



Developing Robust Business Cases

A Proven Approach to Optimize G&T Capital Budgets in a Tight Credit Market

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G&T executives are facing increased pressure to reassess capital expenditure levels in response to the recent credit crunch and a slowing economy. However, requirements remain to build additional generation, new transmission and address environmental regulations. The challenge is to optimize and reduce capital spending in this environment in a systematic fashion that recognizes cost-risk tradeoffs.

For many years, utilities have used some form of a business case to analyze and review projects before they receive funding. However, for most participants, this approach has become too much of a “just go through the motions” exercise. To be effective, the business case approach needs to become much more robust and useful to the engineers putting the cases together and to the senior management team needing to make the difficult capital allocation decisions.

The Case for Business Cases

G&Ts traditionally access capital from many sources, including RUS, CoBank, CFC and in some cases, commercial markets. With capital markets becoming tighter and potentially more expensive for G&Ts, a rigorous business case process will free up capital to fund other important projects or to provide a contingency for emergency projects. Perhaps more importantly, capital savings can be “pocketed” and used to maintain liquidity or improve a G&T’s equity ratio and credit rating, as well as help relieve pressure on member rates. This benefit is particularly important as many G&Ts face significant rate increases from rising coal costs, massive environmental control expenditures, higher purchase power prices, rising renewable portfolio standards and lower member sales ... all within an increasingly tight financing environment. Moreover, credit rating agencies are paying closer attention to balance sheets and liquidity in light of the scrutiny they have faced from regulators questioning whether they have been asleep at the wheel in their ratings.

Current State of Business—Going Through the Motions

Many utilities require some form of documentation and approval process for projects over a certain dollar threshold. Typically, the documentation provided by staff discusses the problem and provides cost estimates by year for a proposed solution. Occasionally, staff will also discuss the qualitative risks and perhaps even calculate a token net present value and payback. This documentation, however, is usually very thin on analytics, utilizes questionable or inconsistent assumptions and is not reviewed and challenged in any systematic way by other business units or senior management. This lackluster approach is inconsistent with the desire of the G&T Board and the cooperative General Managers who expect capital is being optimized. In MCR’s experience, this expectation of optimizing capital is not often realized because the process of developing and reviewing business cases typically encounters four problems leading to mediocre results: lack of strategic context, lack of direct Senior Team involvement, lack of rigor and lack of risk quantification.

The process will generate capital savings that can be “pocketed” and used to maintain liquidity or improve a G&T’s equity ratio and credit rating.

Lack of Strategic Context. The project evaluation process is often a process with little executive visibility and no direct linkage to the financial goals or the capital spending targets of the company. Personnel who develop business cases often lack context for how their projects fit into the company's overall financial targets. Without strategic guidance, they often go through the motions of developing business cases to satisfy a procedure and seek to prove the project has acceptable economics. As one Finance Director for a large public power entity lamented, "I've had engineers say, 'just tell us the required return to meet the cut off—we'll fill in the rest.'" In addition, in the absence of knowing the big picture, engineers feel obligated to defend all their projects rather than taking the view that some projects are of higher priority than others.

Lack of Direct Senior Team Involvement. Many companies rely only on a mid-management project review committee to evaluate the merits of a project. The Senior Team may only get involved as a business case is routed around for comments and signatures or during annual reviews of the project list. This indirect involvement results in a surface-level understanding of the project from the Senior Team with little or no meaningful interactions and deliberations among themselves (or the lead engineer) to identify and evaluate alternative approaches to projects.

This lack of scrubbing at the senior level leads to sub-optimal implementation of project alternatives from a technical and financial perspective. The lack of interaction and deliberation at the executive level can also result in a dysfunctional reverse pyramid risk structure for the organization. Without this interaction from senior management, the engineers often hold the perception they bear all the risk of their decisions. This burden often leads the engineers to devise and actively promote the solution with the most cushion and the least risk, which is almost always the most expensive option.

Lack of Rigor. Many business cases do not rigorously employ quantitative measures nor do they have adequate data to back up the request for funding. For example, business cases often lack historical failure rates of equipment or any evidence of industry experience with the equipment. This omission can prevent an accurate evaluation of cost and reliability and can result in suspect NPV calculations and conclusions. In addition to insufficient data, there is often little background information to encourage creative alternatives and allow meaningful deliberation.

Oftentimes, the business case becomes a check the box exercise, simply looking for a positive NPV, regardless of the validity of the assumptions behind it or whether more cost-effective solutions exist. As one Senior Vice President of a G&T said, "Our business cases can do a better job of laying out alternatives ... often, we only look at one option." A symptom of an ineffective and tired business case process is one that repeatedly accepts the base case solution and produces insignificant cost savings compared to the budgeted capital expenditures.

Lack of Risk Quantification. Most business cases identify and discuss risks, but do not quantify risks, such as incorporating the potential reduction of equipment failure rates into the benefits of a project. In addition, the financial analysis may rely on overly optimistic point estimates of construction costs and fuel savings, and aggressive reductions in forced outage rates. A single point estimate of project costs and benefits can provide the Senior Team a false sense of security that the project will deliver on its estimates. They have no understanding as to the probability of achieving the cost estimate for each alternative. This failure to systematically quantify risk makes it difficult for the Senior Team to succeed in its most important role—properly evaluating the cost-risk tradeoffs of a particular project.

“Our business cases can do a better job of laying out alternatives ... often, we only look at one option”

G&T Senior Vice President

Breathing New Life into Business Cases and the Project Review Process

To ensure the most cost-effective use of project spending, the business case development process must include complete and transparent financial and risk analysis; and the business cases must be visible to the Senior Team. A successful project review process requires clear roles, a link to overall spending targets, robust business cases and systematic project prioritization to better evaluate alternatives and cost-risk tradeoffs.

1) Establish the Roles. The Senior Team must have significant involvement in the process; project reviews cannot be delegated to a mid-management project review committee without executive oversight. For example, one public power entity saw a dramatic improvement in the quality of the business cases when the Senior Team asked the engineer to present directly to them. The responsibility associated with personally presenting business cases to the Senior Team gave engineers additional incentive for identifying the most cost effective alternatives and quantifying the risks of each alternative. Formerly, project approval included a “rubber stamp,” mid-management review combined with routing for executive signatures, without any first-hand executive discussion of the alternatives. The new process cut the average review cycle for each project by a month and resulted in a 35% reduction in spending with no expected loss in reliability.

Direct Senior Team involvement in the business case review provides essential oversight and drives the necessary analysis to provide transparency for more informed decisions. As one Senior Vice President of a major public power entity commented, “Evaluating business cases gives me a comfort level that we are spending our funds wisely and risks are taken with the full knowledge of the Senior Team.” This senior-level involvement flips the inverted risk pyramid into its proper position, making it clear to engineers that the Senior Team is addressing the risk. Thus, engineers for the project can focus on complete discovery of the facts and identifying creative alternatives.

A side benefit of Senior Team involvement is that business cases become an effective succession planning tool by getting all executives involved in discussing assumptions, and the costs and risks associated with major projects. One Vice President of Administration at a public power entity, who was initially unfamiliar with power plant operations, became much more knowledgeable of plant operations by getting involved in reviewing and approving business cases.

Providing the Senior Team with the best information possible is what makes the process work. However, in many cases, the lead engineer does not have the financial depth necessary to quantify and analyze alternative project solutions. As a result, a working group is often set up for each project, consisting of a lead engineer, other company experts and finance or business planning personnel who possess the financial skills to support the analysis. Engineers develop the background and cost estimates, while the finance or business planning personnel model the costs and utilize risk analysis techniques. The working group discusses the assumptions and the results, often leading to more optimal alternatives. Finance and business planning personnel who possess some engineering knowledge are valuable because they can talk the engineer’s language, think through alternatives and properly structure the financial analysis for each alternative.

2) Link the Business Case to Overall Project Spending Targets. Senior management must communicate clear objectives regarding the purpose of developing business cases. These objectives often include linking project spending targets to the

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business plan and financial viability targets, such as the equity ratio, cash liquidity targets and member rates. The purpose of developing business cases for proposed projects is to identify the most cost-effective alternative for meeting the project's intended goal. As one Senior Vice President of a public power entity said, "We have to discipline ourselves to differentiate between needs versus wants." Having a clear financial target for overall project spending is a critical ingredient to ensure fiscal balance.

One G&T Chief Financial Officer used the business case process and the expected savings to reduce a large anticipated financing need. As a result of the new process, the G&T's financing requirements for the next two years decreased by about a third, essentially acting as a new source of capital. Achieving overall financial targets provides the extra motivation for engineers and the working group to find the most cost-effective solutions. Similarly, at the individual project level, each project must tie directly to a known starting point for costs, such as the existing budget or latest business plan, with the savings calculated from that base.

3) Develop Robust Business Cases. When analyzing the effectiveness of a project

review process, companies rarely ask: Are the current business cases producing the most cost-effective solution and consequently, could we be paying too much for our desired reliability? Exhibit 1—Is Your Business Case Robust?—provides the key elements of successful business cases and a scorecard for evaluating whether improvements are needed.

Financial and risk analytic tools, combined with financial and engineering knowledge, can breathe new life into business cases. These tools are used to conduct sensitivity and breakeven analyses, translate failure rates into expected NPV results and conduct Monte Carlo risk analysis on key input assumptions. (Examples A and B, at the end of this paper, provide business case examples that highlight savings and cost-risk tradeoffs.) Successfully integrating probability and risk analysis into business cases was a giant leap forward for

Exhibit 1

Is Your Business Case Robust?
Calculate Where You Stand on Your Major Projects

Rarely	Some-times	Always	
This checklist provides the key elements of successful business cases for large projects.*			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. The background section is well documented in order to encourage senior level deliberation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Regulatory commitments are clearly documented with an associated timetable
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Failure rate assumptions are backed up by historical equipment failure rate data and documented industry or vendor experience
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Alternatives are creative (not just the base case and "do nothing") and are focused on saving costs
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. The costs of the alternatives clearly tie back to the existing budget or business plan in order to calculate savings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. The financial analysis shows the present value of each cost component and compares the NPV of the base case and all alternatives
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. The business case provides sensitivity analysis, including breakeven analysis related to key variables
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. The business case includes a Monte Carlo risk analysis to quantify risk (not just list qualitative risks) and calculate the probability of reaching the point estimates of the base case and alternatives
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. There is explicit discussions of cost-risk tradeoffs of various alternatives based on the financial and risk analyses
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Business cases are prepared in presentation form in order to encourage face to face discussion and deliberation

* The dollar threshold for what constitutes a large project varies by company.

Total Score: What the total points tells you about your business cases:

- 0-8 Ineffective
- 9-17 Need Improvement
- 18-20 Working Well

Scoring

- Rarely = 0
- Sometimes = 1
- Always = 2

Exhibit 2

Simplified Risk Analysis—Binomial Distribution

The binomial distribution (used here for a dual motor set) is useful in quantifying the financial risk from power plant equipment failures.

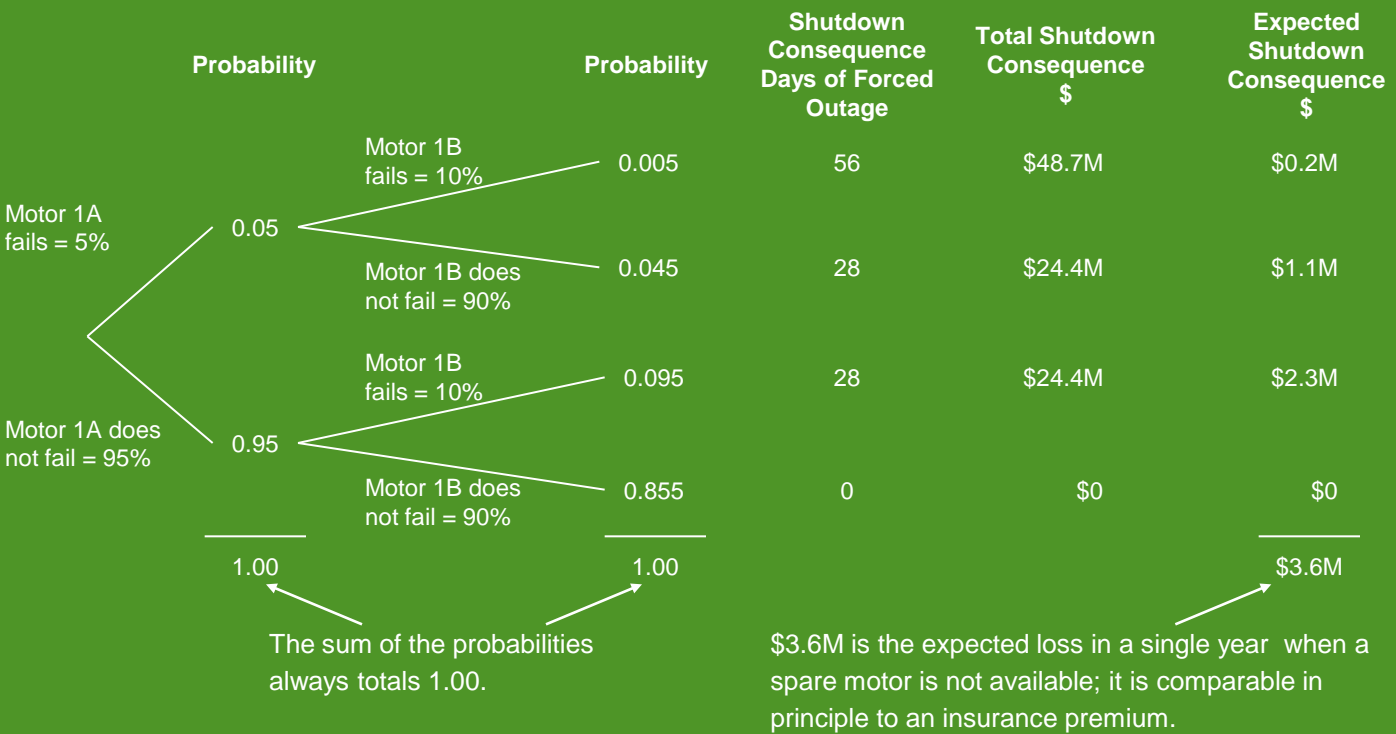
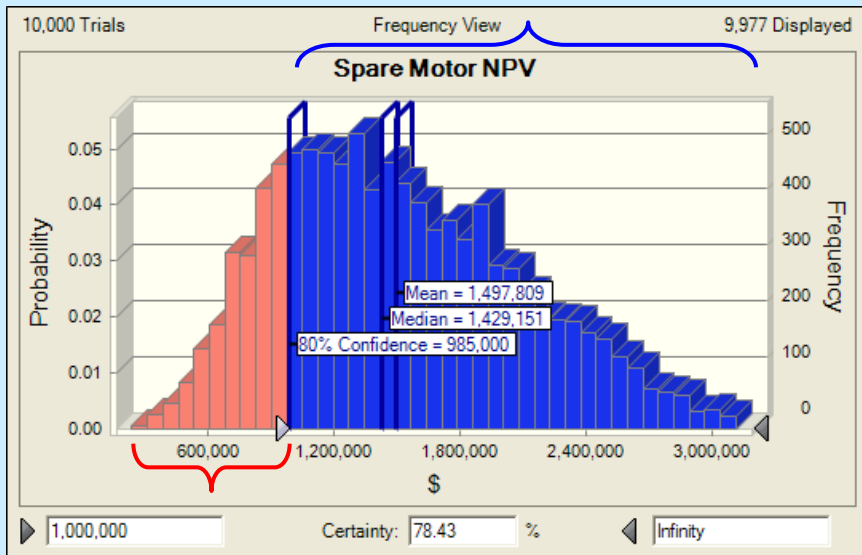


Exhibit 3

Simplified Risk Analysis—Full Life NPV Frequency Chart

78% confidence the NPV will be greater than the base case point estimate of \$1.0 million



22% chance the project NPV of \$1.0 million will not be met

This provides a confidence level or probability of achieving the NPV estimate.

In this case, there is a 78% confidence the point estimate of \$1.0 million will be achieved ... thus giving comfort to the Senior Team the project will achieve the stated results.

Note: The Monte Carlo Simulation utilized Oracle's Crystal Ball 7.3.1.

one large public power utility, which was reflected by the Chair of the Executive Review Team, “Quantifying risk has created an entirely new and more objective way for us to evaluate benefits and the cost-risk tradeoffs in projects.”

Engineers must be exposed to these financial and risk analysis techniques to increase their comfort in evaluating alternatives and presenting a business case to the Senior Team (see Exhibits 2 and 3 for sample techniques). However, since engineers typically do not develop enough business cases to become experts in the tools or financial concepts, they should develop the background and cost estimates for a project, and actively embrace the strengths of the working group and finance personnel. This team approach ensures more alternatives are evaluated and properly structured for comparative financial analysis. When all parties bring their strengths to the table, the working group produces the best recommendation considering both reliability and cost. One G&T Director of Finance commented,

The business case process has fundamentally changed the way we look at our business. We now have a tool and process to gain alignment and arrive at the right decisions. We have given senior management more information on alternatives, which enables them to ultimately decide how much risk they are willing to assume at various cost levels.

4) Prioritize Projects. Most utilities have more capital projects than they can afford and thus require a process for prioritizing projects in order to meet a capital spending target. An effective annual project prioritization process is a key to opening the door for additional capital savings. One method is to establish a project review committee consisting of the key directors and managers in the utility. Their role is to annually review the business cases developed earlier in the year for each project (assuming one exists) or review project write-ups in order to prioritize the projects within the capital spending limit. In preparation for the budget, this project review committee discusses the need for each project and the risks of not proceeding with the project in the upcoming year.

It is common in project prioritization meetings to categorize the projects into must do and discretionary using business case results and some form of rating method within each category. The project review committee discusses and ranks each project, ultimately placing them above or below the capital budget cut-line (go or no-go). The analysis from business case evaluations may give cause to re-think whether to proceed with a must do project in its present form or whether the economics of some discretionary projects justify them above the line.


The project review committee provides their recommendations to the Senior Team who goes through a similar but more abbreviated process. The Senior Team ultimately decides which projects to approve for funding in the following year, recognizing the need to achieve the capital spending target. A prioritized list of approved projects is then updated in the long range financial forecast. Unapproved discretionary projects are cancelled or placed in later years of the long range plan for continued monitoring.

Developing robust business cases throughout the year and presenting them to an active and engaged Senior Team are a key to making this annual prioritization process run smoothly, because the Senior Team will be familiar with the projects that have already been presented as business cases. Business case results provide the most insightful information for judging the true value of projects competing for limited funds. Generally the largest 5-10% of the projects comprise about two-thirds of the capital budget. A good project evaluation and prioritization process will produce detailed

An effective annual project prioritization process is a key to opening the door for additional capital savings.

business cases for the largest projects (e.g., top 10-20 projects) with the remaining projects scrutinized to a lesser extent as part of the annual prioritization process.

Getting Back on Course

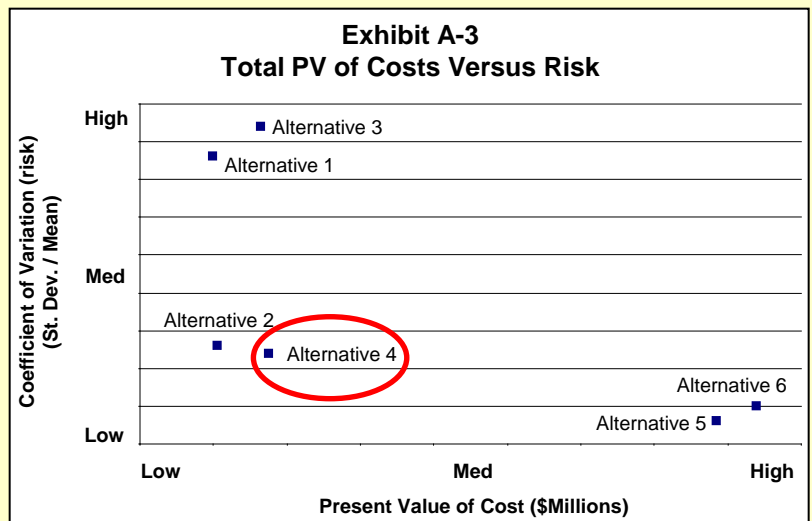
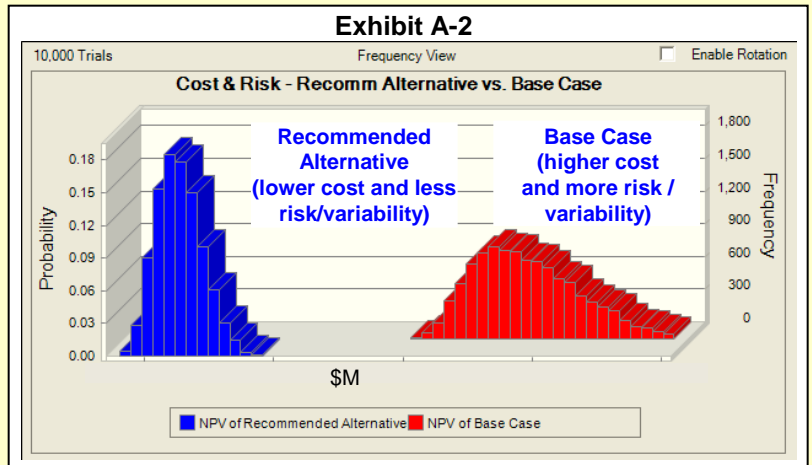
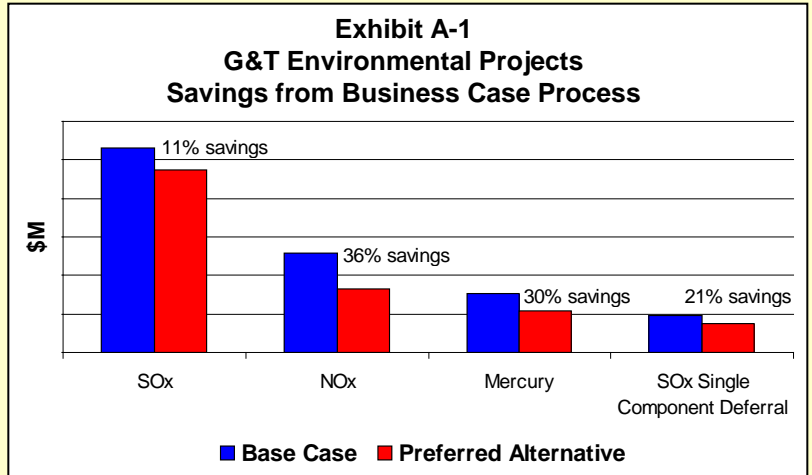
Completing business cases to evaluate proposed projects has been in place at many companies for many years. Over time, however, the process can lose its sense of purpose; today, many companies just go through the motions with business cases. Executives must reinvigorate the project evaluation process by requiring robust business cases to set the proper expectations and optimize project spending. Saving capital dollars in today's constrained financing environment effectively acts as another source of credit and provides an important financial cushion for the Senior Team in a volatile environment. The resulting savings can be large—usually 20-40% of today's capital budget. Achieving results of this magnitude requires a commitment by senior management to change the culture and breathe new life into business cases, but the payoff is substantial. 

Example A Environmental Strategy Evaluation

A G&T faced the challenge of meeting emission standards at the lowest cost while assuming an acceptable level of risk. The company was able to save tens of millions of capital dollars over the following five years on several environmental projects by instituting a new business case process. The weighted average percentage savings vs. the base case solutions was 21% on a present value basis (see Exhibit A-1).

The business case process involved establishing a working group for the environmental projects. For example, the NO_x working group identified alternatives to installing a new SCR (the base case), quantified the present value of the costs and benefits of the alternatives, and conducted Monte Carlo risk analysis to quantify the key risks. The risk analysis enabled the Senior Team to understand how sensitive the recommended alternatives and the base case were to changes to a group of risk variables. Senior management grew more comfortable that the recommended alternative of installing another type of emissions control equipment would meet the emission standards, was less costly than the base case and provided less variability or risk (see Exhibit A-2).

The business case process was also applied to other types of environmental projects (e.g., SO_x and mercury compliance) and was universally viewed as a success since it saved significant capital over the next few years for the G&T in a tight financing environment. Moreover, it gave confidence and piece of mind to mid-management, the Senior Team and the Board that all reasonable environmental alternatives were explored in an integrated fashion and the proper decisions were made from a cost-risk standpoint. (see Exhibit A-3).



Example B Transmission Line Rebuild Project

A public power client was experiencing increasing momentaries on a particular transmission line (see Exhibit B-1) and was trying to optimize its cost within an acceptable level of outage risk. The overall system average for momentaries had been improving, but this particular line was performing worse than the system average. The company had two alternatives: rebuild the line using a tangential rebuild or complete a full looped rebuild of the line. The tangential rebuild was expected to reduce the momentaries from about nine to four per year. The looped alternative was expected to cost about \$2.5 million more than the tangential rebuild and was expected to reduce the number of momentaries to about three per year (see Exhibit B-2). This cost-risk framework provided a context for the working group and the executive group to decide whether the expected improved reliability of the looped alternative was worth the incremental cost.

Exhibit B-1
Momentary Outages

—Illustrative—

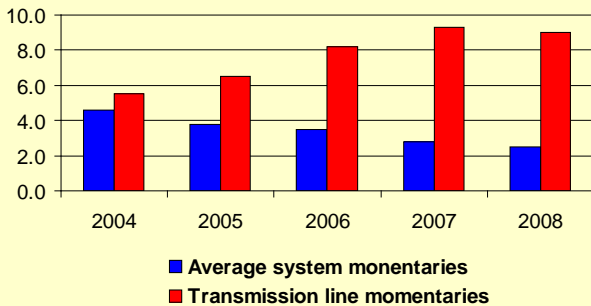
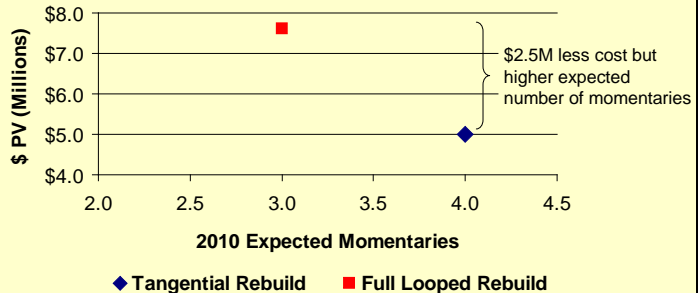


Exhibit B-2
Transmission Line Rebuild Project
Cost vs. Expected Risk of Momentaries

—Illustrative—



MCR and our clients jointly

developed business cases

identifying about

\$150 million in savings

from originally proposed

spending of about \$500 million.

The teams found, on average,

30% savings

for each business case.

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Frank is a co-founder and partner in MCR Performance Solutions. He has over 25 years experience working with G&Ts, IOUs, and municipals. Frank's expertise includes financial planning, budgeting, accounting, rates and revenue requirements, utility operations and information technology.

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