from the definition is "will have a positive or negative impact". Most people dive into the negative risks but what if something goes right? The concept of risk can thus be said to have three elements: These are;

- The perception that something could happen.
- The likelihood of something happening.
- The consequences if it does happen.

In business, risk is defined as the uncertainty of an outcome Graham (2005). When applied to investments, risk is the uncertainty of the return that will be earned. For example, a company incurs a risk when entering a new market because of the uncertainty as to how their product will be received by consumers. Risk for businesses results from a variety of factors that range from not being able to accurately forecast interest rates to unexpected inflation (or deflation).

Therefore, project risk is a possible event that could endanger the planned course or goals of the project. The earlier potential risks are identified, the quicker effective corrective actions can be implemented or the degree of likelihood that a project will not be completed on schedule and within budget.

Project risk management

Effective risk management entails clearly identifying each risk, and estimating it in terms of its probability and impact and controlling it by taking appropriate action and ensuring such actions have, and continue to have, the desired effect (Crockford & Neil (1986).

Before getting into the details of risks, a project must determine the Risk Management Strategy (RMS) which describes how risk management will be both used and implemented within the project. The risk management strategy should include, amongst other aspects (Crockford & Neil 1986):

(a) particular tools and techniques to be used

(b) the responsibilities for risk management actions

(c) The procedure for risk management, such as Identify, Assess, Countermeasures/actions, implementation and communication.

(d) The scales to be used for calibrating and estimating probability and impact

(e) The reporting and timing of risk management activities, such as at the end of each project stage

(f) The risk categories as to be defined, the action categories, definition of risk proximity, and risk trigger indicators.

(g) For contingency or fallback actions, a risk budget should also be agreed. This budget is used to pay for any such risk actions should they be needed.

(h) When using management by exception, the risk tolerance or ―risk appetite‖ should be agreed between the project manager and the project board.

Tolerance is an allowable variation of typically time and cost that the project manager can ―use‖ to allow for small deviations and estimating errors. Should at any point, the project or stage be forecast to exceed this tolerance, the Project Manager must escalate the situation up to the next level of management, who need to make a decision on what to do next (Crockford & Neil 1986).

However, the tolerance used may be risk tolerance. In such case, discussions should be had between the project board and project manager, about how much risk can be tolerated (―risk appetite‖). Factors such as particular risk impacts increasing beyond a particular value, or their probability increasing in the same way. It might be risks under a particular category – such as those affecting corporate image, that may be the escalation triggers.

A Risk Register should be created early in the project, and used to capture all details and the status of each risk identified. The project manager is responsible for ensuring that risks are managed properly but there will be the need for risk owners for all risks, and these owners may be other people involved in the project. They should be chosen as the best person to keep an eye on the risk. The owners may be the person required to implement risk action, or to act as a ―forward scout‖ to report risk status back to the project manager

The first step in the risk management procedure is to identify the risks, and this is normally done within a risk workshop. Other useful sources of possible risk identification, is to review lessons from previous projects. Yet more sources include organizational risk checklists, or the use of industry-wide checklists or tables.

Many people make the mistake of naming risks such as ―there is a risk in that, the project may come in late‖ — but this is a mistake, because the statement is not naming the risk itself, but its impact. This is where ―Fish-bone‖ or Ishikawa Diagrams can be useful in separating the risk event, its cause, and the effect (the risk impact)

It is helpful to consider that the source of the risk is called the risk cause (the potential trigger points for each risk), the risk event describes the area of uncertainty, and the risk effect which describes the risk impact on the project objectives. The next step is to estimate and evaluate each risk, and there are various estimation techniques that may be used **(Crockford & Neil 1986):**

- *Probability trees*: These are diagrammatic representations of possible risk events shown as linked

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rectangles each with a probability and impact. When linked together, the aggregated value of project risk can be determined. This helps the decision- makers to determine possible outcomes, and ensures suitable actions can be implemented.

- *Expected value*: This technique multiplies the cost of the risk impact with the probability of the risk occurring.
- *Pareto Analysis*: This is often called the 80/20 rule, from the observation that 20% of the risks will have the most impact on a project, and allows management to focus their attention on managing and controlling those risks.
- *The probability impact grid*: This is a table with the vertical axis scaled in probability and the horizontal axis scaled in impact. Suitable scales are determined, typically 10% probability, as very low through to very high between 70 to 90% of ability. The impact scale usually covers from very low to very high. The grid is used to provide an assessment of the severity of a risk and so enable risks to be ranked such that management effort can be prioritized.
- *The summary risk profile*: This again is a grid of probability against impact, but instead of measuring the severity of each risk (probability times impact), it plots each risk as a number much like a scatter diagram so that the spread and severity of risks can be directly seen. For example any risks which have a very high impact and probability would be seen as severe threats and this will enable appropriate actions or counter measures to be determined.

The next step is to plan the appropriate responses, both for threats and opportunities. There are many ways to describe such actions, but the following are most often used:

For Threats:

- *Avoid*. An action is planned for the project to do something different, such that the threat can either no longer have an impact on the project and/or its probability is zero.
- *Reduce*. An action is planned to either reduce the probability of the risk occurring, and/or to reduce the impact of the event should it occur.
- *Fallback* (often called Contingency). An action is planned but only implemented should of the linked risk occur.
- *Transfer*. An action is planned that reduces the financial impact of the threat. Usually, the action is via some form of insurance, or an appropriate clause in a contract so that the other party bears the financial pain.
- *Accept*. This is the ‑take no action‖ option. The threat should still be continuously monitored to ensure that it remains tolerable. This action is often chosen because the risk has a low probability and/or a low impact, or that the costs and effort of any actions outweigh the severity of the threat.

Threat or Opportunity:

- *Share*. Often carried out within contracts using third parties, where a pain/gain formula is agreed should the threat or opportunity occur.
- Opportunities:
- *Exploit*. Taking action to ensure that the opportunity will happen and that the positive impact will be realized.
- *Enhance*. Taking proactive actions which either enhances the probability and/or the impact of the event.
- *Reject*. A decision taken not to exploit or enhance the opportunity.
- All of the above actions are captured and entered within the risk register, and project or stage level plans have the above activities and resources added.

It is helpful to include the proximity for each risk. This is the time frame of the risk event occurring from the present day. This is helpful in focusing resources on actions for risks in the near future. But it is also helpful in determining when each risk event will occur, as this will have an effect on the severity of the impact.

Throughout a project, new risks can be identified, and existing risks can change their status, for this reason risk management should be seen as an ongoing activity throughout the entire project. It should also be remembered that as issues arise, these can in themselves impact existing risks or cause new risks.

At the end of each stage of a project, the total risk situation needs to be calculated, and used as part of the data for management to make an informed decision as to whether to proceed with the project or not. At the end of a project, as part of closure, any outstanding risks which would therefore have an impact on the end product‘s operational life should be found a new owner, so that such risks can continue to be successfully

managed and controlled. Risk Management is an essential part of any programme or project and can vastly contribute to successful delivery.

Project risk management focuses on the management of these various types of risks related to a project. The process of project risk management is carried out in a number of steps. Nevertheless, there are two principal phases of project risk management and they are assessment of risk and risk control. Project risks can be minimized with the help of eliminating or decreasing them. Assessment of risk may be carried out at any point of time

within the duration of the project. However, the earlier it is performed, the better it is for the organization. Risk can also be controlled. Risk control refers to assuming a risk but taking steps to reduce, mitigate, or otherwise manage its impact or likelihood. Risk control can take the form of installing data-gathering or early warning systems that provide information to assess more accurately the impact, likelihood, or timing of a risk. If warning of a risk can be obtained early enough to take action against it, then information gathering may be preferable to more tangible and possibly more expensive actions.

According to Crockford & Neil (1986), risk control is always dependent on a proper risk assessment. On the other hand, if risk control measures are not undertaken, there is no use of performing a risk assessment. The process of project risk management can be elaborated as follows:

- Project Risk Assessment : The process of project risk assessment can be further categorized into the following:
  - *Identification of risk*: The project risks are identified by examining the whole project plan.
  - *Analysis of risk: Risk analysis can be quantitative or qualitative in nature. In this process, the manner in which the project risks may influence the project performance in terms of expenses, time period or satisfaction of the necessity of the customer is ascertained.*
  - *Prioritization of risk: According to this process, it is determined that which risks require total elimination, which risks require continuous supervision and monitoring and which risks are* not so important to supervise.
- Project Risk Control: Project risk control involves the following steps:
- Avoidance of risk: A plan is chalked out as to how project risks can be eliminated or avoided.
- Risk transfer: In this way, risk is transferred by buying insurance policies.
- Risk mitigation: A number of measures are taken beforehand for minimizing the impact of risk.
- Contingency plan: For risks that are regarded as important, a contingency plan is prepared in advance before those risks occur.
- Risk acceptance: Certain risks are accepted because they are regarded as small and do not influence the performance of the company to a significant degree.
- Measure and control: Observing the outcomes of the risks that have been detected and handling them to a favorable or productive end.

Project risk management is undertaken primarily to improve the chances that a project will achieve its objectives. While there are never any guarantees, broader awareness of common failure modes and ideas that make projects more robust can significantly improve the odds of success. The primary goal of project risk is either to develop a credible foundation of each project showing that it is possible or to develop a credible foundation for each project showing that it is possible or to demonstrate that the project is not feasible so that it can be avoided, aborted or transformed (Crockford & Neil 1986).

Risk management offers genuine and significant benefits to organizations, their projects and their stakeholders, but these will never be achieved without recognition of the importance of managing risk at all levels in the business, matched with operational effectiveness in executing risk management in practice.

Risk management has become one of the most important aspects of project management. As companies become better at managing projects, the significance of risk management becomes more important. Many companies are not yet adept at determining project cost, schedule and scope baselines and have not yet learned to manage the work that is actually going to have to get done in the project. Until this is done it does not seem worthwhile to consider risk management. The components of risk identification, probability and impact must all be considered in order to determine how to deal with a risk. The combination of impact and probability determine the severity of the risk. The severity of the risk determines its importance in ranking among other risks (Crockford & Neil 1986).

Developing a project plan with thorough risk analysis can involve significant effort, which may not seem necessary to many project stakeholders and even some project leaders. In fact the benefits and uses of

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appropriate project risk analysis more than justify this effort. Among other benefits of project risk management are;

- It lowers cost and lessens chaos. Adequate risk analysis reduces both the overall cost and the frustration caused by avoidable problems. The amount of re-work and of unforeseen late project effort is minimized. Knowledge of the root causes of the potentially severe project problems enables project leaders and teams to work in ways that avoid these problems. Dealing with the causes of risk also minimizes ‒fire- fighting‖ and chaos during projects, much of which is focused short-term and deals primarily with symptoms rather than the intrinsic sources of the problems.
- There is project priority and management support. Support from managers and other project stakeholders and commitment from the project team are easily won when the project are based on thorough, understandable information. High risk projects may begin with lower priority, but a thorough risk plan displaying competence and good preparation for possible problems can improve the project priority of a project and significantly reduce project risk – by opening doors, reducing obstacles, making resources available and shortening queues for services.
- Management of project portfolio. Achieving and maintaining an appropriate mix of ongoing project for an organization uses risk data as a key factor. The ideal project portfolio includes both lower-risk and higher risk projects in proportions that are consistent with business objectives.
- Fine-tuning plans are employed to reduce risk: Risk analysis uncovers weaknesses in a project plan and triggers changes, new activities and resources shifts that improve the project. Risk analysis at the project level may also reveal needed shifts in overall projects structure or basic assumptions.
- An establishment of management reserve: Risk analysis demonstrates the uncertainty of project outcomes and is useful in setting reserves for schedule and or resources. Risky projects really require a window of time (or budget), instead of a single point objective. While the project targets can be based on expectation (the ‒most likely versions of the analysis), project commitments should be established with less aggressive goals, reflecting overall project risk. The target and committed objectives

set a range for acceptable project, results and provide visible recognition of project risk. For example, the target schedule for a risky project might be twelve months, but the committed schedule, reflecting the uncertainty, may be set at fourteen months. Completion within (or before) this range defines a successful project, only if the project takes more than fourteen months will it be considered a failure. Project risk assessment data provides both the rationale and magnitude for the required reserve.

Proper risk identification and management also yields benefits both to the project and to other stakeholders. The project increases its probability of satisfying its stakeholders. This yields job satisfaction and career benefits to the individual project team members, especially the project manager. It also improves the team's collective identity, morale and spirit, which will be of benefit if the same team goes on to tackle other, perhaps even more challenging tasks.

Furthermore, since the risk management system allows risks to be openly spoken of, it allows project team members to share their worries openly, rather than feel obliged to suppress any mention of the negative. This makes it easier for the project to manage stress levels.

And for the stakeholders, the existence of a proper risk management system reduces the chance of unpleasant surprises.

Project Management can be said to be of fast growing importance to organizations whether large or small because it deals effectively with the management of change. As a small business owner one knows that his or her business environment is changing all the time. As a business owner also, that successful project management is all about setting and achieving reasonable and attainable goals. In business, project management is an art, a skill, and a demanding full-time job. The fact of the matter is that project management is a human issue of people needing to work together. And for an individual as the business owner he or she remains the leader when it comes to project management (Belfatti, 2006).

Project management is about being able to create transparency and build trust. It‘s about finding solutions that help each team member be better in what they are doing while building teamwork. Project management tracks actual progress against the goals and timelines set

forth before the project even began. This permits a better understanding of whether one should adjust his or her strategy, staffing, or timelines in light of the way in which the project is developing (Belfatti, 2006).

A project manager can do some very useful things. Balancing limited labor, materials, and other resources is a difficult task. And eventually one is going to need people that can do that on a consistent basis. For as a

business grows so too will its projects. And as one‘s own tasks become even more varied, the one is going to need good project managers because he or she will not always be able to look over their shoulders. One has to be able to trust that they can deliver what they promised someone. And for whoever is tasked with delivering a project ‒on time and under budget‖ they can expect a great deal of job satisfaction assuming that will also be recognized by their good work. The job offers the opportunity to lead, and new projects keep the work fresh and challenging.

Typically, projects are managed by focusing on the delivery of the tasks that make up the project, in the seemingly reasonable belief that if these tasks are done on time, the project will be done on time as well. No wonder project management is such a challenging endeavor. Protecting the value of a project involves dealing with the uncertainty that will be associated with its delivery. The role of project management is to assist in turning uncertain events and efforts into certain outcomes and promises. The project manager has a lot of responsibility thrust upon him or her. But hopefully with experience will come consistent success. For many businesses the types of projects encountered are similar. If houses are built for a living then each house that is built will be unique in its own ways but it will share many similarities with other houses already built. If that experience is capitalized on then there would be many more successes.

Project management is thus a skill valued in every major industry. Project management is rapidly becoming a key skill that underpins progress and prosperity. As many projects grow larger and more diverse, hiring people who have that experience will be of great value to businesses.

Types of risk management

There are different types of risk management and the characteristics and procedures of each type of risk management are different from the other. All these risk management processes play a significant role behind the growth of an organization in the long term. Commercial enterprises apply various forms of risk management procedures to handle different risks because they face a variety of risks while carrying out their business operations. Effective handling of risk ensures the successful growth of an organization. According to CAS ERM Committee (2003), various types of risk management can be categorized into the following:

- Operational risk management: Operational risk management deals with technical failures and human errors.
- Financial risk management: Financial risk management handles non-payment of clients and increased rate of interest.
- Market risk management: Deals with different types of market risk, such as interest rate risk, equity risk, commodity risk, and currency risk. This is the most familiar of all risks. Also referred to as volatility, market risk is the the day-to-day fluctuations in a stock's price. Market risk applies mainly to stocks and options. As a whole, stocks tend to perform well during a bull market and poorly during a bear market - volatility is not so much a cause but an effect of certain market forces. Volatility is a measure of risk because it refers to the behavior, or "temperament", of one‘s investment rather than the reason for this behavior. Because market movement is the reason why people can make money from stocks, volatility is essential for returns, and the more unstable the investment the more chance there is that it will experience a dramatic change in either direction.
- Quantitative risk management: In quantitative risk management, an effort is carried out to numerically ascertain the possibilities of the different adverse financial circumstances to handle the degree of loss that might occur from those circumstances.
- Country Risk - Country risk refers to the risk that a country would not be able to honor its financial commitments. When a country defaults on its obligations, this can harm the performance of all other financial instruments in that country as well as other countries it has relations with. Country risk applies to stocks, bonds, mutual funds, options and futures that are issued within a particular country. This type of risk is most often seen in emerging markets or countries that have a severe deficit.
- Commodity risk management: Handles different types of commodity risk, such as price risk, political risk, quantity risk and cost risk.
- Bank risk management: Deals with the handling of different types of risk faced by the banks, for example, market risk, credit risk, liquidity risk, legal risk, operational risk and reputational risk.
- Nonprofit risk management: This is a process where risk management companies offer risk management services on a non-profit seeking basis.
- Currency risk management: Deals with the changes in currency prices

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- Enterprise risk management: Handles the risk faced by enterprises in accomplishing their goals.
- Project risk management: Deals with particular risk associated with the undertaking of a project.
- Integrated risk management: Integrated risk management refers to integrating risk data into the strategic decision making, of a company and taking decisions, which take into account the set risk tolerance degrees of a department. In other words, it is the supervision of the market, credit, and liquidity at the same time or on a simultaneous basis.
- Technology risk management: It is the process of managing the risk associated with the implementation of the new technology.
- Software risk management: Deals with different types associated with implementation of new software.
- Strategic Risks: for example a competitor coming on to the market.
- Compliance Risks: for example the introduction of new health and safety legislation.
- Financial Risks: for example non-payment by a customer or increased interest charges on a business loan.
- Operational Risks: for example the breakdown of key equipment.
- Environmental Risks: like disasters.
- Employee Risks: supplying necessary number of employees, safety and health issues.
- Political and Economic: instable political status in foreign markets you export goods to. Political risk represents the financial risk that a country's government will suddenly change its policies. This is a major reason why developing countries lack foreign investment.
- Liquidity risk: arises from situations in which a party interested in trading an asset cannot do it because no one in the market wants to trade in the asset. Liquidity risk becomes particularly important to parties who are about to hold or currently hold an asset, since it affects their ability to trade.
- Volatility risks in the financial market are the likelihood of fluctuations in the exchange rate of currencies. Therefore it is a probability measure of the threat that an exchange rate movement poses to an investor‘s portfolio in a foreign currency. The volatility of the exchange rate is measured as standard deviation over a dataset of exchange rate movement.
- Foreign-Exchange Risk - When investing in foreign countries you must consider the fact that currency exchange rates can change the price of the asset as well. Foreign-exchange risk applies to all financial instruments that are in a currency other than your domestic currency. As an example, if you are a resident of America and invest in some Canadian stock in Canadian dollars, even if the share value appreciates, you may lose money if the Canadian dollar depreciates in relation to the American dollar.
- Interest Rate Risk - Interest rate risk is the risk that an investment's value will change as a result of a change in interest rates. This risk affects the value of bonds more directly than stocks.

Risk management processes phases

As risks are, due to their nature, strongly connected, they cannot be managed in a fragmented manner by independent functions and/or departments, but a dedicated process is necessary that, as such, requires a structure, an organization and communication mechanisms.

Traditionally, the phases of a Risk Management process are as follows:

1. Context definition;
2. Risk identification;
3. Risk assessment;
4. Risk treatment;
5. Risk Communication;
6. Risk Planning;
7. Checking and supervision;
8. Process review.

To be effective, each of these phases (and, obviously, the entire Risk Management process that unites them), as previously mentioned, must be fully integrated within the wider scope of the company organisation.

Context definition

Context definition implies:

- Identifying the areas of risk that must be considered, due to the specific combination of market, product/service, manufacturing/supply process as well as external references (institutions, suppliers, banks, unions, etc.);

- Congruently defining an identification and assessment activity schedule;
- Organizing the necessary resources, starting by defining duties and responsibilities.
- In this phase, therefore, the limits of the approach are recorded and the base for the development of the operative system is created, having a fundamental concept as reference criteria, which is the knowledge that:
- Potential risks can involve the organisation on all levels;
- The most negative consequences do not necessary refer to risks attributable to the short-sighted behavior of those who occupy upper management positions.

Risk identification

The next phase, which is related to identifying potential risks and their description, must be confronted by analyzing all possible sources of risk (such as, for example: the positions of the stakeholders, market changes, manufacturing errors or work accidents, etc.), within the areas of risk that were taken into consideration when defining the context.

The process of identifying potential risks must, in any case, work for the type of organization and, therefore, for the type of product/service offered and the type of market in which the organization itself operates; it normally refers to:

- the objectives, which the organization has set for itself;
- the scenarios, which the organization may find it must face in carrying out its business;
- The procedures or practice, which the organization adopts for management and operational purposes.

Potential risks do not generally represent an effective risk if the organization does not have, in reference and at the same time, a specific weakness. This concept, which is based on the modern approach of Risk Management, therefore foresees the creation of a list of

–vulnerabilities‖ (structural, managerial or operative) concerning the areas of risk being considered, over which the corresponding list of the sources of risk must be critically superimposed.

Effective risk identification finally requires the support of reasonable confirmations, objective if possible, regarding the correctness of the analysis. These confirmations may be:

- of a direct experimental nature (the event has already occurred)
- of an indirect experimental nature (the event has already occurred in a similar situation)
- Of a deductive nature (the cause – effect relationships make the event appear probable).

In this way, a **"risk profile"** is outlined that is specific to each organisation (by context and vulnerability), to which the subsequent actions refer.

Risk assessment

When the risks have been identified, they must be assessed (Risk Assessment) based on:

- The probability that the negative event will occur;
- The seriousness of the direct or indirect consequences of the event itself.

This assessment can be more or less simple, based upon the specific situation, as what is relevant for the purpose is the availability of usable statistical data as well as validated analysis procedures. The statistical data (usable) and the analysis procedures (validated) can only be acquired from similar (or apparently similar) situations if done in an extremely prudent manner and only after having verified the transferability of the conditions concerning both the sources of risk and vulnerability.

From the above, in conclusion, it results that the risk assessment process generally follows paths of analysis within an organisation that, in reference to:

- The likelihood of an event, refer to the potentiality of the relative risk source, the extent of the specific possible vulnerability and the level of effectiveness of the pre- existing control and reaction instruments;
- The seriousness of the consequences also refers, in addition to the type and extent of the damage, to the involved objectives (in a decreasing order of importance: the mission, the structure, the organization and operations).

Each potential risk must, however, be perceived with greater or less intensity, with regard to the real risk content, based upon the –force‖ with which the relevant information is made available, especially when there are specific sensibilities. Therefore, the assessment process requires a constant engagement directed toward the objectivity of the judgments, in fact, if the risks are assessed in an irrational manner and their corresponding priority is assigned in an improper manner, there could be a lack of coverage and/or defense

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and useful resources could be wasted that, if better applied, could lead to more effective management.

Once probability and consequences have been established, a ‒risk matrix‖ is usually prepared that relates to the ‒risk profile‖ created in the previous phase.

Risk Treatment

The treatment of the potential risks (Risk Treatment) is the phase in which the decision making processes become particularly important. It includes, either alternatively or in combination, one or more of the following conditions:

- The transfer of the risk;
- The exclusion of the risk;
- The reduction of the risk;
- The acceptance of the risk or an amount of the risk.

The selection of one or more of the previous conditions largely depends on the specific company situation (that is, the company‘s internal and external context as well as the company‘s real possibility to confront both of these contexts) and must be based on a cost- benefit analysis that is as quantitative as possible in reference to the short, medium and long- term period. Risk transfer: This condition foresees the persuasion of another party to accept the risk, through a contract. This is a typical case that concerns insurance companies, which is applied often when possible (for example, liabilities of a criminal nature cannot be transferred) even if at times it is done in a general manner and not, rather, in function of the specific organisation (tailored covering).

Risk exclusion: This condition foresees the non-execution of the activity that involves a risk that cannot be transferred and/or is considered to be unacceptable. Naturally, the result is a loss of opportunity that the activity at risk would have represented in any case.

Risk reduction: This condition involves the adoption of managerial, technological and behavioral actions that lower the probability of risk and/or the seriousness of the possible consequences. The persistence of residual risk is often, in any case, unavoidable both for reasons inherent to the context (institutional, managerial, technological, etc.) in which the organisation operates, as well as for the possible simplifications and/or omissions of the analysis.

Acceptance of an amount of the risk: All risks (or amounts of risk) that are not transferred and not excluded are, as a result, accepted. The conscious acceptance of residual risk occurs, in general, when at least one of the following conditions applies:

- Sufficiently low probability of the event;
- Consequences of the event are proportionally of little relevance;
- Great benefits if successful.

The risk (or the amount of risk) that is accepted must subsequently be controlled in agreement with what is foreseen by the following paragraph

Planning

Planning defines the risk control methods, that is:

- the acquisition, interpretation, sending and/or storing of incoming data for the control process;
- the appropriate level and localization for the decisions and actions connected to each type and condition of risk;
- the operative procedures and/or practice;
- the control instruments;
- The acquisition, interpretation, sending and/or storing of output data from the control process.

If the control plan is sufficiently broad and complex, it is recommended that the position of a Risk Manager is created, as it is an important position that is mainly directed toward coordinating all activities and their communication, although it does not have any direct responsibility for the risk itself.

The planning activity is documented and collected in a Risk Management Plan.

Risk communication

Risk communication is defined as any two-way communication between stakeholders about the existence, nature, form, severity, or acceptability of risks. It is vitally important to understand the basic concepts of risk communication and to ensure that communication among stakeholders is integral to the risk management process. The focus of risk communication has evolved since the mid 1980.s, from concern about how best to

inform the public about the technical aspects of risk assessments to a process of early and ongoing dialogue among stakeholders. While guidelines for risk communication have been prepared by various agencies, putting principles into practice is a long term process requiring considerable resources, time, and effort.

The profile, the matrix, the risk treatment (including the cost-benefit analysis) and the control planning must be documented in detail in a Risk Management Report, which must be presented to all personnel that is involved in any manner and who must not only acknowledge it, but must also share in the approach and evolution, each for his or her own area of interest and according to each person‘s level of responsibility.

If information only should not be enough, targeted training courses should be developed with the purpose of making the Risk Management Report an effective management instrument.

The Risk Management Report constitutes the document of reference for the entire Risk Management process.

1. Checking and supervision

Checking and supervision over time concerns (whenever applicable and possible) all control instruments (technical and managerial, preventive and supervisory, evasive and reactive, etc.) that were implemented, or planned to be implemented, in compliance with the Risk Management Plan, in order to verify its efficiency and effectiveness.

The checking and supervision results must be documented, evaluated and recorded.

2. Process review

Risk Management is a dynamic process and therefore it must be reviewed in a sufficiently frequent manner (Risk Management Review), based upon the experience gathered in a direct manner (within the organisation) or indirectly (outside of the organisation, in similar and comparable situations), with the purpose of:

- Evaluating possible evolutions that concern any phase of the process, which could cause changes to the risk profile, matrix and/or treatment (for example, but not only: a different risk context, a different criterion regarding the acceptable risk, a different cost-benefit analysis, etc.);
- Evaluating the efficiency and effectiveness of the adopted Risk Management Plan; evaluating the checking and supervising results.
- If revisions are made, another Risk Management Report must be created that is updated with regard to the changes that were made.

The need for project risk identification and control

Risk can be found everywhere **(Culp 2001, p. 3).** Furthermore, many of the critics say that the world is becoming more and more risky as time goes by **(Culp 2001, p. 4).** This is due to the fact that there are many important factors and aspect that help to create change that will eventually lead to risk. Globalization and innovation are consider as the two most important factors that help to move and push change in the global as well as in the local market and field. Innovation without the risk can be considered as paradoxical, this is due to the fact that risk is considered as the most naturally addressed more often in innovation **(Culp 2001, p. 4).** Due to innovation and globalization, many companies are planning and implementing different strategies with accordance to the development and improvement of their products that will later on can affect or create risk for them.

Although not all of risks are bad, it is important for any company to have a programme or implement an activity that will evaluate as well as analyze the different possible risk that might be encountered by the company in order to ensure that everything is at the right place. Risk analysis is considered as the technique that is used in order to identify as well as asses the different factors that may endanger the success of a given project and eventually achieving the goals of the company. It also helps in defining different preventive measures that can help to lessen the probability of different risk that will occur by identifying the different countermeasures that will successfully deal with the said constraints **(Mutinelli 2007).** It is part of the bigger study which is the risk management that is use in order to identify, furthermore analyze as many of the possible risks as possible, as early as possible, and eventually developing different strategies that will help to deal with them **(Harrison & Lock 2004, p. 178).**

The process of identifying the possible risk areas is the primary and considered as the most important as well as most painstaking step in the overall management of the risk. This is due to the fact that all of the entities as well as other aspects that are connected to the industry as well as to the business must be considered

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in order to know the different risk or threat that can be faced by the company in implementing any projects. The process of identifying the possible risk areas for every project of the company is important due to the fact that the business proper of the company focuses on gas distribution and the likes. Furthermore, any wrong move or failure of one specific project can greatly affect the physical and environmental condition of each and every individual as well as the economical condition of its overall market.

Identifying risks early in a project

The first step in project risk management is to identify the risks that are present in projects. According to **Lewis (2006),** techniques involve in identifying project risks require an open mind set that focuses on future scenarios that may occur and that there are two main sources exist to identify risks, people and document. People are the team members that each bring along their personal experiences and expertise. Other people to talk to are experts outside the project that have a track record with the type of project or work organisations are facing. Interviews and team sessions (risk brainstorming) are the common methods to discover the risks people know. Projects tend to generate a significant number of documents that contain project risks. The project plan, business case and resource planning are also good starter- techniques. Other categories are old project plans **(Lewis, 2006).**

Are the project team able to identify all project risks before they occur? Probably not. However if the team combine a number of different identification methods, they are likely to find the large majority. If they deal with them properly, they have enough time left for the unexpected risks that take place **(Wysocki, 2004).**

The effective management of project risks is an integral part of best practice project management. A formal risk management process is intended to introduce rigor, objectivity and consistency into what is typically a subjective process **(Lewis 2006).**

Initially, a brief risk assessment is done when proposing a new project for approval. Any identified high risk factors should be analyzed to determine whether actions can be undertaken to eliminate, reduce or constrain the risk before the project commences. This may require adjustments to the proposed project's scope, objectives, timelines or resources.

Once a project is approved, a Risk Management Plan should be developed for all risk factors that were not eliminated during the project proposal process. This should include a description of the risk, the impact of the risk on the project, what actions can be taken to assist in reducing the risk and, if necessary, a contingency plan. The Project Manager (PM) and team must seek the assistance of the Project Sponsor and stakeholders in the proactive reduction of risk **(Lewis 2006).**

Reduction of risk in a project is a 'win-win' situation with all project people gaining from the increased possibility of project success. However it often transpires that a project is exposed to risks that are beyond the PM and his or her organization to resolve. Dependence on outside organizations is one such risk factor.

There is an important relationship between project risk and the appropriate project development strategy. Risk can change as the project progresses. It is possible for a project initially assessed as low risk to quickly escalate into a high risk project. Any alteration of project risk factors must be subject to the standard change control mechanism **(Lewis 2006).**

It is also essential to understand that as risk assessment is subjective, different people will perceive risks differently. Risk assessment should record all views democratically with the majority view being accepted as the guide. Should a split decision result from the democratic process then the higher risk factor should be used.

The purpose of project risk identification and management is to obtain better project outcomes, in terms of schedule, cost and operations performance. According to **Lewis (2006),** project risk identification and management process is needed to ensure that:

- All significant risks to the success of the project are identified;
- Identified risks are understood, with both the range of potential consequences.
- They represent the likelihood of values in that range being determined as far as is necessary for decision-making;
- Assessment is undertaken of individual risks relative to the other risks to support priority setting and resource allocation;
- Strategies for treating the risks take account of opportunities to address more than one risk;
- The process itself and the risk treatment strategies are implemented cost-effectively.

The application of those processes to projects requires integration of risk management with project

management processes and activities.

The broad objectives of the project risk management process are to:

- enhance the capability of the organization;
- extend the organization ‘s overall risk management processes to projects, and apply them in a consistent way; and
- Enhance the management of projects across the organization and obtain better project outcomes, in terms of schedule, cost and operations performance, by reducing risks and capturing opportunities.
- Good project risk management within an organization has the following characteristics:
- project risk management activities commence at the initiation of the project, risk management plans are developed and risk management continues throughout the project life cycle;
- project risk management is not a discrete stand-alone process, but is integrated with other project management functions; and
- The implementation of project risk management is the responsibility of all project stakeholders and they participate actively in the process.

Project risk identification and monitoring strategies

The objective of risk management is to identify and manage significant risks. It involves several key phases, with feedback through a monitoring and review process. In most projects, risk management overlaps with other management processes and procedures, in that many of the steps are undertaken as part of normal project management. This provides the basis for integrating risk management and project management activities **(Lewis, 2006).**

According to **Lewis (2006)** risk identification and monitoring strategies involve the following processes/step:

i. Establish the context - What are we trying to achieve?
ii. Identify the risks - What might happen?
iii. Analyze the risks - What might that mean for the project‘s key criteria?
iv. Evaluate the risks - What are the most important things?
v. Treat the risks - What are we going to do about them?
vi. Monitor and review - How do we keep them under control?
vii. Communicate and consult - Who should be involved in the process?\

Establish the context

Establishing the context is concerned with developing a structure for the risk identification and assessment tasks to follow. This step:

- establishes the organizational and project environment in which the risk assessment is taking place;
- specifies the main objectives and outcomes required;
- identifies a set of success criteria against which the consequences of identified risks can be measured; and
- defines a set of key elements for structuring the risk identification and assessment process.

Context inputs include key project documents, such as the project execution strategy, project charter, cost and schedule assumptions, scope definitions, engineering designs and studies, economic analyses, and any other relevant documentation about the project and its purpose.

The output from this stage is a concise statement of the project objectives and specific criteria for success, the objectives and scope for the risk assessment itself, and a set of key elements for structuring the risk identification process in the next stage.

Identify the risks

Risk identification determines what might happen that could affect the objectives of the project, and how those things might happen. The risk identification process must be comprehensive, as risks that have not been identified cannot be assessed, and their emergence at a later time may threaten the success of the project and cause unpleasant surprises. The process should be structured using the key elements to examine risks systematically, in each area of the project to be addressed.

A number of techniques can be used for risk identification, but brainstorming is a preferred method because of its flexibility and capability, when appropriately structured, of generating a wide and diverse range of risks.

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Information used in the risk identification process may include historical data, theoretical analysis, empirical data and analysis, informed opinions of the project team and other experts, and the concerns of stakeholders.

The output is a comprehensive list of possible risks to the successful outcome of the project, usually in the form of a risk register, with management responsibilities (risk owners) allocated to them.

Analyze and evaluate the risks

Risk assessment is the overall process of risk analysis and risk evaluation. Its purpose is to develop agreed priorities for the identified risks.

- Risk analysis is the systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.
- Risk evaluation is the process of comparing the estimated risk against given risk criteria to determine the significance of the risk.

The assessment process:

- determines the consequences of each risk, should it arise;
- assesses the likelihood of those consequences occurring;
- converts the consequence and likelihood ratings to an initial priority for the risk; and
- Develop agreed risk priorities and inherent risk levels.

The agreed priorities are used to determine where the greatest effort should be focused in treating identified risks. They facilitate structured action planning and resource allocation. This stage of the risk management process generates a prioritized list of risks and a detailed understanding of their impacts upon the success of the project should they occur. The consequence and likelihood ratings and the agreed risk priorities are all recorded in the risk register.

Treat the risks

The purpose of risk treatment is to determine what will be done in response to the risks that have been identified, in order to reduce the overall risk exposure. Unless action is taken, the risk identification and assessment process has been wasted. Risk treatment converts the earlier analyses into substantive actions to reduce risks.

The primary inputs to this step are the lists of risks and their agreed priorities from the previous step and the current project plans and budgets.

Risk treatment involves:

- identifying the options for reducing the likelihood or consequences of each Extreme, High or Medium risk;
- determining the potential benefits and costs of the options;
- selecting the best options for the project; and
- Developing and implementing detailed Risk Action Plans.

Risk Action Plan Summaries are usually required for each risk classified as Extreme or High on the agreed risk priority scale.

Monitor and review

Review processes are often implemented as part of the regular management meeting cycle, supplemented by major reviews at significant project phases and milestones. Monitoring and review activities link risk management to other management processes. They also facilitate better risk management and continuous improvement. The main input to this step is the risk watch list of the major risks that have been identified for risk treatment action. The outcomes are in the form of revisions to the risk register, and a list of new action items for risk treatment.

Communicate and consult

Communication and consultation with project stakeholders may be a critical factor in undertaking good risk management and achieving project outcomes that are broadly accepted. They help owners, clients and end users understand the risks and trade-offs that must be made in a large project. This ensures all parties are fully informed, and thus avoids unpleasant surprises. Within the project management team, they help maintain the consistency and reasonableness ‘of risk assessments and their underlying assumptions.

In practice, regular reporting is an important component of communication. Managers' report on the current status of risks and risk management as required by sponsors and company policy. Senior managers need to understand the risks they face, and risk reports provide a complement to other management reports in developing this understanding.

The risk register and the supporting action plans provide the basis for most risk reporting. Reports provide a summary of project risks, the status of treatment actions and an indication of trends in the incidence of risks. They are usually submitted on a regular basis or as required, as part of standard management reporting. Major projects may require more extensive reporting on a periodic basis or at key milestones.

Results and discussion

Risk management involves assessing and quantifying business risks, then taking measures to control or reduce them. Risk Management also aims to facilitate the exchange of information and expertise across projects and across team members. In the findings the research revealed that managing risk at ECG was not very effective therefore its effectiveness can be concluded as average.

The purpose of risk management is to generate ideas and promote good practice for those involved in the business of managing risk. But then the study found that training which is key in every organization and refers to the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies was lacking in ECG. This is because the study found that training was mostly done as and when it became necessary for project team members. All too often assessments of risk are crudely made if training is ignored and the consequences of getting things wrong can be serious, including lost opportunities, loss of business, loss of reputation and even life.

Effective communication was found to be lacking at ECG during the survey. According to Duncan (2004) Communication between top management, middle management and project teams have to be two-way. There needs to be a feedback from both sides on their opinions about a particular project to ensure success and to ensure that everything that is done on that particular project is within scope. According to Duncan (2004) requirements and directions come from the management where as required resources or incidents come from the staff. From the study, it was realized that the Project Department of ECG lacked this two-way information as most decisions came only from the Project Department and not from the entire Management of ECG.

Again, Duncan suggested that by using the AS/NZS 4360 standard, there needs to be inputs from the staff and project managers. There is also a need to understand that though there is an internal risk management team doing risk management for projects; there is a need for third- party audits to assess whether the risk has been managed without any favoritism. Third-party audits will incur costs, but most importantly is that management must understand the importance and objectives of the third party audits. This was not found during the study at ECG as most staff's assessment of effectiveness on the part of ECG Project Department was average.

It is true that the lack of funding hinders every project's long-term success. But the fact of the matter is that modern day projects are such that colossal sums of money are required for their implementation. The major risk that may be mentioned is that of Completion Risk. This is a risk that the project may not be completed on time or at all due to technology failures, cost overruns, and certain necessary variations. If the project is not on schedule, interest builds up and there may not be sufficient funds to cover the interest. Project lenders are often not prepared to take non-recourse completion risk and therefore require either a completion guarantee or a guarantee of loans provided.

Again, project finance almost invariably involves a syndicate of lending banks who independently appraise the project from their capital base before making any commitments. The whole principle of each bank bearing a portion of the total commitment gives the individual bank the comfort that it otherwise would not have enjoyed had the lending been carried out solely by one bank. The risk of lending is shared and no one lender over stretches its resources in financing a project only to find that it may not be able to discharge its loan obligations within the time frame of a sole bank. It is from this background that it was realized projects found it difficult to get finance thus lack of funding is a mere challenge in ECG during its execution of Projects.

The study revealed that majority of staff members in the project department are qualified. This particular objective become necessary in that project risk preventive techniques is a sensitive area in project management and needed so much in an ongoing project which needs technocrats to manage that. In project and any other business activities, risk is an element difficult to deal with and cannot also be eliminated. What is important is to have preventive techniques to either moderate or stop the risk entirely from happening.

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The study was found that most members on the project are quite efficient; the study also found that staff from project department appears very efficient. Efficiency is necessary and paramount in any project especially in areas of risk management and preventive techniques for project success. It is clear from the findings that members on project are quiet efficient but the question is; are they efficient in general or efficiency on issues concerning risk in project.

Risk identification and preventive techniques according to the study can easily be ascertained. Risk identification determines what might happen that could affect the objectives of the project, and how those things might happen. The risk identification process can be comprehensive, as risks that have not been identified cannot be assessed, and their emergence at a later time may threaten the success of the project and cause unpleasant surprises.

Conclusion

Some projects appear to have a passive and ad hoc approach to the management of risk, without the benefits of either tracking the root causes of identified risks or making proactive decisions and actions to mitigate the risks. In a passive and ad hoc approach, risks may be identified but they are largely ignored in the planning and execution process until undesired events occur, at which time solutions are sought. Thus the study investigated into the management of risk at ECG, to ascertain whether projects undertaken by ECG involved risk. The study also investigated the question as to whether risk can be ignored entirely.

Objectives set in the study were all addressed; numerous findings were arrived at, indicating that even though ECG had a qualified and competent Project Team, they were not given continuous training to equip them to be effective and efficient. Furthermore lack of funding was a major challenge that the Project Team faced in executing projects.

The process of identifying the possible risk areas is the primary and considered as the most important as well as most painstaking step in the overall management of the risk. This is due to the fact that all of the entities as well as other aspects that are connected to the industry as well as to the business must be considered in order to know the different risk or threat that can be faced by the company in implementing any projects. The process of identifying the possible risk areas for every project of the company is important due to the fact that the business proper of the company focuses on gas distribution and the likes. Furthermore, any wrong move or failure of one specific project can greatly affect the physical and environmental condition of each and every individual as well as the economic condition of its overall market.

In conclusion, ensuring that adequate and timely risk identification is performed is the responsibility of the Project Manager, as the PM is the first participant in the project. The sooner risks are identified, the sooner plans can be made to mitigate or manage them. Assigning the risk identification process to a contractor or an individual member of the project staff is rarely successful and may be considered a way to achieve the appearance of risk identification without actually doing it. It therefore important, however, that all project management personnel receive specific training in risk management methodology. This training should cover not only risk analysis techniques but also the managerial skills needed to interpret risk assessments.

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