RISK.2130

An Introduction to 77R-15: Quality Control/Quality Assurance for Risk Management

David C. Brady, P.Eng. DRMP and Dr. Alexia A. Nalewaik

Abstract— Have you ever had senior management ask questions similar to: How do I know our risk program is working? Is it improving? How have you answered?

The new Recommend Practice 77R-15 is guided by the view of quality improvement as documented in TCM Section 11.4:

> *In Jurans view, planning and quality management must be guided by a breakthrough way of thinking. Quality improvement should emphasize not just traditional continuous improvement, but also breakthrough changes, which are a dynamic, decisive movement to new, higher levels of performance.*

This presentation is a synopsis of how risk management QA/QC is this type of breakthrough thinking. 77R-15 can be used on your project or program, regardless of the size and complexity, by providing QA/QC ideas to allow you to develop your own risk QA/QC program.

Ideally, the risk management processes provide opportunities for all stakeholders and contracting parties to work together and manage risk (i.e. threats or opportunities) in a way that increases the probability of success of the program or project. 77R-15 is one of those processes.

AACE® International Recommended Practice No. 77R-15

QUALITY ASSURANCE/QUALITY CONTROL FOR RISK MANAGEMENT

TCM Framework: 7.6 – Risk Management

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Note: As AACE International Recommended Practices evolve over time, please refer to www.aacei.org for the latest revisions.

Contributors:

Disclaimer: The opinions expressed by the authors and contributors to this recommended practice are their own and do not necessarily reflect those of their employers, unless otherwise stated.

David C. Brady, P.Eng. DRMP (Author)
John K. Hollmann, PE CCP CEP DRMP (Author)
Dr. Alexia A. Nalewaik (Author)
James E. Arrow, DRMP

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INTRODUCTION

SCOPE

This recommended practice (RP) of AACE International shall define the expectations, requirements, and practices for developing a risk management (RM) quality program. This RP will identify the quality assurance (QA) process, quality control (QC) process, and related risk management auditing methods for a capital asset portfolio, program or project management organization. The RP expands on TCM[2] sections 11.4, *Quality and Quality Management* and 11.5, *Value Management and Value Improving Practices (VIPs)* as applicable to the *Risk Management* process as described in TCM section 7.6. It includes practices for planning how to develop and implement a quality assurance and quality control platform and a proper auditing program for risk management within a project, a program, or a portfolio. Emphasis will be on a continuous improvement suite of tools aligned with quality management principles applied to the risk management process and considers the cost of quality. This RP is not about governance, risk management and/or compliance for an overall TCM process or management of an enterprise as a whole. It only applies to the risk management process or program within that framework.

The process of risk management interfaces with investment decision making (TCM section 3.3) in consideration of risk prior to initiation of projects, and change management (TCM section 10.3) in which risk cost and time allowances (e.g. contingency and reserves) are assessed and managed during program or project execution. While this RP does not cover those processes per se, the user should ensure that the quality program interfaces appropriately with them.

PURPOSE

This RP is intended to provide guidelines (i.e. not a standard) for developing and using a quality assurance and quality control program applicable to risk management.

This recommend practice is intended to be a model that can be used as a basis for planning quality improvement programs for risk management; to help risk, project, and asset program managers discern whether their risk management program is working; and identify where performance improvements are required. It will provide a foundation for not just addressing the overall risk management QA/QC program but specifically developing QA/QC ideas for risk treatment plans as described in RP 63R-11, *Risk Treatment*[4]. Ideally, the risk management process provides an opportunity for all stakeholders and contracting parties to work together and manage risk (i.e. threats or opportunities) in a way that increases the probability of success of the portfolio, program or project. The implementation of all or part of this RP will depend on the size and complexity of the program or project but the basic processes described should be used in all cases.

BACKGROUND

The Sarbanes-Oxley (SOX) Act of 2002 in the United States, and similar laws in other countries, resulted in a significant increase in financial governance required of public companies. These regulations focus on the accuracy and completeness of financial reporting. This directly affects the TCM process which is largely focused on improving the financial success of capital investment portfolios, programs and projects (among other measures of success). To the extent that uncertainty (i.e. risk) in capital asset and project management affects the accuracy of company financial reporting, risk management's performance and hence governance is crucial. Return-on-capital

and similar metrics are key performance metrics for most public companies and governments have similar goals to optimize the value obtained from investment of company or government revenues.

The starting point for a risk management quality process is to understand and implement a TCM process upon which it will be applied. As stated in TCM 11.4.1:

> *"There are many definitions and perceptions of what quality and quality management are. In simple terms, quality in TCM is conformance of an asset (product, service, process, etc.) with requirements and expectations. Quality management is what an enterprise does to ensure that its assets meet these requirements and expectations. In TCM, quality management is not a separate process; TCM, including strategic asset management and project control, are quality processes. The TCM processes, as discussed in Section 2.1.2, are based on the plan, do, check, act (PDCA) model; this model is a time honored quality management approach sometimes called the Deming or Shewhart cycle."*

TCM is aligned with the International Organization of Standardization's (ISO) eight principles that guide quality management practice[10]. These principles and how TCM (11.4.1) and this RP address the principles are shown in Table 1:

ISO Principles	**TCM and RP Approach to the Principles**
Customer focus.	TCM and risk management elicit and identify stakeholder risk expectations, requirements, and how they define success in order to determine how the QA/QC program will address them.
Leadership.	TCM and risk management assure that the risk program addresses corporate strategic objectives, the risk management's objectives are communicated, and buy-in and support are obtained.
Involvement of people.	TCM and risk management address stakeholder management, resource management and team development through the use of risk management organization charts, QA/QC RASCI tables, communication matrices and similar tools.
Process approach.	TCM, including its risk management process (7.6), provide a framework for governance that can be used to assure alignment with the company's current quality control/assurance program.
System approach to management.	The TCM and risk management process maps address management as an integrated, quality management system (e.g. integration of risk management and project control, etc.).
Continuous improvement.	TCM and risk management processes include measurement and assessment of performance, benchmarking of processes and practices, corrective actions, and feedback loop to improve future practice and outcomes, i.e. a quality management program.
Factual approach to decision making.	TCM and risk management are predicated on decision analysis that is supported by objective data obtained through performance measurement and empirical data management as appropriate. In consideration of uncertainty where subjectiveness is applied or evident in risk management, it is noted and treated as such (e.g. recognizing bias, uncertainty, etc.).
Mutually beneficial supplier relationships.	TCM and risk management are integrated processes that include suppliers among the stakeholders whose expectations and requirements are addressed.

Table 1 – ISO Quality Management Principles and their Alignment with the TCM Framework

RECOMMENDED PRACTICE

As a guideline, each organization should build upon this RP to develop and manage its own risk management quality program.

Some examples of enterprise quality management initiatives that align with a risk management quality program include:

- Total quality management (TQM)
- Six Sigma
- Stage or phase-gate project systems

In all cases, these are built on a managed integrated processes and systems. The intent of this RP is to focus on the risk management process as defined in section 7.6 of the *TCM Framework* and assuring, auditing and controlling the quality of its four main steps: plan, assess, treat and control. To do this, the RP provides some guideline matrices or checklists that can be used to evaluate the content of a risk program's quality management. In essence, quality is about meeting requirements. Scorecards or similar measurements of the how well those requirements have been met are a necessary element of assuring, auditing and controlling quality.

Per TCM Framework section 7.6, the goal of risk management is to "increase the probability that a planned asset, project or portfolio achieves its objectives." The quality of a risk management program ultimately is defined by how well it meets this goal. Demonstrating that this goal has been achieved is difficult, since the success of an outcome without risk management is unknown. However, one can readily monitor success over time for a portfolio by measuring improvement trends in such things as accuracy in a cost and schedule goal. This is not to confuse accuracy with quality (e.g. the accuracy of an estimate for a risky project will always be less than that for a non-risky project regardless of the quality of the estimating process) but the takeaway is that success of risk management is measurable.

GENERAL REQUIREMENTS OF A RISK MANAGEMENT QUALITY PROGRAM

Key Quality Program Concepts: Assurance, Control and Governance

The following are key concepts and terminology relative to a quality management program for risk management:

- Governance – In the TCM Framework, assuring the alignment of the portfolio, program or project risk management process objectives with the strategy of the overall enterprise. To paraphrase one author, it is the rules, laws and processes to guide the successful management of a portfolio, program or project.

- Quality – Conformance to established requirements (not a degree of goodness). (10S-90[1])
  - Quality is the characteristics of a product that allow it to meet the expectations of the project.
  - Quality is all about fulfilling requirements.

- Quality control – Inspection, test, evaluation or other necessary action to verify that a product, process, or service conforms to established requirements and specifications. (10S-90)

- Quality assurance – All those planned or systematic actions necessary to provide adequate confidence that a product, process, or service will conform to established requirements. (10S-90)

- Quality audit – A formal, independent examination with intent to verify conformance with the acceptance criteria. An audit does not include surveillance or inspection for the purpose of process control or product acceptance. (10S-90)

Elements of Quality Measurement and Audit

Given that the objective or requirement of risk management in TCM is to increase the probability of achieving objectives, and quality is conformance to requirements, both precision and accuracy are important to quality measures. Audits are generally more qualitative in nature. The following are key concepts related to measurements and audits in a quality program for risk management:

- Measures – Quantification of any attribute of a process or deliverable.

- Metrics – Qualitative (e.g. more or less) or quantitative (e.g. numerical value) measures indicative of quality; i.e. a measure of conformance to a requirement, objective or baseline.

- Key performance indicators – Selected (i.e. key) metrics considered to be reliably indicative of performance relative to strategic objectives.

- Precision – Consistency of repeated measured values regardless of the values nearness to the true value.

- Accuracy – Nearness of measured values to the true values.

- Variances:
  - Random variations might be normal (i.e. noise), depending on the processes used but the variance has no discernible trend and when significant are generally unexpected; in the worst case, this can indicate a process that is out of control.
  - Known or predictable variances are those known to exist in the process because of particular characteristics of the process or its outputs. These are generally unique to a particular application. They may display a "trend" (e.g. increase or decrease over time) that indicates improving or deteriorating performance.
  - Variances that are always present in the process across all applications. The process itself will have inherent variability that is perhaps caused by human mistakes, machine variations or malfunctions, the environment, and so on. Variances that do not fall within the acceptable range usually require process improvement. Decisions to change the process always require management approval as part of governance.

- Quality audit: a structured, independent review to determine whether process activities and deliverables comply with enterprise, program and project requirements, policies, standards, processes, and procedures as applicable. The objectives of a quality audit are:
  - Identify the enterprise, program and project requirements, policies, standards, processes, and procedures against which the activities and deliverables are being measured.
  - Identify all the gaps/shortcomings.
  - Identify any overlaps/duplication of effort.
  - Identify all the good/best practices being implemented.
  - Share the good practices introduced or implemented in similar programs or projects in the organization and/ or industry.
  - Proactively offer assistance in a positive manner to improve implementation of processes to help the team meet its goals.
  - Highlight contributions of each audit in the lessons learned repository of the organization.

The subsequent effort to correct any deficiencies should result in a reduced cost of quality and an increase in sponsor or customer acceptance of the products of the process. Quality audits may be scheduled or random and may be conducted by internal or external auditors. Quality audits can confirm the implementation of approved

change requests including corrective actions, defect repairs, and preventive actions. Experienced specialists generally perform quality audits; the specialist's job is to produce an independent evaluation of the quality process. Some organizations are large enough to have their own quality assurance departments or quality assurance teams; others might have to hire contract personnel to perform this function. Internal quality assurance teams report results to the program, project team, and management team of the organization as appropriate. External quality assurance teams report results to the customer, i.e. the entity that hired them.

Quality assurance and control focus on consistent (predictable variance) performance of a process or practice, i.e. improving precision in measures. However, over time, continuous improvement of the process also seeks to improve the accuracy of its outcomes given the inherent risk situation. Keep in mind that accuracy itself is not a measure of quality; it is largely an artifact of risk (i.e. the fact that one project has more risk and a wider accuracy range than another project does not mean that the riskier project's management or deliverables are of lesser quality).

Risks in Risk Management Quality Programs

Governance of risk management must consider the enterprise's appetite for risks and expectations for innovation and dynamic capturing of opportunities. A potential risk of excessive governance and QA/QC is that these sub-processes can contribute to bureaucracy (e.g. measurement for measurement's sake) and paralysis (e.g. failure to act for fear of deviation in metrics). In establishing a quality program, its flexibility to deal with evolving organizational and process maturity, changing environments, events and so on should be considered. Similarly, the cost of quality must be considered, i.e. at some point the cost of quality management may exceed its benefit.

ELEMENTS OF A QUALITY PROGRAM

In TCM, quality is the conformance to and improvement of internal processes and procedures in order to meet stakeholder requirements and thus the focus is internal to the enterprise and its portfolio, program and project management.

The plan, do, check, act (PDCA) cycle as shown in Figure 1 is the framework for TCM because it is:

1. Time-proven and widely accepted as a valid management model
2. Quality driven

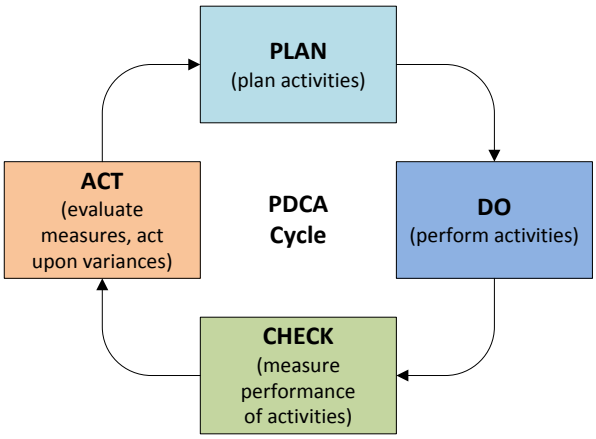

Figure 1 – The Plan, Do, Check, Act Cycle for Improvement

For the risk management process as described in TCM Section 7.6, and summarized in Figure 2, the PDCA process is reflected in four steps - plan, assess, treat and control. While each enterprise, program and project will develop its

own risk management process, the TCM provides a good representative model for outlining elements of a quality program applied to risk management (i.e. a quality management process is always defined in respect to another process).

The following sections of the RP track the elements of quality management as they apply to the steps in Figure 2. For example, it starts with describing the elements of quality management in the risk planning step, and then moves through the various potential measurement or audit points in the process flow such as assuring the application of risk registers during risk assessment, treatment and control.

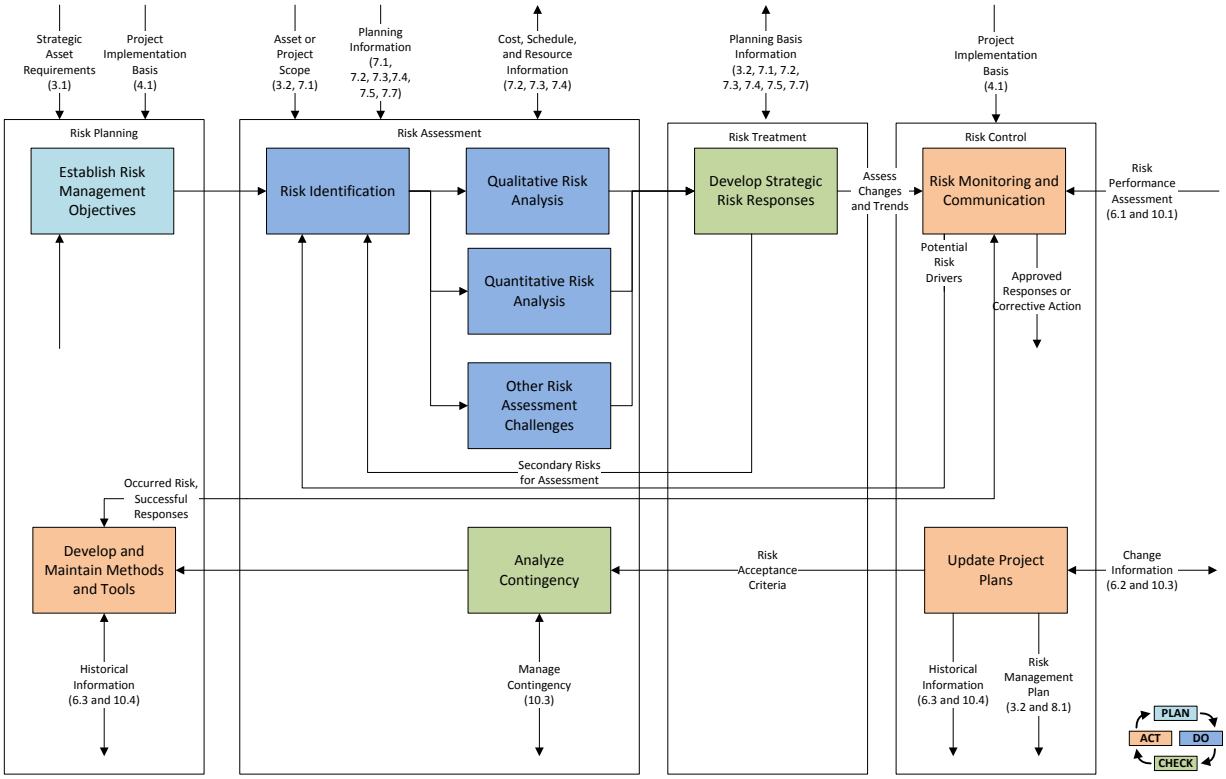

Figure 2 – Risk Management Process per TCM Section 7.6

Risk Planning: Elements of Quality

The following are elements of quality management to integrate into the risk management process. RP 72R-12 *Required Skills and Knowledge of Decision and Risk Management* defines the scope of a typical risk management plan including a sample table of contents with a compliance section that would address governance, quality assurance and control (that RP also mentions audits, KPIs and other quality topics, but not in detail):

- A risk management plan (RMP) may be developed at the portfolio, program or project level. The risk management plan should identify the objectives and requirements for governance, quality assurance and quality control of the process covered by the risk management plan. Those requirements should be aligned within the process hierarchy (e.g. project with a program) and with the strategic objectives and risk policies of the enterprise overall and its enterprise risk management (ERM) program.

- The quality management process within risk management should identify quality requirements and/or standards, regulation or policies for the steps and products of risk management, and documenting how the compliance will be demonstrated.

- A regulation is mandatory. Regulations are almost always imposed by governments or institutions. However, organizations might have their own self-imposed regulations that they should be aware of as well. Regulations require strict adherence, particularly in the case of government-imposed regulations, or fines may occur.
- A standard is something that's approved by a recognized body and that employs rules, guidelines, or characteristics that should be followed. Standards aren't legally mandatory; however, disregarding accepted standards can be a risk.
- The quality policy defines general requirements and guidelines for quality management processes and practices such as applied in risk management. It is up to the project manager to understand this policy and incorporate any predetermined company guidelines into the quality plan.
- It is the responsibility of the project management team to assure that all key project stakeholders are aware of and have received copies of the quality policy.

The quality management plan for risk management should identify key governance, quality assurance, and quality control activities, timing, resources, methods and tools.

Risk Planning: Quality Management Plan Elements

- **Activities**: Incorporate quality tasks (measurements, audits, quality improvement practice sessions, etc.) into the risk management process and plan.

- **Timing**: When a new risk management process is implemented it is important to have it audited and measured on a regular basis. Start with quality reviews of the risk management plan, and then begin periodic reviews as soon as the first risk is entered into a risk register. To reduce interference with the risk management process, the dates of audits should be coordinated with risk management deliverable due dates and milestones. Initially, audits may be conducted monthly but can be reduced in frequency as the risk management process matures. Determine whether QA/QC reviews can be built into the project system phase-gate review process. Separately, a governance team or independent third party should audit the overall risk management process at least annually.

- **Resourcing**: Incorporate QA/QC resources in a risk management roles and responsibilities matrix (e.g. a RASCI matrix). Consider the qualifications of resources. Address the need to augment the internal program with outside consultants if in-house audit expertise is insufficient or shorthanded.

- **Training:** Plan for training if necessary, in methods and tools such as how to use QC matrices and checklists and how to conduct or support audits. The overall team may benefit from general education (e.g. lunch & learn sessions) regarding quality management, why it is important and what is involved. Use available communication tools and venues to increase risk management quality awareness.

- **Document Control**: Ensure there is a risk section in program and project files with a unique numbering system and within that a quality management section. Document the record and communication retention and backup policy; key documents and deliverables are always to be filed in the central directories, not on personal files (there may be regulatory and legal issues to consider relative to retention).

Risk Planning: Develop and Maintain Methods and Tools for Quality

RP 72R-12, *Developing a Project Risk Management Plan* identifies many methods and tools for risk management. The following are methods and tools that might be used in quality management of the risk management process, methods and tools. These must be planned, developed and maintained as appropriate:

- **Organizational Development:** The risk manager is responsible for the risk management process and its quality. The risk management manager, with visible and explicit leadership support, will ensure that resources are available to carry out the quality work and that they have the appropriate competency, or define how the competency will be developed or improved.

- **References:** Provide education and reference materials relative to quality (e.g. policies, standards, etc.) so team members know or can learn what is expected of them regarding the QA/QC program.
  - **Risk Management Maturity Matrix (i.e. quality control checklist)**: This tool facilitates the review or audit of the risk management process and its evolution. One can compare their process to pre-determined best practice expectations. See the example in Appendix 1.
  - **Benchmarking:** Comparing one's process, systems and practices against those use by others internally or externally to identify possible improvement opportunities. This can supplement comparison to the risk management maturity matrix.
  - **Control Charts:** Tool used to determine whether or not a process is stable or has predictable performance. For example, a control chart could be used plot the number or percent of projects whose audits noted exceptions from requirements. This could include statistical sampling of recurring, tangible data.
  - **Process Maps, Diagrams and Flowcharts:** These diagrams illustrate how components within a process or system are related and can readily show quality measurement points (i.e. flag steps, inputs and outputs or deliverables from a process for audit). The process map in Figure 2 is an example (quality check points could be highlighted on it).
  - **Brainstorming:** Can use as part of continuous improvement by the risk management team, with affinity diagrams and nominal group techniques, assess quality issues and identify possible improvements.

- **Risk Quality Metrics:** Also known as operational definition, describe what is being measured, how it will be measured during the quality control process, and what values or criteria. Although metrics are company and even project specific, e.g. which ones are important to them, some potential project risk quality metrics include:

Cost of unplanned events as a proportion of budget	On-time delivery of treatment plans vs. due date
Internal audit rating	Percent of treatment plans above target score
Risk treatment plan properly and adequately addresses risk item	Risk documents properly filed
Measured risk control effectiveness	Various other scores from a risk quality checklist/matrix. Refer to Appendices 1 and 2
Expected monetary value (EMV) as a proportion of a portfolio valuation	Contingency draw down - risk vs. scope changes
Change in EMV	Cost and schedule accuracy trends

- **Systems Evaluation**: Prior to developing or acquiring risk management software tools, define a process for developing system requirements and assessing system development, acquisition, operation plans, and proposals against those requirements.
- **Checklists:** These are structured tools used to verify that pre-defined required steps have been performed or deliverables have the required attributes. A checklist can be augmented with a rating scheme to measure the degree or extent of compliance with requirements. See Appendix 1 and 3 for examples.

- **Quality Improvement Practices:** As part of risk planning, methods are defined for assessing the findings from quality measurements or audits and making corrective or improvement actions. In addition to finding deficiencies to correct, an audit may identify potential ways of improving the performance of the evaluated step or value of the deliverables. Structured (i.e. resourced with defined deliverables) "continuous-improvement" and/or "value improving practices (VIPs)" will help ensure that opportunities that are identified are capitalized on. These practices may take the form of a process improvement plan. To the extent that risk management process quality improvements affect a program or project control baseline, they will be implemented through the change management process. Also, improvements should be captured in a lessons learned database, disseminated, utilized at each stage gate, and, ideally, used to develop RMP enhancements at each stage gate.

- **Process Analysis:** The structured quality improvement should include steps to assess the risk management process including the following:
  - Problems experienced while conducting risk management.
  - Constraints experienced while conducting the work of risk management.
  - Inefficient and ineffective risk processes identified during risk management process.
  - Issues with interfaces between risk management and other TCM Framework processes.
  - One of the techniques of process analysis includes performing root cause analysis (so that preventive actions can be planned to effectively address the problems).

- **Threats and Opportunities:** Identify threats and opportunities that may impact risk management quality requirements.

- **Elements to Consider:** Some of the elements that should be considered when analyzing a process include:
  - Process boundaries, which describes the purpose for the process and its expected start/end dates, inputs/outputs/data required; economy/efficiency/effect.
  - Owner, stakeholders, teams and other organizational aspects.
  - Process configuration so that you know what processes are performed when and how they interact.
  - Systems analysis that considers the effectiveness of any IT or other tools supporting the process.
  - Communication of information within the process and with other related processes.
  - Risk metrics which allow analysis of process efficiency and effectiveness.

RISK ASSESSMENT: QUALITY MANAGEMENT PRACTICES

The following are key activities to incorporate in the quality aspects when planning risk assessments (refer to TCM Framework section 7.6 and RP 62R-11 *Risk Assessment: Identification and Qualitative Analysis* for details of risk management activities and products to assess):

- Measure/audit risk register utilization using a checklist (see example in Appendix 3).

- Measure/audit risk identification and analysis workshops and other information collection steps using feedback forms.

- Measure/audit risk quantification performance and deliverables (e.g. contingency determination, contingency management associated with change management, etc.) to assure practices and products meet requirements per Appendix 1.

- These audits may be part of phase-gate review and investment decision making process. Refer to RP 40R-08, *Contingency Estimating – General Principles*[11] for additional information on principles of contingency determination.

Risk Treatment: Quality Management Practices

The following are key activities to incorporate in the quality aspects when planning risk treatment (refer to TCM Framework section 7.6 and RP 63R-11, *Risk Treatment* for details of risk management activities and products to assess):

- Measure/audit treatment plans with a scorecard (see example in Appendix 2).

- Measure/audit integration of treatment plans with project control or program change management processes and practices.

Risk Control: Quality Management Practices

The following are key activities to incorporate in the quality aspects when planning risk control (refer to TCM Framework section 7.6 for details of risk management activities and products to assess).

- Risk control primarily involves the periodic or as-needed update and maintenance of risk assessment and treatment over the life cycle of the program or project; see measurements/audits for assessment and treatment.

- Measure/audit capture of risk management measures, metrics and KPIs during execution.

- Measure/audit risk management closeout reports to ensure capture of measures, metrics, KPIs and lessons learned in alignment with knowledge management/historical data processes as well as risk management methods and tool development requirements (e.g. feedback for improved checklists, registers, contingency models, etc.).

Cost of Quality

The cost of quality is a consideration of how much must be spent to achieve the expected level of quality within risk management. Philip Crosby developed the theory of "zero defects"[8], which deals with prevention costs. Loosely translated, this means doing it right the first time. It must consider the expense of all the activities within a risk management quality program to ensure its quality. This cost of quality is divided up into two major categories:

- Cost of conformance to requirements (i.e. the cost of completing the risk management work to satisfy the project scope and the expected level of quality).

- Cost of non-conformance (i.e. the cost of completing the risk management work without quality). The biggest issue here is the money lost by having to redo work the risk management program failed to address in a quality way.

Don't confuse inspection with prevention. These are two different tools. Inspection keeps errors in the process from reaching the customer. Prevention keeps errors from occurring in the process. It always costs less to prevent

problems in the first place than it does to fix problems built into the process after the fact. Rework, labor costs, material costs, and potential loss of customers are all factors to consider when weighing the cost of quality of a risk management program.

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CONTRIBUTORS

Disclaimer: The opinions expressed by the authors and contributors to this recommended practice are their own and do not necessarily reflect those of their employers, unless otherwise stated.

David C. Brady, P.Eng. DRMP (Author)
John K. Hollmann, PE CCP CEP DRMP (Author)
Dr. Alexia A. Nalewaik, CCP (Author)
James E. Arrow, DRMP

APPENDICES

APPENDIX 1: EXAMPLE OF A RISK MANAGEMENT QUALITY CONTROL CHECKLIST
APPENDIX 2: EXAMPLE OF A TREATMENT PLAN QUALITY ASSURANCE PROGRAM
APPENDIX 3: EXAMPLE OF A PERIODIC RISK REGISTER QC REPORT

APPENDIX 1: EXAMPLE OF A RISK MANAGEMENT QUALITY CONTROL CHECKLIST

Although this checklist is designed for a risk management quality control program it may be a basis for a risk management maturity model. For each activity, an explanation of the scoring criteria (e.g. unacceptable, non-satisfactory, etc.) is provided. For example if a risk management plan is not developed it will be scored as 0. When all evaluation activities have been scored, this will provide a summary of where improvements are required and an overall rating of the project's risk program. It can also be used to compare the quality of various projects within a program management organization.

Evaluation Matrix (See TCM Section 7.6 process in Figure 2)	**Unacceptable (0)**	**Non-Satisfactory (1)**	**Satisfactory (2)**	**Good (3)**	**Excellent (4)**
	Observed Behavior	**Observed Behavior**	**Observed Behavior**	**Observed Behavior**	**Observed Behavior**
RISK PLANNING					
Risk Management Requirements and Objectives	Risk management requirements and objectives not known or communicated.	Risk management requirements and objectives are documented, but unclear or incomplete.	Risk management requirements and objectives documented and adequate as a basis for risk management planning though some gaps remain.	Risk management requirements and objectives documented and adequate as a basis for risk management planning; no major gaps.	All risk management requirements and objectives are comprehensively documented and well communicated.
Risk Management Plan (RMP)	RMP not developed.	RMP developed but not per company requirements, standards and/or procedures. All parts of the company's standard RMP table of contents are not addressed.	All parts of the RMP table of contents have been addressed, with small room for improvement. RMP properly filed.	All parts of the RMP table of contents have been adequately addressed. RMP properly distributed and filed.	All parts of the RMP are aligned with requirements and procedures have been thoroughly addressed. RMP is fully aligned with other plan documents.
Approvals		There are no approval signatures on the original and/or any revisions.	RMP is properly signed-off.	RMP, including all revisions, are properly signed-off.	
RISK IDENTIFICATION					
Risk Description	Basic 3-part Risk description information is incomplete.	Basic 3-part Risk description, including a title and trigger Risk, is entered but is not accurate.	Basic 3-part Risk description information including a unique title, consequence type, trigger Risk, RBS or work area, is entered, is accurate, but with small room for improvement.	All identification incident information is entered and is accurate. RMP requires a risk description form (or similar) and is completed.	All identification information is entered and is accurate. Information is drilled down to its detailed level. Risk description form, completed per RMP, initialed by the PM, and is properly filed.
Risk Data	Risk description contains inappropriate or private information.	Risk details incorrect or insufficient to explain the Risk.	Risk details are entered and are generally adequate to explain the Risks causal factors with some room for improvement.	Risk details are entered and are sufficient to explain the Risk's causal factors, e.g. 5-whys conducted.	Risk details are entered and thoroughly explain the Risks causal factors by identifying the root cause.
RISK ANALYSIS: QUALITATIVE					
Risk Matrix	Risk matrix not per company standard.	Risk matrix is basically per company standard but has some unapproved revisions.	Risk matrix is per company standard and revisions have been approved.		

Evaluation Matrix (See TCM Section 7.6 process in Figure 2)	Unacceptable (0)	Non-Satisfactory (1)	Satisfactory (2)	Good (3)	Excellent (4)
	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior
Risk Ranking	Risk likelihood and/or consequence are not entered.	Risk likelihood and/or consequence ratings appear to be inconsistent with the event description. The explanation of how the risk ranking was derived is insufficient.	Risk likelihood and/or consequence appear to be correct with respect to the description. The explanation of how the risk ranking was derived is sufficient.	The explanation of how the risk ranking was derived is well documented with electronic links to the risk register when available.	The explanation of how the risk ranking was derived, linked, and allows replication by similar people.
Existing Controls/Safeguards	No controls or safeguards provided.	Controls and/or safeguards provided but too vague to be able to properly verify.	Controls and/or safeguards provided exist but specific reference information, e.g. document numbers, are not provided.	Controls and/or safeguards provided exist and specific reference information, e.g. document numbers, are provided.	Controls and/or safeguards provided exist and specific reference information is electronically linked to the risk register.
Financial Impact Information	No financial risk impact information provided.	Financial risk impact information provided but not consistent with the selected financial consequence rating.	Financial risk impact information provided and is consistent with the selected financial consequence rating but not in an actual digital dollar amount, i.e. $300,000; not $300000+/- or $300K.	Financial risk impact information provided and is consistent with the selected financial consequence rating and is in an actual digital dollar amount, e.g. $300,000.	Proper financial risk impact information provided and is used to determine expected monetary values.
Risk Treatment Owner	Risk treatment owner is not identified.	Risk treatment owner is identified as a company, a group, or a team.	Risk treatment owner is identified as a specific role position, e.g. Construction Manager, VP Operations, or a named individual.	Risk treatment owner is identified as a specific role position, e.g. Construction Manager, VP Operations, or a named individual and has been notified in writing.	Risk treatment owner is identified as a specific role position, e.g. Construction Manager, VP Operations, or a named individual and has been notified in writing using a standard format which is filed in the project directory.
Due Date	Risk treatment plan due date is not provided.	Risk treatment plan due date but is not realistic or not compatible with the risk trigger information.	Risk treatment plan due date is provided and appears to be realistic.	Risk treatment plan due date is provided and agreed to by the risk treatment owner.	Risk treatment plan due date is provided, agreed to by the risk treatment owner, and has only been revised through no fault of the risk treatment owner.
RISK ANALYSIS: QUANTITATIVE					
Modeling Techniques	No analysis of any type undertaken.	Cost and/or schedule analysis of some sort carried out but without proper procedures or facilitation.	A cost and schedule analysis was completed following basic procedures and facilitation.	A cost and schedule analysis was completed following best practices, procedures, and facilitation.	A fully integrated, comprehensive cost, schedule, and risk analysis was completed under proper facilitation.

Evaluation Matrix (See TCM Section 7.6 process in Figure 2)	Unacceptable (0)	Non-Satisfactory (1)	Satisfactory (2)	Good (3)	Excellent (4)
	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior
Report and Application	No report issued.	Report only providing a contingency amount.	Basic report for each analysis developed providing a possible contingency and some sensitivities.	Individual reports issued that follows the analysis table of contents in the RMP. However, findings were not used to improve project plans	One complete report issued, signed by relevant parties, and distributed following the approved RMP format. Findings were used to improve the underlying plans as appropriate
RISK TREATMENT					
Treatment/Action Plan Details	No treatment or action plans provided.	Action plan provided but is too vague and high level to be able to realistically lower the residual risk level. No estimate of revised financial impact or costs to implement the plan.	Adequate corrective and/or preventive actions assigned to address the immediate causes of the specific risk.	Adequate corrective and/or preventive actions assigned to address the immediate and root causes of the specific risk. Opportunity for improvements in tasking re: planned finish, task text, person responsible, etc.	Thorough corrective and/or preventive actions assigned to address the immediate and root causes of the specific and related risks.
Treatment QC Matrix	No quality control review/scoring of treatment plans provided.	Score below 66% on treatment QC matrix.	Score 66% to 74% on the treatment QC matrix.	Score 75% to 99% on the treatment QC matrix.	Score 100% on the treatment QC matrix
Treatment/Action Plan Implementation		No evidence of work undertaken (i.e. task long text).	Evidence of work completed provided but inadequate to determine if completed successfully.	Basic evidence (i.e. task long text) of work completed, provides adequate information to determine if tasks completed successfully.	Full evidence (i.e. task long text, attached documents, project folders, etc) of work completed successfully. A type of risk treatment approval form signed by all parties.
Residual Financial Impact Information	No financial risk impact information provided.	Financial risk impact information provided but not consistent with the selected financial residual consequence rating.	Financial risk impact information provided and is consistent with the selected financial consequence rating but not in an actual digital dollar amount, i.e. $300000+/- or $300K.	Financial risk impact information provided and is consistent with the selected financial consequence rating and is in an actual digital dollar amount, e.g. $300,000.	Proper financial risk impact information provided and is used to determine expected monetary values.
Cost of Action Plan	No indication of a cost to implement the treatment/action plan.	Cost to implement the treatment/action plan provided but no indication as to how determined.	Cost to implement the treatment/action plan provided with an indication as to how estimated. N/A stated if not applicable.	Cost to implement the treatment/action plan provided with backup as to how estimated available.	Cost to implement the treatment/action plan provided with backup as to how estimated linked to risk register.

Evaluation Matrix (See TCM Section 7.6 process in Figure 2)	Unacceptable (0)	Non-Satisfactory (1)	Satisfactory (2)	Good (3)	Excellent (4)
	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior
Potential Change Notice (PCN)	No process to setup a potential change notice for treatment plans.	Project controls group informally made aware of treatment plans with no other follow-up.	Project controls group formally made aware of treatment plans that are not covered by the existing scope and/or contingency by attendance at regular risk review meetings.	Project controls group formally made aware of treatment plans that are not covered by the existing scope and/or contingency by a written notice.	Project controls group formally made aware of treatment plans that are not covered by the existing scope and/or contingency by an approved project change management process.
RISK CONTROL					
Integration with Project Control	Risk management not aligned or communicating with project control.	Risk management and project control interfacing ad-hoc or inconsistent.	Risk management and project control interface is reasonably functional.	Risk management and project control interface is functioning well with some gaps.	Risk management and project control (e.g. risk info used in change management, forecasting) fully aligned and integrated.
Meetings	No review or monitoring being done.	Informal and sporadic review sessions. Inconsistent attendance.	Regularly scheduled meetings with less than 50% cancellation or postponement. Invited attendees but numerous substitutions or no-shows.	Regularly scheduled meetings with less than 25% cancellation or postponement. Invited attendees with substitutions or no-shows less than 25% of the planned meetings.	Regularly scheduled meetings with less than 10% cancellation or postponement. Invited attendees with no substitutions or no-shows less than 10% of the planned meetings.
Register Updates	No data entered or revisions in risk register or minutes recorded.	Minimal or inaccurate data entered in the risk register on the status, business impact, compliance, documents or cost sections. Minimal or inaccurate data entered in the risk register regarding comments.	Generally accurate information entered in the risk register on the status, business impact, compliance, documents or cost sections. Some key trending information is provided. Generally accurate comments entered in the risk register but no information on when and who recorded.	Generally accurate information entered into the risk register on the status, business impact, compliance, documents or cost section of the risk/costs/actions tab. Key information (business impacts, compliance) necessary to support trending is provided. Generally accurate comments entered in the risk register with information on when and who recorded.	Thorough use of the business impact, compliance, documents or cost section of the risk/costs/actions of the risk program. Data is sufficient to fully support future event trending and analysis. Accurate comments entered in the risk register with information on when and who recorded. Data is sufficient to fully support future forensic analysis.
Closeout and Lessons Learned	No closeout process or procedure. Risk information not captured or analyzed. No lessons learned of any type.	Some or partial capture of risk information and/or lessons learned.	Capture of minimal level of risk information (e.g. risk register records if risk happened) and lessons learned in all key areas.	Risk register records if risk happened and what were the actual consequences compared to what the evaluation predicted. Use may not be evident.	Comprehensive capture, analysis and management of information with evident use in risk management planning, methods and tools development and/or Predictive Analytics.

Evaluation Matrix (See TCM Section 7.6 process in Figure 2)	Unacceptable (0)	Non-Satisfactory (1)	Satisfactory (2)	Good (3)	Excellent (4)
	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior	Observed Behavior
MISCELLANEOUS					
Comment Field	No comments provided.	Comments provided but not provide any validating any decisions made during the course of the evaluation.	Comments provided and provide some information for validating decisions made during the course of the evaluation.	Comments provided and provide some information for validating decisions made during the course of the evaluation with an indication of when comments recorded and by whom.	
RBS/Categories		No RBS or other type of categorization used.	Categories used but not being used for any further evaluation or historical work.	Categories used and being used for further evaluation within the project.	Categories used and being used for further evaluation within the project and PMO.
Risk Approval Form				Some type of risk treatment form used for accountability that work completed.	RAF tracked, signed off, and filed within project directory.
High Risks to Corporate	No high level risks forward to anyone outside of the project team.	High level risks forward to PMO.	High level risks forward to corporate management. Similar medium and/or low level risks affecting the same strategic strategy reported.	High level risks forward to corporate management on a regular basis, e.g. quarterly. Similar medium and/or low level risks affecting the same corporate strategic strategy reported to corporate.	High level risks forward to corporate management on a regular basis, e.g. quarterly. Similar medium and/or low level risks affecting the same corporate strategic strategy reported to corporate on a regular basis, e.g. quarterly.
Stakeholders	Stakeholders very disappointed and feel risk management a waste of their time and money.	Stakeholders are not satisfied with a number of aspects of the risk management program and want improvements made.	Most stakeholders are basically satisfied with the over risk management program.	75% or more of stakeholders express pretty well complete satisfaction of risk management program as defined by notes in the stakeholder log.	>90% of stakeholders express pretty well complete satisfaction of risk management program as defined by notes in the stakeholder log.
Corporate Standards	No corporate risk standards and/or procedures exist.	Corporate risk standards and/or procedures exist but not formally approved, signed-off, or issued.	Very basic corporate risk standards and/or procedures exist and have been formally issued but should be improved.	Good corporate risk standards (i.e. succinct without unnecessary boiler plate information) lead to corporate risk procedures to specific project risk processes as required.	
Metrics			Project metrics in regular project reports.	Corporate specific metrics reported on a regular basis.	

APPENDIX 2: EXAMPLE OF A TREATMENT PLAN QUALITY ASSURANCE PROGRAM

There will be many ways the QA program can be implemented. The following example is provided for information only. This example explains the criteria for the ratings in a QA treatment plan. In this example (Table A2-1 *Treatment Plan Scoring Criteria*) a basic 0, 1, 2, 3 scoring system is used with a description of what can constitute a specific score. The treatment plan should only rate the criteria agreed to by the project team. It should not be a critique to the plan itself; this is the responsibility of the risk team, risk owner, and risk treatment owner.

- Criteria category: GENERAL (what is actually to be done)

GENERAL	DESCRIPTION	SCORE
Detailed	Plan is well described, complete, and easily followed/understood. It may be described in the register as included as an attachment or link.	3
General, details missing	Plan appears to be OK but some details look like they may be missing for ensuring proper execution.	2
Difficult to implement w/o more work	A plan has been suggested but it is incomplete and reviewer does not see how it can even be implemented without details, explanations, etc.	1
No mention	There is no mention of how the treatment plan is to be implemented, even if the risk is considered acceptable.	0
Not applicable	If risk considered acceptable, and it is stated as such (e.g. “acceptable as is”), then a detailed plan description may not be considered necessary.	3

- Criteria category: WHO (is to do the work in developing the treatment plan)

WHO	DESCRIPTION	SCORE
Specific person	A specific person is named, whether from the project team, the owner, or a contractor/vendor.	3
Company or team	A specific team is named, whether from the project team, the owner, or a contractor/vendor.	2
Action owner (by default)	If no person or team is mentioned then by default it has to be the action owner’s responsibility. (Some companies may wish to make this the risk owner.)	1
Not applicable	If risk considered acceptable, and it is stated as such (e.g. “acceptable as is”), then a person may not be required and “who” defaults to the action owner.	3

- Criteria category: WHEN (is the development or implementation to be completed)

WHEN	DESCRIPTION	SCORE
Specific date/schedule	The action plan completion/implementation is included in the project schedule or a specific date is mentioned.	3
General range	A date range is provided, e.g. Q1, a year, a month.	2
Action due date	The action due date is referenced but not unequivocally stated as plan to be completed by then.	1
No mention	There is no mention of when the plan is to be implemented/completed so it is difficult to track its progress.	0
Not applicable	If risk considered acceptable, and it is stated as such (e.g. “acceptable as is”), then a completion date is not required.	3

- Criteria category: COSTS (of developing and implementing the plan)

COSTS	DESCRIPTION	SCORE
In estimate	The cost for the treatment plan has been properly estimated and included in the project's estimate at completion (EAC).	3
Guesstimate	The project team has made a guess as to what the costs may be but it is not covered in a potential change order or the EAC.	2
$0	The treatment owner feels the is no additional cost associated with the implementing the action plan but no details or reason is provided.	1
No mention	There is no mention of a cost (estimated, actual, or no cost).	0
Not applicable	If risk considered acceptable, and it is stated as such (e.g. "acceptable as is"), then a cost is not required. (NOTE – this is not a cost associated if the risk does happen).	3

- Criteria category: DUE DATE (when the plan has to be completed by)

DUE DATE	DESCRIPTION	SCORE
Made original date	Treatment/action plan was completed and signed off by the original due date.	3
Made revised date	Original due date was missed but treatment/action plan was completed and signed off by an approved revised due date.	1
Missed approval date	Plan was completed but missed the due date, whether the original or the approved revision.	0

- Criteria category: RANKINGS (If this criteria is used it needs to be completed by a senior risk professional who has experience with the project's type of work, how treatment plans should be developed, and the company's method for ranking risks (e.g. likelihood and consequences). These rankings will be very arbitrary based solely on the reviewer's experience and completeness of the plan.

RANKINGS	DESCRIPTION	SCORE
Reasonable	The review feels the residual risk score is reasonable or appropriate.	3
To be reviewed	The review feels the residual risk score may be reasonable or appropriate but has some questions as to why or how the ranking was developed.	2
Questionable	The review feels the residual risk score is not reasonable or appropriate and needs to be reviewed by the project team, action owner, and/or risk owner.	1
Not applicable	If risk considered acceptable, and it is stated as such (e.g. "acceptable as is"), then the residual risk should equal the previous risk ranking.	3

GENERAL	Score	WHO	Score	WHEN	Score	COSTS	Score	DUE DATE	Score	RANKINGS	Score
Detailed	3	Specific person	3	Specific date/schedule	3	In estimate	3	Made original date	3	Reasonable	3
General, details missing	2	Company or team	2	General range	2	Guesstimate	2	Made revised date	1	To be Reviewed	2
Hard to implement w/o more work	1	Action owner (by default)	1	Action due date	1	$0	1	Missed approved date	0	Questionable	1
No mention	0	Not applicable	3	No mention	0	No mention	0			Not applicable	3
Not applicable	3			Not applicable	3	Not applicable	3				

Table A2-1 – Treatment Plan Scoring Criteria

Table A2-2, *Treatment Plan Weighting Matrix* is to indicate what criteria can be applied to each action plan option whether the risk is a threat (potential actions: transfer, eliminate, accept, mitigate) or an opportunity (potential actions: share, exploit, accept, enhance). Each criteria is then weighted to help determine which criteria are most important to the company.

Note that the color coding in Table A2-2 coincides with the color coding in Table A2-1. The color coding helps to associate a weighting rank with a criteria category.

The weighting shown is an example. The actual weighting, i.e. the importance of each criteria, is to be determined by the risk team. The weighting is used in determining the final risk QA score (see Table A2-3 and A2-4 for an example of how it is used).

CRITERIA CATEGORY	CRITERIA	Transfer/Share	Eliminate/Exploit	Accept/Accept	Mitigate/Enhance	WEIGHT [Determined by the risk team]
GENERAL	What is the Deliverable?	Y	Y	NA	Y	0.1
GENERAL	Why is this being done this way?	Y	Y	Y	Y	0.05
GENERAL	How is the work being done?	Y	Y	NA	Y	0.2
GENERAL	Are secondary risks identified?	Y	Y	Y	Y	0.1
GENERAL	Is there a plan "B"?	Y	NA	Y	Y	0.1
						SUB TOTAL: 0.55
WHO	Who is doing the work / responsibility for implementing it	Y	Y	Y	Y	0.05
						SUB TOTAL: 0.05
WHEN	When is it to be complete? Details of the mechanism and frequency of review?	Y	Y	Y	Y	0.05
						SUB TOTAL: 0.05
COSTS	What are the costs (response and revised impact)	Y	Y	Y	Y	0.1
						SUB TOTAL: 0.1
DUE DATE	Due date	Y	Y	Y	Y	0.2
						SUB TOTAL: 0.2
RANKINGS	Revised RR rankings	Y	Y	Y	Y	0.05
						SUB TOTAL: 0.05
					CHECK TOTAL :	**1.00**

Table A2-2 – Treatment Plan Weighting Matrix

Table A2-3 is an example of how the different ratings may be interpreted as a QA score and used as a key risk indicator (KRI) that can be part of a monthly report.

The percentage values associated with each KRI ranking should be determined by the risk team or organization. In the example below, a "good" KRI value is established at a minimum 75% of the maximum score of 3 (0.75 * 3 = 2.25).

- **Good** (Weighted score >=2.25 to <=3) indicates that no further review of the treatment or action plan is necessary.
- **Review** (Weighted score >= 2.0 to <2.25) indicates that the treatment may be acceptable but the reviewer has some questions or requires clarification and some additional information is probably required to make a complete action plan.
- **Revise** (Weighted score <2.0) indicates the action plan is incomplete and needs to be revised before it should be signed-off as it probably doesn't adequately address each of the criteria shown in Table A2-1.

Target KRI	%	Score
Good	>75%	>2.25
Review	67%	2.00
Revise	<67%	<2.0

Table A2-3 – Target KRI Ratings Breakdown

See Table A2-4 for an example of a risk register scored per the information shown in Tables A2-1, A2-2, and A2-3.

ALL HAZARDS	Risk Identification		Inherent Risk Ranking		Risk Response / Action - Residual Risk			Action Plan QA Scoring		Target QA Scores		<2	2 to 2.25	>2.25	Weightings	0.55	0.05	0.05	0.05	0.1	0.2	1
Risk ID No.	STATUS	Event/Scenario	Safeguards / Controls	Inherent Risk	Risk Response Action Plan	Response Cost	Residual Risk	General	Who	When	Costs	Meet Due Date	Revised Ranking	Total		Gener	Who	When	Costs	Meet Due Date	Revised Ranki
A-17	Signed/ Monitor	Degradation of Project assets.		II	1) Preservation plans in place and being		II	General, Details Missing	Action Owner (by default)	Action Due Date	No Mention		Questionable	1.40		2	1	1	0	0	1
F-95	Signed/ Monitor	Crossing 3rd Party pipeline	No known Safeguard at time of analysis	II	Construction execution plan to address line construction		III	Hard to Implement w/o more work	Action Owner (by default)	Action Due			easonable	1.25							
A-222	Signed/ Monitor	Lack of water discharge locations		II	All contaminated and/or potentially contaminated		III	General, Details Missing	Action Own (by default)				Reasona			2	1	1	0	3	3
D-143	Signed/ Monitor	Land and space allocation not secured for 2010		II	Gap analysis started for the area. Regulatory Approvals group spearheading by		III	Detailed	Specific person	Specific date/Schedule	No Mention		Reasonable	2.55		3	3	3	0	0	3
D-219	Signed/ Monitor	Fire Water Availability Issue		I	Project design covered by TDN xxxxxxxxxx-6. This issue was		III	Detailed	Specific person	Specific date/Schedule	No Mention		To Be Reviewed	2.35		3	3	3	0	0	2

KRI =Sum of Weightings x Individual Category Scores = (0.55*2) + (0.05*1) + (0.05*1) + (0.05*0) + (0.1*0) + (0.2*1) = 1.4

From Table A2-1 – Treatment Plan Scoring Criteria

From Table A2-2 – Treatment Plan Weighting Matrix

The sum of the weightings must equal 1

Table A2-4 – Example of Risk Register QA Ranking

APPENDIX 3: EXAMPLE OF A PERIODIC RISK REGISTER QC REPORT

There are many ways in which quality control measures can be reported for a risk register. The criteria included in the report may be defined by the risk team, the organization, or other stakeholders.

Table A3-1 is an example of a project risk register QC report. It can be reviewed on a periodic basis (e.g. quarterly) to indicate incomplete register activities and/or to show changes in the quality of the register over time. Many of the terms used in this example are identified in Recommended Practices 62R-11[3], 63R-11[4], and 71R-12[5].

The columns in Table A3-1 represent the following:

- Report Criteria – Risk register information or metrics.
- Missing – If applicable, indicates the number of risks that have the required criteria missing.
- Status for Reporting Period – Indicates current status for the report criteria. May be used to explain some of the results and/or provide recommended actions.

Report Criteria	Missing	Register Count	Status for Reporting Period: 2016-Q3	
Number of status “active” risks		42	42	*Based on a count from the risk register.*
Number of status “signed/monitor” risks		22	22	*Based on a count from the risk register.*
Status “closed” risks		0	0	*Based on a count from the risk register.*
Number of initiated risks still to be analyzed		1	1 These should be addressed by the next report period	*A count of the number of potential risk events that have been entered into the register but not yet addressed by the project team.*
Missing financial impact information	2	65	2 of 65 (3%) are missing financial impacts	*Number of risks with dollar value of finance consequence missing.*
Missing RBS information	0	64	0 of 64 (0%) of active and signed-off risks are missing part or all of RBS information. To be updated by next reporting period.	*If a risk breakdown structure (RBS) is used, the number of risks missing RBS info.*
Missing WBS information			Risk management to coordinate this with project controls.	*If a work breakdown structure (WBS) used, the number of risks missing WBS info.*
No existing controls or safeguards mentioned	0	65	0 of 65 (0%). No known safeguards at this time.	*A count of risks that have no information about existing safeguards or controls.*
Missing due dates (> Level IV risk)	1	42	1 of 42 (2%) of active risks are missing due dates.	*A cell count of those risks that do not have an action plan developed and signed off by the lists due date.*
No triggers (active or signed status)	0	64	0% of all risks have no trigger stated. Please complete.	*A count of risks that do not have a trigger event identified.*
Did risk occur	0	22	0% of signed-off or closed risks have occurred. Review and update appropriate fields if required.	*A count of risks that have actually occurred, if the register tracks this data.*
Missing comments (except duplicates)	7	126	6% of all potential risks have comments. If necessary, please update. Also, put latest comments at top of cell.	*The number of risks that do not have the comments field up to date.*
Missing risk response action plan	1	22	1 or 5% of signed-off or closed are missing action plan information.	*The number of risks that do not indicate a response or action plan but show a change in the residual risk.*
Response costs	0	22	0 or 0% have no response costs as part of the action plan. Can these be completed? If not put either '0' or 'TBD' so we know it is not an oversight.	*Number of risks that do not show the cost of implementing the prescribed action plan*

Table A3-1 – Risk Register QC Report