

Strategic and Operational Risk Management

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Lecture 9

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التعاوني ويقدم العلم مقابل العمل للتنمية وبناء المجتمعات.

PMG 630
treatment of risk



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In the fourth and final step—implementation of the action plan—usually falls under the purview of the party responsible for the overall plan, for example, safety officer.

How can the plan be improved? Since this is a long-term responsibility, part the implementation is the continuous improvement of the plan.



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IMPLEMENTATION OF THE ACTION PLAN

Based on experience of which part of the plan works and which do not, based on changes internal to the system, for example, new product line and realization of new target risk events, as well as changes external to the system, for example, evolving detection and control technologies, new insurance products and services, and legal and regulatory changes.



What are the residual and emerging risks? We need to recognize that there will be no plan that can totally eliminate the target risk events, rather the plan simply reduces their likelihood or consequence to acceptable levels—these are termed as residual risks.



But due to the dynamic nature of systems, these levels need to be continually monitored and the plan must be periodically revised to keep the residual risks within acceptable level. This monitoring and periodic evaluation of the plan also enables the identification of emerging risk events—those that may have not been previously identified, or that were identified but were not deemed worth any treatment.



An important aspect of risk treatment is the recognition that there will be more risk events than there are resources to treat them all. Even for those risk events that are subjected to treatment, there will always be some residual risks, albeit at acceptable levels. Hence, part of the bigger picture of operational RM is the realization that it is only practical to expect some degree of risks that will have to be retained and accepted even after treatment.



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Systems Perspective On treating Risks

In Chapter 1, the importance of systems approach to managing operational risks was discussed. Here are some important notes on risk treatment based on the recognition that systems are collections of interrelated elements contributing toward a common goal and the environment wherein these systems are parts of.



Table 4.1 provides an illustrative example of a causal chain of events leading to a particular target risk event. Even in a fairly simple real scenario, causal events may not be linear, there could be multiple ways for the target risk to occur, and some of these causes may not be easily evident.



Table 4.1. Example of the causal chain of events leading to injury and equipment damage and disruption in operation in an industrial facility due to fire

1. In an industrial facility, two boilers are turned on to produce hot water needed for cleaning equipment at the start of daily operation.
2. Leftover packaging materials were left stacked near one of the boiler near an exit door the prior night. These should have been placed into a recycling bin very early in the morning, but for some reason, this was not the case for this particular day.
3. The stack of leftover packaging materials tipped over and some of the materials landed very close to the boiler's heating element
4. Material near the heating element ignited
5. Fire spread to the entire stack of leftover packaging materials
6. Smoke accumulates in the enclosed space where the two boilers are located
7. Any person within this enclosed space may suffer from severe smoke inhalation or burn
8. The boilers themselves may catch fire or the smoke might damage them, particularly the external components that are made of plastics, rubber, and glass making both boilers inoperable
9. Fire may spread to other combustible materials nearby such as boxes of recent delivery receipts and inventory of packaging materials
10. Fire may spread to outside the enclosed space where the boilers are located and further damage more equipment and possibly result in more injuries

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SYNERGISTIC EFFECTS OF RISK TREATMENT STRATEGIES:

Aside from reducing the target risks, the same set of mitigation strategies may also have the synergistic benefit of reducing other none-targeted risks whether intentional or not. As an example from segment 2 from Table 4.1, keeping floor space near the boiler free from any material may help pre-vent fire and may also prevent accidents as personnel try to use the exit door near that area.



In contrast to having a synergistic effect, some risk treatment strategies may result in increasing other events than the target risk events. As an example from segment 9 from Table 4.1, having duplication of receipts in electronic format may also create risks of confidential data pilferage due to cyber hacking.



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RATIONALIZING COST OF TREATMENT

Similar to the traditional cost estimation and investment accounting, the cost of implementing risk treatment plans needs to be rationalized ترشيد by comparing the benefits and the costs. However, risk events are inherently uncertain and do not lend themselves to the traditional benefit–cost analysis. Thomson approach is to classify the various cost of the strategies based on (a) cost of prevention meant to reduce the chances of occurrence of risk event, (b) cost of reducing the consequence if the risk event occurs, and (c) the residual consequences of the risk event.



A well-rationalized risk treatment plan would be one in which the benefit of avoiding some of the direct consequences of risk events are more than the sum of the cost of prevention and the cost of reduction in the consequence if the risk events occur.

However, estimating these benefits to allow comparison with the costs can be challenging.



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BENEFITS OF RISK AVOIDANCE

As an example, the traditional cost analysis may estimate cost in terms of monetary unit, while the treatment of system safety risk events may have the benefits of avoided injuries or lives saved.



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ECONOMICS OF RISK TRANSFERS

Why would someone assume the risk you are not willing to assume your-self? The underlying assumption in transferring risk is that another system, for example, insurance companies (also known as the insurer) will be willing to assume some if not all the financial burden resulting from a particular risk event in return for a predetermined amount of money such as insurance premiums from the original risk holder (the insured).



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ECONOMICS OF RISK TRANSFERS

To put it simply, this transfer of risk will happen if the insurer has the ability to pool or bring together enough of this money from many insured such that the expected payout if the risk event occurs is significantly less than the sum of the collected insurance premiums. This pooling of risks enables the insurer to operate at a profit and still satisfy its obligation for payouts to the insured.



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ECONOMICS OF RISK TRANSFERS

This is common for risk events with high consequences but low chance of occurrence. Common examples of such insurable risks are health insurance and drivers' accident insurance in which there is enough number of those willing to pay the premium and the chance that everyone will need a payout all at the same time is very low. From a systems perspective, this highlights the wide range of environments in which the insured systems are operating.



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Risk monitoring

After identifying and assessing the risk and selecting risk treatment response plans, the next important function is risk monitoring, reporting, and review, as shown in Figure 5.1. Here the purpose is to monitor the implementation of the risk response plans and actions and evaluate the effectiveness of the current risk management processes. A key part of this function is assessing how the present risk management plans and processes can be improved to respond to the current and emerging environments.



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1. To determine whether the particular operational risks (and their causal chain of events) are under control or not. This includes tracking identified risks and checking that significant risks remain within acceptable risk levels.
2. To assess the effectiveness of the risk treatment, response plans, and actions in addressing the identified risks. This includes gaining relevant information during the monitoring and review process to further assess, control, and eliminate critical risk events.



3. To evaluate the robustness متمانه of risk controls over time as the system evolves. This also includes monitoring residual risks, identifying gaps and new risks.
4. To keep track of the evolving needs الاحتياجات المتطورة and requirements of the systems.

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Risk monitoring

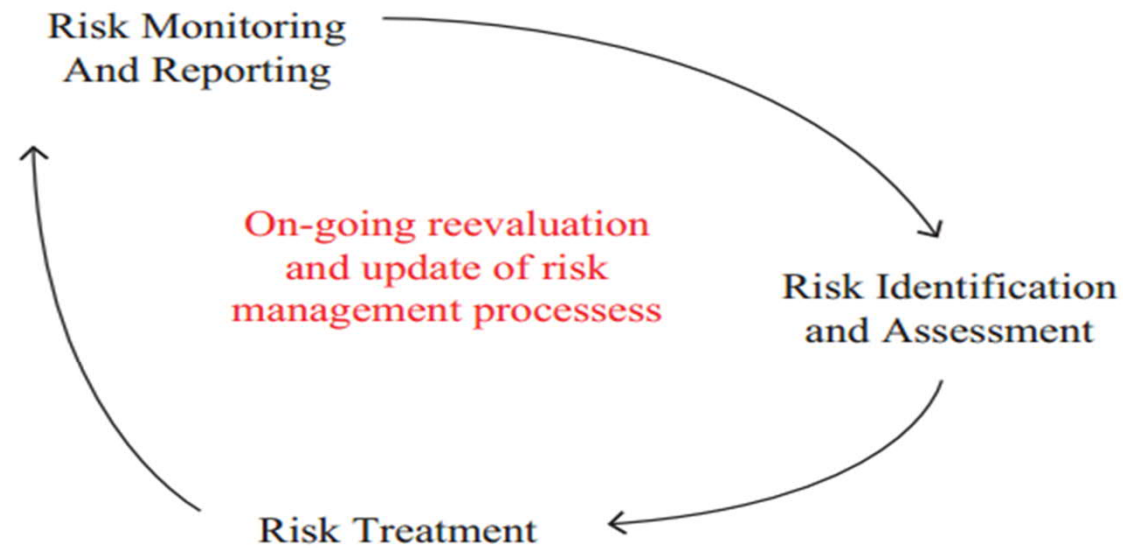


Figure 5.1. Risk management functions.



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Risk monitoring

Monitoring and management of risks is one of the main elements in the risk treatment and risk management process. There is no one specific methodology or process that can be applied to monitor operational risks in all systems. For example, monitoring operational risks in a bank is different from monitoring operational risks in a production system.



- Performance monitoring requires both an understanding of the context of the risk event and the methodology used for the performance monitoring as well as an appreciation of the uniqueness of the operational risk of the system.



- For a reliable monitoring process, comprehensive treatment and assessment of risk events are necessary. It is essential to have a clear set of definitions of the operational risk under monitor. This includes identifying the appropriate risk indicators.



- The development of flexible methodology to accommodate any adjustment or changes in the system. It is naive ^{ساذج} to consider that the operation environment is always static, and therefore, operational risk can be controlled or avoided in the systems all at once.

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Risk monitoring

- Full appreciation of the surrounding environments where systems operate. It is essential to understand the nature of the operations' environment. In the static environment, the system is bounded apart from the environment, which means that there is no or minimal interaction between the system and the environment.



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Risk monitoring

In the dynamic environment, there is continuous interaction between the system and the environment. While it is relatively easy to monitor the operational risk in a static environment, it is a much more difficult task in a turbulent shifting environment.



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The Baseline: Risk Management Plan

The culmination تتويج of the risk processes discussed in Chapters 1 to 4 is a document often called the risk management plan. This report typically becomes the baseline for any risk monitoring process. In general, the report should include the following parts.



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The Baseline: Risk Management Plan

1. Description of the scope of the risk management plan (refer to Chapter 2)
2. Risk identification and assessment (refer to Chapter 3)
3. Risk treatment, response, and action plan (refer to Chapter 4)



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The Baseline: Risk Management Plan

The risk management plan is essentially a compilation of the broader system's risk profile or risk portfolio. Note that the report should cover the 6 + 1 questions (Table 2.1) as discussed in Chapter 2. It defines the scope of the risks being tracked and quantifies or measures the risks in terms of their estimated likelihood and impacts.



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The Baseline: Risk Management Plan

It should further describe established acceptable risk level (i.e., As Low as Reasonably Practicable [ALARP] from Chapter 3) and detail the treatment response plans and actions for each identified risks. Included in the plan are the processes established for detecting, tracking, and documenting risks, as well as persons responsible for each risk response and actions.



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Tracking: Risk Database

The most common database compiled for risk is what is known as the risk register or risk log. The database and information requirements are extracted from the risk management plan. It often replicates or digitizes the tabular forms in Chapter 3. Though, more importantly, the risk register tracks the actual occurrences of the risk events.



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Tracking: Risk Database

Further, the risk register can document conditions leading up to the risk event, the response and actions taken, as well as the actual outcomes. The specifics are often included in an incident report. An incident report or accident report is a form that is filled out in order to record the details of the risk event.



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Tracking: Risk Database

Other types of risks such as cost risk, schedule risk, programmatic risk, and technical risk have certain indicators that may be used to monitor status for signs of risk. Tracking the progress of key system parameters can be an indicator of risk or key risk indicator (KRI).



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Tracking: Risk Database

The risk register when translated into a digital database or information architecture offers several enhanced functions. A database can handle the recording and compilation of detailed historical risk information. Also, a database can enable automated tracking and signaling. It can be used to identify risks that are within acceptable levels, risks that are out of control, and risks that are trending toward out of control. These KRIs can be captured and stored as digital data to be used for future planning and decision making.



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Tracking: Risk Database

Further, the risk database should track the implementation of treatment and response plans, plans that are implemented, plans that are not implemented or partially implemented (including schedules and milestones), as well as their costs and effectiveness in addressing the risks (including any instances of over controlled risks). Figure 5.2 shows a screenshot example of a simple risk database.



Risk Database		
ID		
Project	Name	
	Number	
Risk	Number	
	Source	
	Category	
	Probability	
	Impact	
	Other factors	
Risk Management Plan	Number	
	Description	

Resources:

Operational Risk Management

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Chapter 4