Risk-based asset replacement
For many North American utilities, it has been half a century since their massive postwar capital investment programs. Now, many of these critical assets—electric grids, natural gas pipelines and water distribution systems—require urgent replacement to maintain safety and reliability.

According to the Department of Energy, power outages cost the US approximately US$80b annually while the financial consequences of catastrophic failure can threaten a utility’s viability. Given the significance of this risk, utilities must supplement their traditional reliability-centered maintenance programs with two parallel activities:

1. A regulatory-accelerated replacement strategy
2. An operational risk management framework

North American utilities are being encouraged to think beyond compliance when planning for critical asset replacement. Taking a risk-based approach increases the likelihood of successful rate case applications while avoiding catastrophic asset failure. Matt Chambers reports.

Building a compelling case for investment

A regulatory-accelerated replacement strategy focuses on accelerating and prioritizing replacement and financial recovery, compressing what may have been a 50-year asset replacement plan into a much shorter period of, for example, 10 or 15 years.

Although fast-tracking asset replacement is essential to avoid failure of aging infrastructure, it also requires a far greater investment of funds. Utilities must build compelling, risk-based rate cases that assure regulators that this increased infrastructure investment aligns with the public’s need for reliable energy supply.

We believe that many regulators are aware of this pressing need for investment. But, wary of burdening consumers with continual rate increases, they are increasingly encouraging companies to present evidence of the investment need in order to justify costs that will be passed on to ratepayers.

The California Public Utility Commission (CPUC) recently proposed new rules that would compel utilities to base future rate case applications on a risk-based decision-making framework. The CPUC said it “expect[s] an evolution in the way utilities identify safety and reliability risks and justify the value of investments and operations expenses.” However it is worth noting that many regulators, including the CPUC, have yet to update cost recovery mechanisms in line with this risk-based approach (see inset box).

This evolution requires utilities to build a compelling case for investment by articulating their risk profile and creating awareness of the risks and mitigation plans. We are working with many companies to develop critical asset risk and investment plans that use both the current risk profile and proposed risk profile that would result from the replacement program to quantify the potential financial consequences of a potential asset failure.

Using data analytics to improve operations

In addition to prioritizing asset replacement, utilities need better ways to manage the short-term operational risk associated with aging assets. Most companies have an effective operational management framework in place, but in many cases, this framework includes inadequate monitoring and reporting mechanisms to alert management to signs of potential asset failure.

Given the significance of the risks, warning signs of potential failure must go beyond frontline operational staff. Executive management needs a clear line of sight into operational decisions to enable proactive decision-making when it comes to failing assets. Embedding advanced data analytics into existing enterprise asset management (EAM) systems allows for greater transparency and improved reporting. This means utilities can understand not only what has already occurred, but also why it happened and what may be lurking around the next corner.

Living on borrowed time

Utilities, and society at large, are living on borrowed time. The economic and public impact of a single, major infrastructure failure far exceeds the positive returns that risky assets left in the ground stand to provide. While reliability-centered maintenance programs remain important, utilities will also need to adopt a multifaceted solution that considers regulatory-accelerated replacement and operational risk. Most importantly, avoiding catastrophic asset failure will require companies to view asset replacement programs through a risk lens that enables proactive, long-term decision-making, rather than one that focuses only on compliance.

Lessons from San Bruno

PG&E’s risk-based replacement strategy

Californian utility Pacific Gas & Electric (PG&E) – owner of the San Bruno gas pipeline that exploded in 2010 – recently conducted risk assessment that led to changes in the company’s planned investment priorities in order to improve safety by optimizing risk reduction.

Announced on 30 October 2013 as part of the company’s third-quarter financial earnings, the utility announced plans to replace fewer miles of natural gas pipelines than originally proposed, although the difficult terrain in which these miles are located means the costs to replace them will be comparable. But with CPUC’s cost recovery mechanism based on number of miles, rather than the cost of replacement, PG&E stated that the work would leave it with unrecoverable expenses of about US$196m (with additional costs of US$30m in 2014). This highlights the need to educate regulators as to the true cost of replacing infrastructure and putting legislative measures in place to ensure utilities do not bear all the expenses of a risk-based replacement strategy.

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Matt is a Principal in Ernst & Young LLP’s Advisory practice with almost 20 years of experience assisting clients with improving their risk management infrastructure. He leads the US firm’s performance risk management activities in the power and utilities sector and works with a number of energy clients in designing and implementing policies, processes and technology to manage the significant strategic and operational risks that impact long-term goals.

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