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RISK MANAGEMENT LESSONS LEARNED

DISPUTE RESOLUTION

ABSTRACT.
Many organizations have implemented formal risk management practices at either the individual project level or as a part of management of an overall capital program. However, often those organizations are not seeing the anticipated benefit from implementing those practices. They continue to have projects fail by going significantly over budget, experiencing pronounced delays, or suffering major disputes between parties. Having reviewed a large number of projects in these programs over the past twenty years, the author has identified many lessons learned that have impacted the value an organization receives from implementing risk management. The lessons learned cover all facets of a risk management program, including risk management planning, identification, qualitative and quantitative assessments, response, and monitoring. The issues include mistakes in implementation, tool utilization, poor understanding, lack of collaboration, and lack of commitment. The author has witnessed issues in each of these areas that reduce the effectiveness of the risk management program. By highlighting these issues and how to address them, other organizations can benefit from these lessons learned and maximize the value of a strong risk management program.

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INTRODUCTION

Risk management (RM) has been identified by multiple industry associations, including AACE International, as an important component of project management. Many organizations have implemented formal risk management practices at either the individual project level or as a part of management of an overall capital program to help improve project/ program performance. Yet often those organizations are not seeing the anticipated benefit from implementing those practices. They continue to have projects fail by going significantly over budget, experiencing pronounced delays, or suffering major disputes between parties. Understanding the issues that have hampered the organizations from realizing the planned benefits is important for other organizations to not suffer the same failures.

The author has reviewed projects over the past 30+ years across multiple industries, including many that have attempted to incorporate risk management into its practices. The author has identified lessons learned that impacted the value an organization receives from implementing risk management. These lessons cover all facets of an RM program, including initial planning, risk identification, qualitative and quantitative assessments, response, and monitoring. The author has witnessed issues that include mistakes in implementation, tool utilization, poor understanding, lack of collaboration, and lack of commitment. By highlighting these issues and how to address them, other organizations can benefit from these lessons learned and maximize the value of a strong RM program.

RISK MANAGEMENT OVERVIEW

AACE's Total Cost Management Framework Section 7.6 discusses the importance of risk management to the success of projects and programs and details the elements of a robust RM program. [1] Each of the elements plays an important role in controlling risks on a project. Each one can represent a point of failure if not implemented well. If any element is not properly addressed or supported, the benefits of risk management will be degraded. Figure 1 is the TCM Process Map for Risk Management, reflecting the various elements, their interconnection, and their connection to other project control elements. [2]

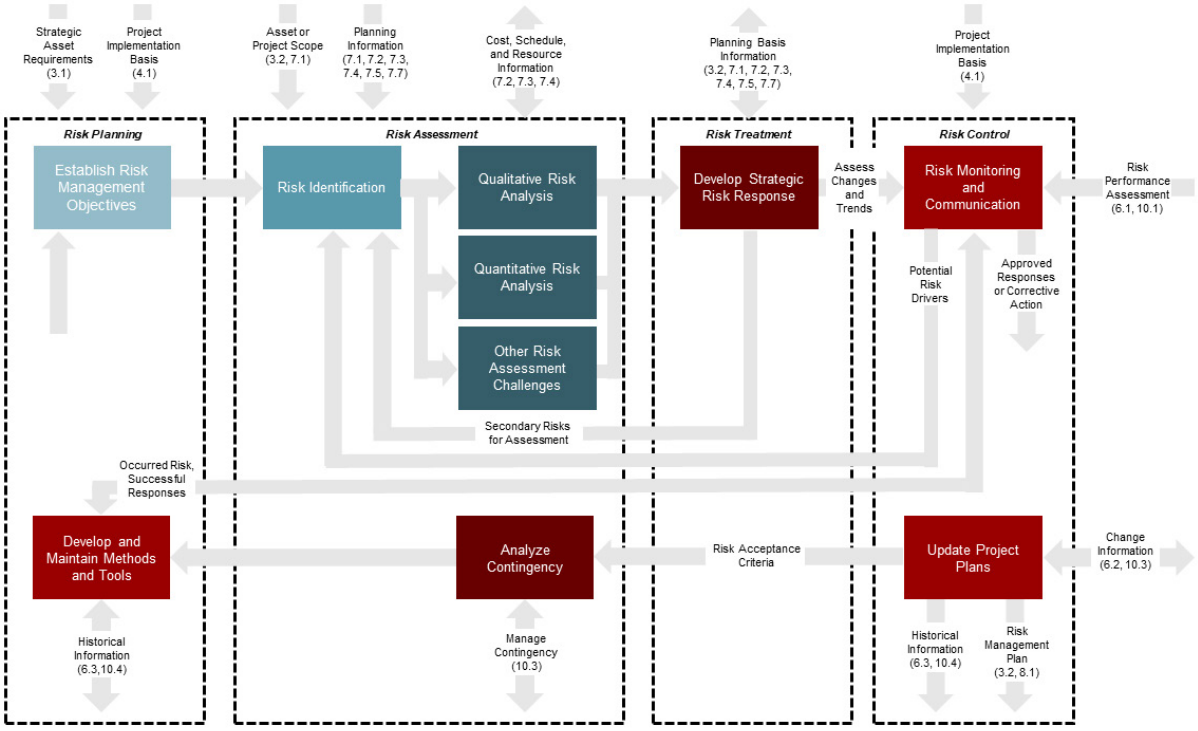

Figure 1 – AACE International Total Cost Management Framework Figure 7.6-1 Process Map for Risk Management

The lessons learned in this paper are grouped according to the key steps within each element of AACE's risk management process.

RISK MANAGEMENT PLANNING

Primary Purpose – How to Effectively Control the Risks That May Impact Your Project

Many construction project professionals are familiar with a project execution plan (PEP) that details how a project will be developed and executed in the various phases of the project across various components including design, procurement, contracts, planning and scheduling, cost control, financial, and other elements. The purpose is to ensure all project team members understand how they are supposed to work together to successfully execute the project. Like a PEP, an RM Plan is needed to align everyone on how risks will be controlled throughout the life of a project. It should establish a basic framework for the following aspects of risk management:

+ Roles and responsibilities – Who is responsible for each aspect of risk management, what internal and external resources will be used, and what they will be responsible for in each stage;
+ Contributors – Who are the stakeholders that need to be involved in risk management, including identification, assessment, and responses;
+ Risk Identification – When will risks be identified in formal workshops, how will the risks be updated, what tools need to be utilized;
+ Risk Assessment – How will risks be assessed, what quantitative and qualitative tools will be used, when will they be conducted;
+ Response Actions – How will risks be prioritized for response actions, how will risk owners be identified, how will potential response actions be evaluated;
+ Updates – How often will the team meet to monitor the status of risks including identification of new risks, effectiveness of response actions, and current priorities; and
+ Communication – How will risk management plans, status, and impacts be communicated to the project team and others on a regular basis to inform management decisions.

LESSONS LEARNED

Not a "Check the Box" Exercise – The author has seen multiple projects treat this step as a "check the box" exercise, including taking a previous RM plan and just changing the project name and people's names. They are not putting focused thought into how risks should be managed on that specific project. The result is that what is intended to be an effective management tool is often just filed away and rarely viewed.

Need a "Risk Manager" – Often a formal risk manager is not named on the project or roles and responsibilities are not updated to specifically include the tasks required for formal risk management. Frequently the project manager or project controls manager is expected to manage risks as a part of their day-to-day activities. While these individuals may be the right person to serve as the risk manager, without that formal title, they tend to just focus on their primary responsibilities and the risk management responsibilities do not receive the attention needed to be effective.

Not a "Check the Box" Exercise

Need a "Risk Manager"

Not Just Part of Project Management

Risk Management is Not Just at the Beginning of a Project

Not Just Part of Project Management – While risk management is an important aspect of project management, it does require discrete activities to give it the attention it deserves. An effective RM program requires focusing on the identified risks and response actions. Instituting formal activities for risk management will help keep it at the forefront

and be more effective in addressing the project risks.

Risk Management is Not Only at the Beginning of a Project – Effective risk management requires dedication throughout the entire lifecycle of a project, not just during the front-end of the project. Just like New Year's resolutions that are often quickly forgotten, risk management often receives a significant amount of attention at the beginning of a project but is not effectively implemented throughout the life of the project. RM plans will spend a lot of time on how the risks will be identified, assessed, along with response planning, but the plans lack the specificity on how the responses will be managed, monitored, and communicated. The author has reviewed a number of projects in the middle of construction only to be provided a risk register that has not been updated since the project received formal approval. No plans were developed for how the project would manage the risks through the execution phase. As a result, the risks were largely not managed. The effort must be comprehensive and effectively applied in all phases of the project to create the expected value.

RISK IDENTIFICATION

Primary Purpose – Understanding What Risks May Impact Your Project

The risk Identification element is intended to help the project team and stakeholders understand on a common basis what risks may impact the project. The best methods for identification of these risks involve group workshops that incorporate the input of a broad range of expertise and knowledge about the project. Gathering the inputs from all parties involved on the project and ensuring that everyone's input is considered helps provide a comprehensive list of risks that need to be assessed and addressed. The exercise also needs to comprehensively identify all types of risks, including not just risks, but also opportunities, and elements of uncertainty that need to be addressed.

While the initial workshop is typically the most important, a risk identification exercise should be repeated at key junctions on the project, such as the start of each new phase, to ensure all risks associated with the upcoming phase of work have been identified.

LESSONS LEARNED

Teams often fail to identify a broad range of risks – In conducting risk workshops and in reviewing risk registers that were developed by others, the author has encountered very narrow thinking by the groups in identifying risks on projects. If not corrected, these teams will focus their attention on a limited number of risks and fail to address other common or systemic risks that were not identified in the exercise. The participants in risk identification exercises often need to be challenged to think beyond the risks they are immediately dealing with, such as technical risks or permitting. The risk workshop facilitator needs to be capable and ready to provide this challenge and push the participants to think beyond what they immediately see by listing risks from other projects to determine if they apply to this project. Risk checklists can also help to identify risks by listing risks across a broad range of sources and project phases.

Project managers may want to limit involvement – To help make risk identification workshops more efficient or to make it easier to coordinate schedules, project managers may want to exclude some stakeholders from participating. The author has encountered PMs that did not want to include the contractors,

Teams often fail to identify a broad range of risks

Project managers may want to limit involvement

Systemic risks are often missed

Risk identification is often never repeated

We keep threats as risks but incorporate opportunities

joint venture partners, customers, or other stakeholders for various reasons. While the reasons may be legitimate, the result is a limitation in identifying project risks. In those instances, alternative means may need to be used to ensure that all stakeholders have an opportunity to contribute to the risk identification exercise. Without that comprehensive effort, the risk management effort will be limited by not addressing all the project risks.

Systemic risks are often missed – Risk identification exercises can often fail to identify systemic risks that can profoundly impact a project. Simple issues such as an organization's decision-making process, software tools, and communications can be overlooked in the identification exercise. The author has reviewed multiple projects impacted by organizations taking a significant amount of time to decide on how to proceed on a project, failure to identify issues due to its limited data collection, or not having a strong communication process when addressing changes or other information needs. The risk identification workshops need to spend time focusing specifically on these types of issues to ensure any risks associated with them are captured.

Risk Identification is often never repeated – The initial risk workshop held during project development can often be the only risk identification exercise ever held. But projects are dynamic efforts conducted in a dynamic world. The markets and environments affecting a project will change over time and the projects will also change as new information becomes available and plans change. As a result, new risks will emerge that need to be identified and managed. The author has reviewed a number of projects that were impacted by events that were not identified as risks early in the project but may have been if the identification exercise had been repeated later. As a result, the project team missed the opportunity to be able to respond to the risk and potentially mitigate or avoid the impact when it occurred.

We keep Threats as Risks but incorporate Opportunities – Whether it is a bias towards optimism or something else, project teams often have a tendency to build opportunities into the plan, working under the premise they will occur, or they can take steps to cause them to occur, while they keep threats listed as risks and do not incorporate them into project plans. The result is that the project plans are often overly optimistic with unrealistic budgets and schedules. Teams need to treat opportunities the same way they treat threats and not incorporate them into the plan until the response actions have increased the probability sufficiently to justify that approach.

RISK ASSESSMENT – QUALITATIVE

Primary Purpose – Prioritizing Risks and Response Actions

The qualitative assessment of the project risks helps project teams determine which risks are more likely to affect the project. This is based on the likelihood of occurrence and the potential impact it could have on the project if it does occur. The best-recommended practice for this type of assessment is to use a 5-point scale for probability and impacts. Figure 2 shows an example of what these scales may look like on a project regarding the probability of a risk occurring, and the potential cost and schedule impacts it may have on the project targets.

GENERAL RATING	PROBABILITY	COST	SCHEDULE
Very Low	<10%	<0.1% Total Project Cost	Minor Non-Critical Impact
Low	10% - 20%	0.1% - 1% Total Project Cost	Major Non-Critical Impact
Medium	20% - 40%	1% - 2% Total Project Cost	<1 Week Overall Impact
High	40% - 60%	2% - 5% Total Project Cost	1 Week - 1 Month Overall Impact
Very High	>60%	>5% Total Project Cost	>1 Month Overall Impact

The purpose of this exercise is to help the project team prioritize the risks on the project and to develop response

actions that are appropriate based on the assessment of the risk. Higher probability risks with higher impacts should receive the most attention with lower probability risks with lower impacts receiving the least effort.

LESSONS LEARNED

Baseless optimism is all too common when assessing risks – There is a common tendency in project team members to be unrealistically optimistic when assessing project risks. This may be due to a bias based on their knowledge of the project and the perception that they understand the project and have a good handle on the risks that could occur. This can result in risks being underassessed and not receiving the priority it should. Risks related to labor productivity is one area in particular where this occurs. The external expert or facilitator needs to help teams address this bias and remove it from the assessment of each risk. Understating a risk's probability or impact will only increase the overall project risk of impacts due to an understated response action. There is a higher likelihood that a team may decide to "accept" a risk rather than implement a response action if the risk is deemed a sufficiently low priority.

Baseless optimism is all too common when assessing risks

The exercise is only helpful if people are honest in their assignments

The exercise is only helpful if people are honest in their assessments – Some individuals may knowingly misrepresent the probability or impact of a risk to help drive a specific outcome, either to overstate or understand a risk, typically understate. Though not common, the author has seen individuals appear to misrepresent a risk, most often when the risk directly relates to their area of responsibility. It can help support getting additional resources to manage activities related to that effort or divert attention away from that area. The facilitator needs to be aware of this potential and try to get additional input from other project participants when it appears that the assessment of that risk is being misrepresented.

RISK ASSESSMENT - QUANTITATIVE

Primary Purpose – Understanding the Potential Impacts to Project Cost and Schedule Targets

The primary purpose of the quantitative risk assessment on a project is to assess how all the various risks may impact the overall project cost and schedule targets. Typically, this exercise is performed by building a probabilistic model of the project costs and schedule and modelling how each risk may influence the project costs and schedule duration. Using the model, a simulation is performed using a Monte Carlo analysis with thousands of iterations to develop probability curves of cost and schedule outcomes. The model is typically created in specialized software intended for this purpose.

The results of the model simulation can help management understand the potential variability in those outcomes versus the targets that have been set. The results can also be used to help set contingency levels depending on the level of confidence the organization wants to have in achieving or improving upon the established outcome.

LESSONS LEARNED

Quantitative Assessment requires expertise in the exercise and software to be effective – Development of the probabilistic model(s) for quantitative assessment requires a combination of art and science and should not be performed by a novice with little or no experience in this type of assessment. There is more than one right way to construct a model, but there are many more wrong ways. The author has seen the results of quantitative risk assessments where the project team conducted the exercise without any knowledgeable facilitators supporting them. The results are typically flawed in multiple ways. The models may not be developed appropriately, may not include all appropriate scope or activities, and may significantly misrepresent how the risks may influence the project cost and

schedule. Correlations between risks are almost always missed entirely. The result is often a significant understatement of the project cost and schedule variability and can drive the wrong decisions or behavior.

The project team should provide input to the model – While a general recommendation is for an expert to lead this exercise and develop the probabilistic model(s), the project team still has a role to play in developing the model. The author has typically developed the model(s) based on the project's deterministic cost and schedule details and interviews with the project teams. However, the draft model is then reviewed with the project team to ensure it accurately reflects the project execution plans and the risks that may influence the outcomes. Inevitably, the project team will identify an issue with the model construction or in how the risks were reflected in it. However, the expert needs to have the final say in the model development, particularly if they have been asked to provide an independent assessment of the project.

Quantitative Assessment requires expertise in the exercise and software to be effective

The project team should provide input to the model

The model(s) should not be made to fit some desired or pre-determined outcome

The model(s) should not be made to fit some desired or pre-determined outcome – Typically a quantitative assessment is performed in conjunction with a current estimate and project approval stage. The estimate and stage gate may indicate that the cost and/or schedule variability may be at a certain level, for example +/-10%. This information often drives project teams and maybe even the facilitator to develop a model that produces a simulation result that indicates that level of variability. Once the simulation is performed, if the results indicate wider variability, the expert or project team may adjust the model to help produce that expected variability. While the model and results should certainly be reviewed to ensure no errors in the model construction or risk representations, the model should not be adjusted to adjust the results to fit within the range typically expected for that stage in project development.

RISK RESPONSE

Primary Purpose – Addressing the risks to improve project performance

The purpose of the risk response step is to develop and implement risk response plans to address the identified risks on the project. The goal is to reduce the overall number of risks that impact the project and reduce the impact they may have. A response strategy needs to be developed for each risk, even if the strategy is just to "accept" the risk. A risk owner needs to be assigned to each risk that will be responsible for coordinating the risk response actions and assessing the residual risk as the actions are implemented. The response plans should include specific actions to be taken, need-by dates, and responsibilities for who will do what.

Another important aspect in the development of the risk response plans is to evaluate the cost and schedule impacts of the risk response actions versus the expected value in mitigating the risk. If the cost of the response is greater than the expected value of the risk, it may not be appropriate to implement that response.

LESSONS LEARNED

Risk response plans are developed and often not implemented – One of the biggest issues identified in implementing risk management on projects is that teams will develop risk response plans but fail to follow through with the implementation. This failure occurs due to many of the issues identified in this paper, such as failure to name a risk manager, too little focus on risk management after the front-end development, or inadequate assessment. Another common parallel is that project teams will develop pre-mitigation risk assessments and then develop post-

mitigation assessments based on how effective they expect the risk response plans to be. If the assessment of the post-mitigation state is sufficient, then teams will consider that a success, forgetting that the risk response plan still needs to be implemented.

It takes a village to manage risks – Too often the project team tries to manage the project risks within the team. However, many risks can be better managed by stakeholders outside the project. All stakeholders have a role to play in addressing project risks and coordinating with them to implement specific response plans. This can reduce the workload on project team members, as well as be more effective in controlling risks.

Risk response plans need to be specific – Too often risk response plans are vague without the necessary detail to be actionable and tracked. Some plans may state to "Rework schedule to avoid work in area X during period Y" without determining what can be specifically modified to make that possible. While the initial high-level plan may state something like that, it needs to be better defined to determine who will do what and when so then it can be implemented. The author has seen these types of vague response plans either not be implemented or only limited effort made because it was not better defined.

Risk response plans are developed and often not implemented

It takes a village to manage risks

Risk response plans need to be specific

The cost and effort required for risk response plans can be undervalued

The cost and effort required for risk response plans can be undervalued – Sometimes it can be challenging to properly assess the cost, resources, or time required to implement risk response actions. An inadequate assessment of the effort required to implement a response plan can result in it being started too late or the effort was not adequately supported to be effective. The other issue can be that if the true cost of a risk response plan was known, it would not be considered cost effective as the price to implement the solution was worse than the risk it addressed. The evaluation of the cost and resources required for a risk response plan should be taken very seriously and draw on multiple resources to ensure it is properly evaluated.

RISK MANAGEMENT MONITORING

Primary Purpose – How Are We Doing?

Monitoring the RM program serves the same purpose as cost and schedule updates during the project execution. How are we doing? How much progress have we made? How effective have our efforts to date been? What direction are we going in? What are the key areas we need to focus on in the coming period?

A project should be issuing regular risk management reports. It helps keep the effort active and in the forefront of everyone's attention. It should identify what risks have been resolved, indicate the current risk profile, alert to near-term actions needed, identify emerging risks, and update everyone on contingency usage and balance.

Regular risk management meetings should also be held to discuss risks and the program. Risk owners need to be able to advise on the progress of risk response plans for which they are responsible and any adjustments that may be needed. New risks can be discussed as a group. Risk assessments can be updated as needed.

LESSONS LEARNED

Monitoring is the forgotten step – Too often projects that implement an RM program fail to have any type of effective risk management monitoring during the project execution. As a result, very few individuals are aware of the

status of project risks, risk response plans, and contingency usage. Without the meetings and reports, accountability is forgotten, and the priority of risk response efforts falls. In instances where it has been implemented, risk discussions are more common, and all team members are more aware of what risks may impact the project in the future.

Monitoring is the forgotten step

Risk Management reporting is often incorporated into project controls reporting

Risk Management reporting is often incorporated into project controls reporting – While incorporating risk reporting into project controls reporting would seem understandable, it does lessen the focus on risk management. Contingency management is often an important element of project controls reporting, but the underlying risks that impact the contingency usage and the response plans associated with those risks are often not included in the project controls reporting or relegated to an appendix. Accountability is often not included in these reports. The result is that the effort loses focus and the attention of the project team members and risk owners.

OTHER KEY LESSONS LEARNED

In addition to the lessons learned associated with each of the risk management elements, a few other key lessons learned have been identified.

Effective risk management needs to be embraced by senior management – The author has seen RM programs languish due to the lack of support from senior management at a company or in the projects group. While they may have championed risk management when it was implemented, it needs continued support to provide the expected benefit. Without that continued support, project teams will often no longer see it as a priority for the organization and not what they should be spending their time on. Even if a project manager is not a strong risk management advocate, if the senior management is focused on it, the project manager will take the steps to implement it on the project and ensure it follows the organizations guidelines.

Effective project risk management can benefit future projects – In organizations where project risk management is effectively implemented, it typically benefits future projects through the data and lessons learned it provides. The risk register from an earlier project can serve as a checklist for future projects to help in risk identification. The effectiveness of risk response actions can be used as a guide on future projects in developing their risk response plans. The author has seen past project risk registers and results used as input for new projects. Over time this institutional knowledge can increase the effectiveness of the RM program.

Risk Management can provide value regardless of an organization's size or capital projects - Many organizations do not think they are large enough to need formal risk management, but it can benefit projects and capital programs of all sizes. It is important to calibrate the program according to the size of the project or program. For small projects, it may just involve the project team conducting the risk management steps around the conference room table. It provides a structure for a team to focus specifically on the risks that may impact the project, assess those risks to prioritize which need specific response plans, and then track those actions to see if they are effective.

CONCLUSIONS

Most of the lessons learned identified in this paper reinforce practices that are identified in AACE's TCM, recommended practices, and papers that have been previously published. The author's experience over the years has proven why these practices need to be followed by an organization. By following these practices, an organization can achieve the expected benefits of a robust RM program, both at the project level and throughout its capital project.

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