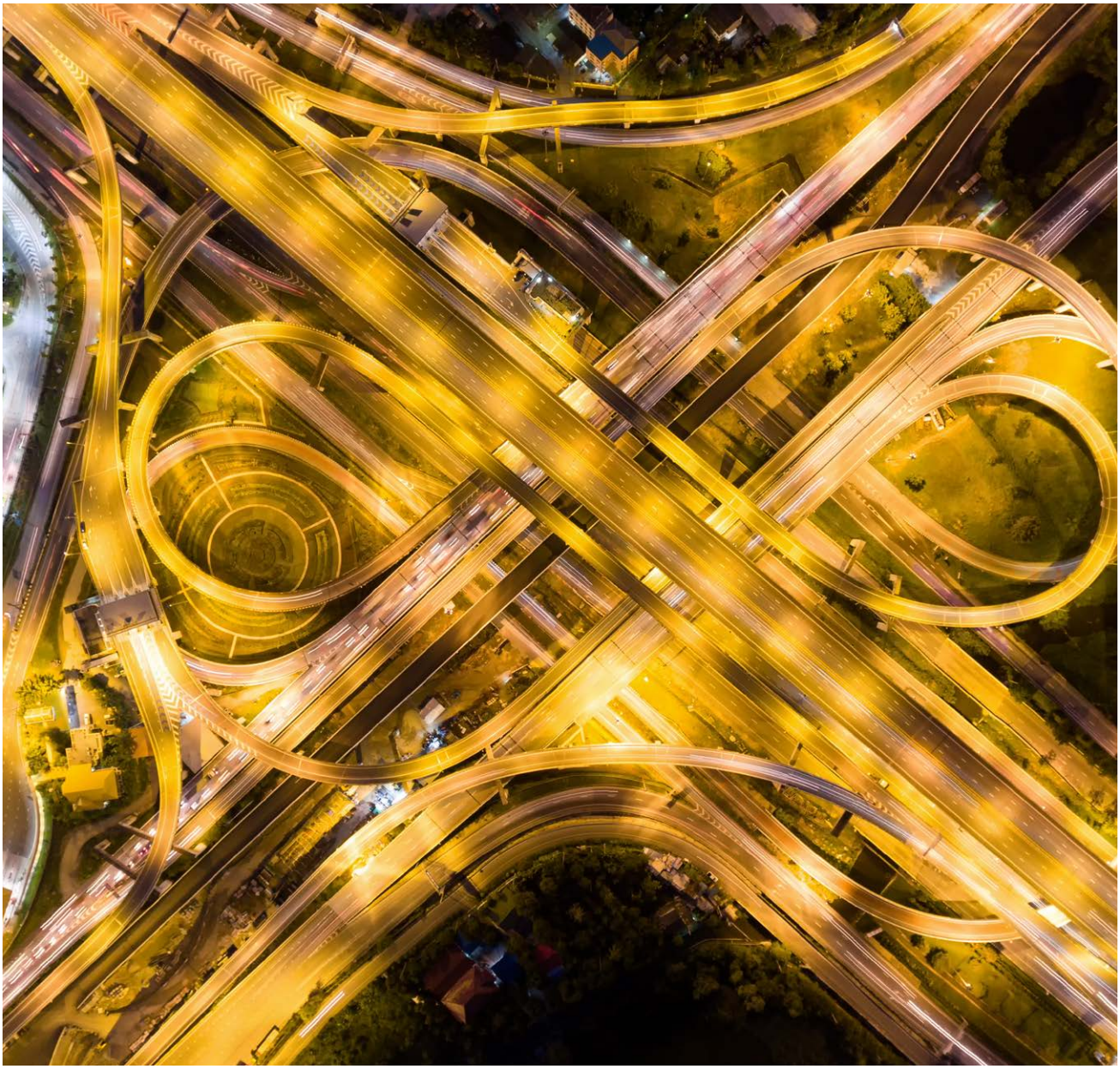
MARSH



# Removing Bias from Decision Making in the Energy and Power Industry



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# EXECUTIVE SUMMARY

Risk management practices have changed dramatically over the past few years, with the transformation expected to continue at a much faster pace in the next decade. In recent years, one trend that has contributed to this transformation is debiasing. Bias often operates subconsciously, and has the potential to negatively impact risk decision making. This can have an effect on the overall risk levels of an organization, and ultimately its bottom-line.

Training on its own is not an effective long-term solution to mitigate the influence of bias on risk decisions. Experts believe analytical tools are more effective in debiasing high frequency risk decisions.[1] Risk quality benchmarking tools can be useful in reducing potential biases, which could positively influence how insurer's select specific risks for underwriting.

Furthermore, benchmarking facilitates strong risk differentiation and potentially benefits operating companies in helping to attract competitive insurance rates, terms, and conditions. Removing biases through benchmarking, perhaps resulting from individuals' own personal background and previous industry experience, also helps operating companies drive rational data-driven investment decisions that are more accurately based on overall performance, industry trends, and risk quality.

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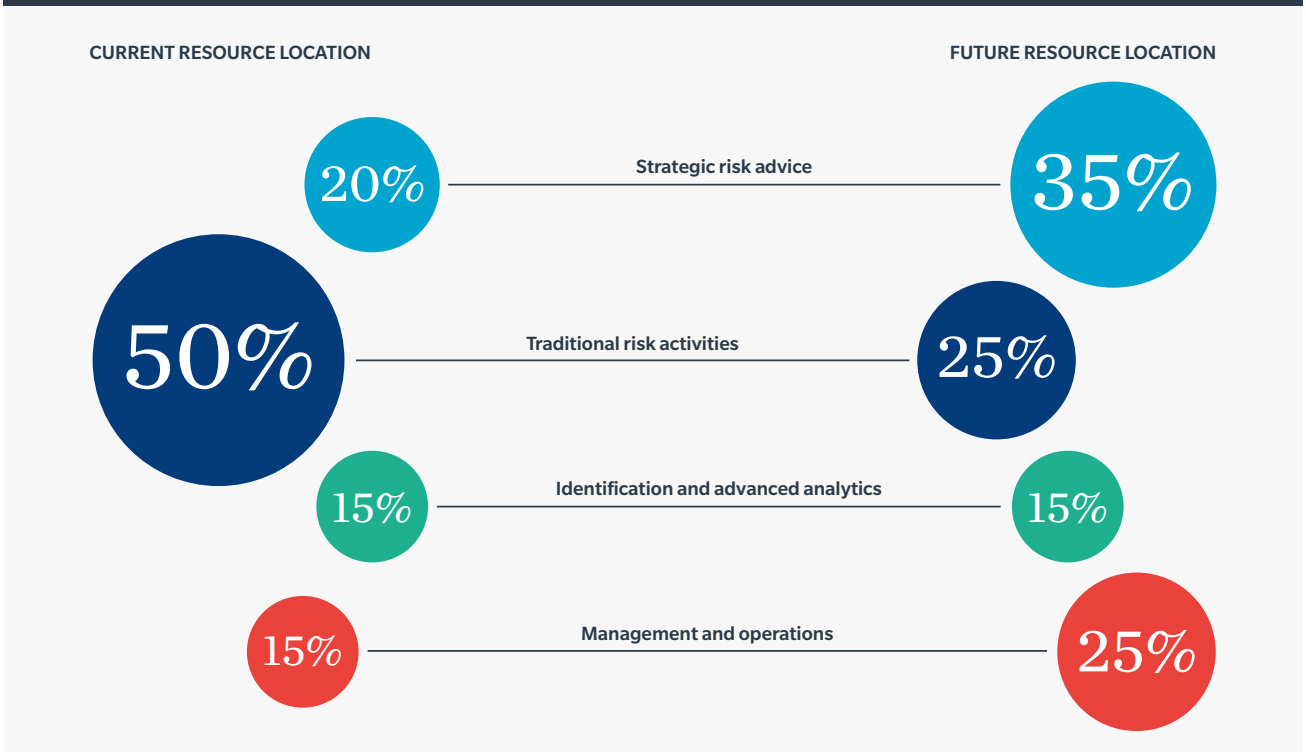
# THE PACE OF RISK MANAGEMENT CHANGE IS INCREASING

Risk management practices and the ways we look at them have changed significantly over the past several years. This evolution has been driven by the 2008 financial crisis, high-profile catastrophes, the growing impact of cyber-attacks, a shifting geopolitical risk landscape, Brexit, and more. According to Oliver Wyman,[2] the past 10 years have seen a radical overhaul of risk management, with financial recovery and regulatory compliance the main drivers for change. Such changes will require the skills of the next generation's risk management functions to be very different, with focus shifting away from traditional activities towards analytical and advisory skills, as shown below in Figure 1.

The transformation in risk management is expected to continue. Based on recent research,[3] it is expected that the next 10 years will see even more changes than in the past decade, with the transformation largely driven by structural trends, such as digitization and regulation. A further trend expected to contribute to this transformation is debiasing. In the context of risk management, this refers to a variety of techniques, methods, and interventions that are designed to improve people's judgement and risk decision making. Biased judgment and decision making is defined as "that which systematically deviates from the prescriptions of objective standards such as facts, logic, and rational behavior or prescriptive norms."

A trend expected to contribute to this transformation of risk management is debiasing.

**FIGURE 1** Future Risk Management Functions Will Need More Analytical and Advisory Skills
Source: Oliver Wyman



# REMOVING BIAS FROM DECISION MAKING

Debiasing aims to help organizations and their decision makers mitigate the influence of bias on risk decisions, which often operate subconsciously. We tend to consult our personal feelings about a decision before being able to make such decision. In a survey[4] of 800 board members and chairpersons, respondents ranked "reducing decision biases" as a priority area for improvement. Bias can be costly, and multiple biased decisions can have a cumulative effect on the overall risk levels of an organization, and, ultimately, its bottom-line. Various industries are beginning to apply techniques for overcoming biases. Companies that have focused on achieving debiasing have seen noticeable performance improvements; it is reported that by debiasing high-frequency decisions such as those in insurance underwriting, theralready been significant improvements in performance.[5]

Executives concerned with improving the quality of their decision making process often first turn to training, including unconscious bias and other relevant behavioral training. However, given the full complexity of biases that can be embedded deep in our thought processes, designing alternative decision making processes and targeted interventions is believed to produce a more effective solution. A study by decision scientist Baruch Fischhoff[6] showed that bias improvement through training is generally short lived and does not produce significant results.

A German power company recently undertook a major debiasing operation after several disappointing investments. This included making it mandatory to list the debiasing techniques that were applied as part of any major investment proposal put before the board.[7]

Experts believe that analytical tools can also be particularly effective in debiasing high-frequency decisions and suggest three decision debiasing techniques,[8] as shown in Figure 2. The aim is to replace intuitive reasoning with a formal analytical process.

A key, high-frequency decision related to the insurance underwriting sector is risk selection. Ranking risks in order to evaluate their risk quality can not only support loss prevention, but also enable insurers to more accurately price those risks they choose to take on. Such tools are typically unbiased by design, as it converts the judgement of the risk engineer into consistent, objective, and practically quantitative data across hardware, software (or management systems), and emergency control features. This provides the decision makers (in this case, insurance underwriters) with fact-based inputs and an independent view.

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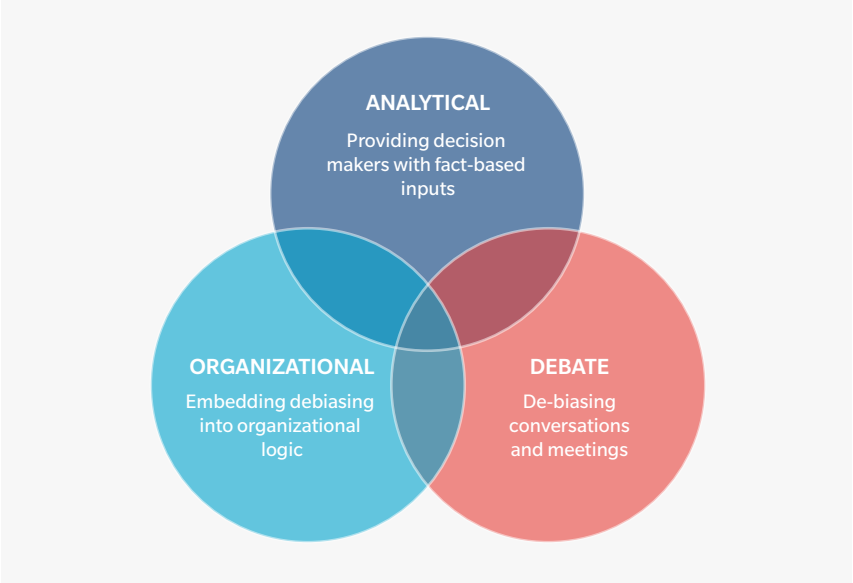
# REPLACE INTUITIVE REASONING WITH FORMAL ANALYTICAL PROCESS

However, it is recognized within risk ranking that there is still some room for bias (in particular interest or social biases[9]), be it to a specific operating company, industry, or region. A general problem with debiasing is that "the same kinds of biases that distort our thinking in general also distort our thinking about the biases themselves,"[10] that is, believing that we ourselves are not prone to bias. This is also known as overconfidence bias. Benchmarking has been identified as a means to mitigate the influence of biases. Presenting risk quality evaluations (that is, the results of risk ranking) against that of industry peers (as shown in Figure 3) can encourage unbiased perspectives that ultimately support risk selection and differentiation and business decisions that are not skewed by recognized or unrecognized biases.

Benchmarking is a useful tool for energy and power operators. In certain territories, such as the Middle East, there tends to be a large influx of employees from different backgrounds. Owing to an individual's professional background, there is the potential to develop emotional attachment to individual elements, creating a misalignment of interests. A senior manager with a maintenance background, for example, may favor and promote investments towards maintenance improvements, even if at the expense of the overall interest of the company. Benchmarking informs rational investment decisions based on overall performance, industry trends, and impact on risk quality.

Benchmarking means that one company is ranked as better and another must be ranked as worse. Therefore, this can be used to highlight discrepancies and identify if there are biases present in a dataset and addressed appropriately. Carrying out local population comparisons, for example, can be used to remove or understand bias of particular engineers, technologies, etc. Periodically rotating the surveying risk engineer is another technique used to manage and reduce the risk of biases.

**FIGURE 2** Three Decision Debiasing Techniques
Source: McKinsey




Benchmarking presents an operating company/site's risk quality performance across all topics evaluated and scored, as seen in Figure 3. Topics are weighted based on their relationship to loss prevention and risk management. Interest biases, however, as explained earlier, could cause one to develop attachment to certain topics. Focusing only on an individual risk quality topic such as inspection/asset integrity management in isolation could potentially result in other poor or good performing areas being overlooked.

It is only by looking at risk quality across the full suite of evaluated topics that a more accurate representation of the risk profile can be gauged. Looking at the full suite of risk quality topics also enables risk managers or board members to have a better unbiased understanding of overall comparative risk quality, and therefore make informed decisions around targeted improvements.

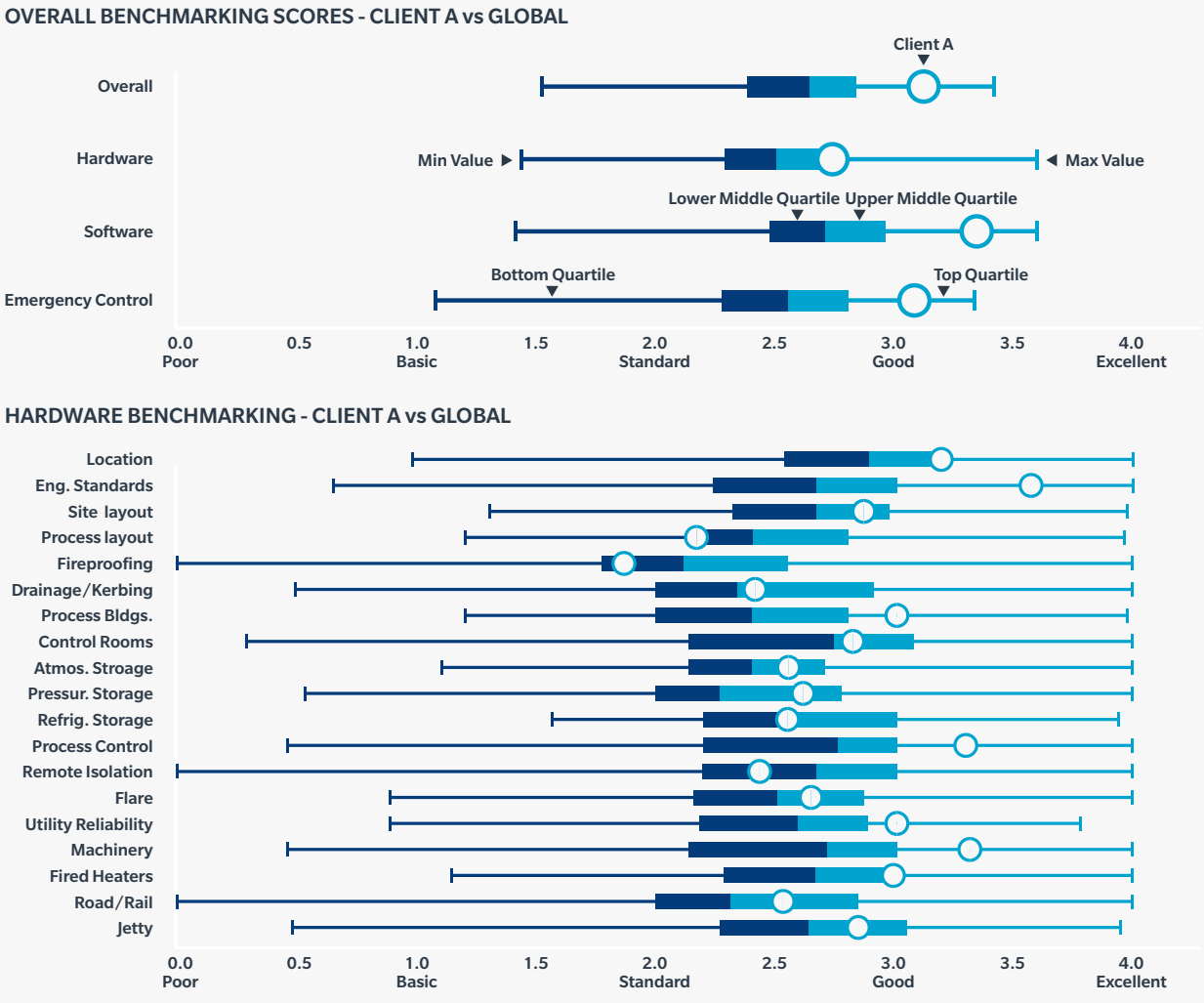
Trend analysis is a well-known technique used in performance monitoring and decision making processes. However, care should be taken not to fall within the trap of selection, in which trends or conclusions are drawn from incomplete and unrepresentative datasets.

During World War II, Abraham Wald, a professor in statistics and a member of the Statistical Research Group, was required to apply his statistical skills to various wartime problems.

A particular problem he worked on, which demonstrates how susceptible we are to selection bias, was to examine the distribution of damage to aircraft to provide advice on where to reinforce aircraft to minimize bomber losses to enemy fire. Certain parts of the aircraft appeared to be hit more often than others. Military personnel concluded, naturally enough, that these are the parts of the aircraft that need to be reinforced. Wald, however, came to the opposite conclusion. He argued that aircraft that were hit in a critical area were not likely to return, and that aircraft that returned despite being hit by enemy fire probably was not hit in a critical area, therefore reinforcing those parts was not likely to pay off. Wald instead proposed that the Navy reinforce the areas where returning aircraft were intact, since those areas, if hit, were more likely to cause the aircraft to be lost.[11]

When comparing business performance, or, in the context of energy and power, risk quality, it is only when looking at the entire spectrum that one can identify what separates companies with excellent risk quality performance from lesser performing companies. Relying on samples that are not representative of the whole population is risky, because any relationships inferred between management practice and success could be misleading. For example, by looking only at operators with a good reputation based on insurance claims history, it cannot be determined whether the current situation is really driven by good risk management practices or merely by past performance or good fortune. Risk quality benchmarking looks at the entire spectrum, including an extensive database of risk ranking scores

**FIGURE 3** Sample Marsh Risk Quality Benchmarking Output Comparing Operating Company A vs Global Population of Energy Facilities
Source: Marsh



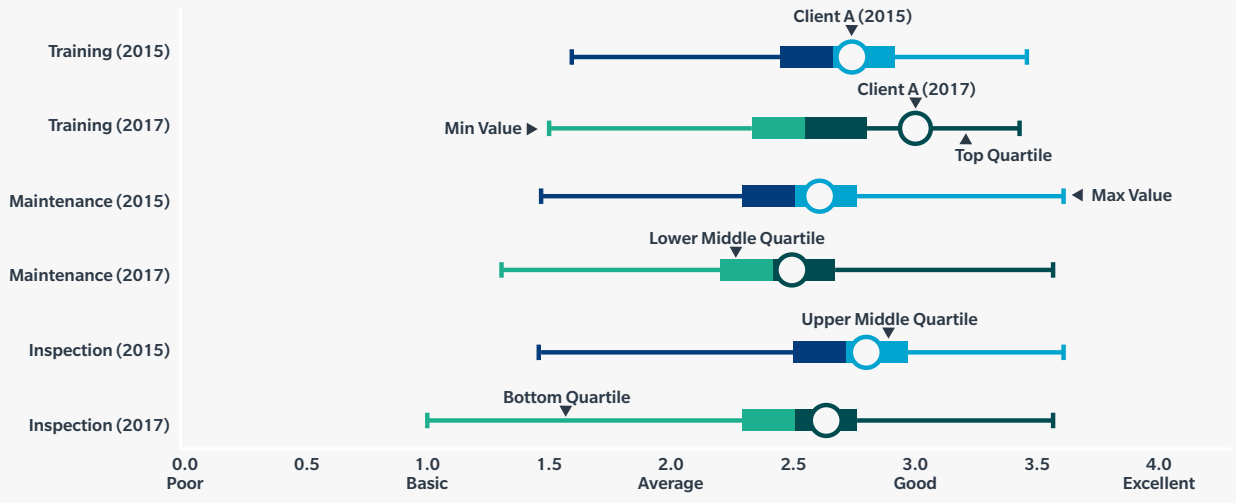
from energy and power facility operators globally, and therefore avoids decision makers from being subject to the risk of selection bias. This also gives more confidence to the reliability of the data. Operators that have historically been regarded as a less promising risk to write, due to, for example, claims history, could benefit from insurers having a better understanding of their relative risk quality, which could lead to underwriters viewing and writing these risks more favorably.

Retrospective benchmarking also allows risk decision makers to understand which areas performance is deteriorating versus peers. For example, a lower oil price has meant that many operators have needed to cut costs aggressively. In some cases, this has had unfavorable effects on key risk management topics such as operational strength (manpower levels) and training, maintenance budgets, inspection program execution, compliance with international design standards, employee morale, and, as a result, poorer implementation of risk management practices. Benchmarking would not only show such trends within peer groups, but would also enable identification of operators that have either followed or stayed ahead of such trends, therefore supporting informed risk selection.

From Figure 4, it is evident that, in two out of the three topics evaluated, Operating Company A has followed a decreasing trend in risk quality and implementation of risk management practices. On the other hand, operating companies that can demonstrate that they are able to improve despite decreasing global industry trends can potentially use benchmarking to help negotiate better insurance rates, terms, and conditions.

Retrospective benchmarking also allows risk decision makers to understand which areas performance is deteriorating versus peers.

**FIGURE 4** Sample Retrospective Risk Quality Benchmarking Output: Operating Company A vs Global Population of Energy Facilities
Source: Marsh



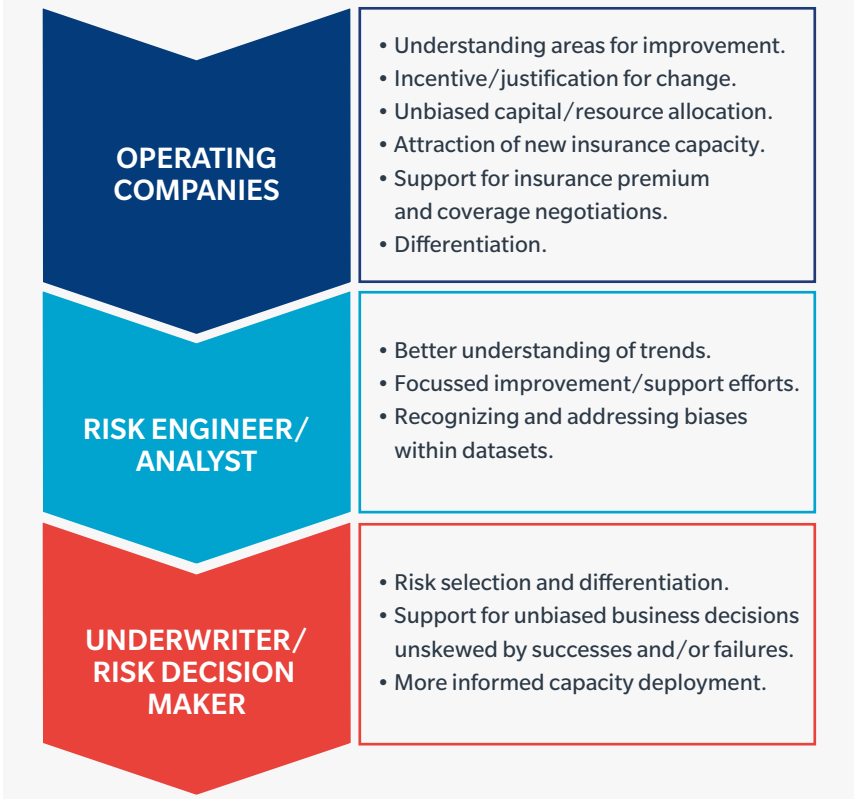
Risk decision makers are also vulnerable to the risks of stability bias and confirmation bias. The former is an underestimation of the potential to learn and includes an overemphasis on the current memory state.[12] The latter is the tendency to interpret information in a way that confirms one's pre-existing beliefs.[13] During an experiment,[14] participants were presented with evidence to counter their political beliefs. One interpretation of the results is that the brain signals threats to deeply held beliefs in the same way it might signal threats to physical safety.

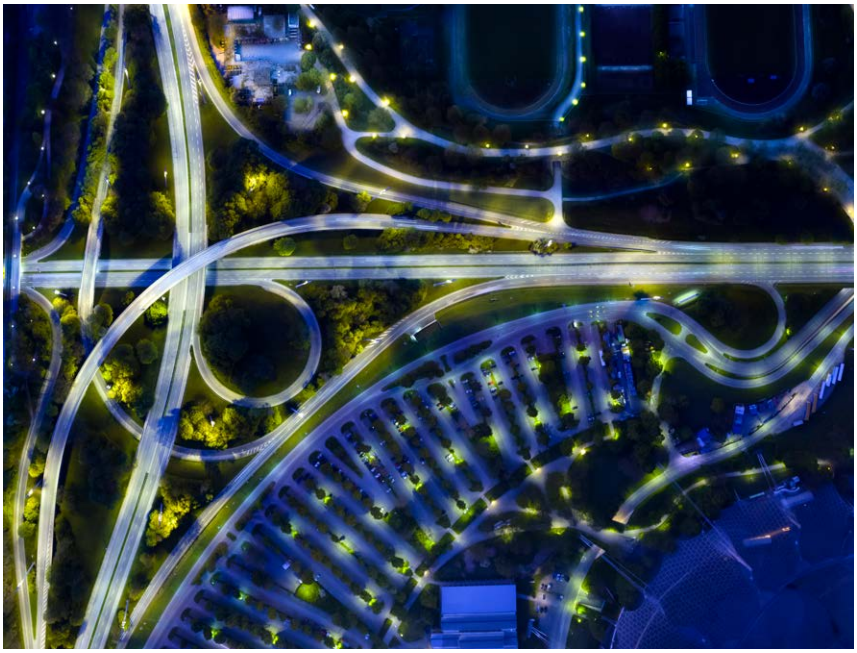
Too often, operators underestimate the value of learning from the incidents and losses of others because it has never happened to them during the entire operating life of the plant. Discussions about potential improvements are sometimes clouded by the tendency for people to get defensive because of stability and confirmation bias. For example, comparing established working practices (such as permit to work) with those of global peers that have had incidents is a powerful way of supporting discussions about the need for improvement.

In another example of stability bias and confirmation bias, a technical engineer coming from a refining background could be biased towards design standards that are typical for refining operations. Owing to our biased nature, it may be difficult to accept that different standards are used in different industries. Peer comparison supports data-driven discussions, presenting an unbiased picture of actual industry standards and good practice.

As outlined in Figure 5, benchmarking supports balanced, unbiased, rational, and data-driven decision making, benefiting not only insurance underwriters, but also operating companies.

**FIGURE 5** **Benchmarking with Industry Peers Provides Benefits Extend Beyond the Operating Company**
Source: Marsh



# CONCLUSION

Marsh recently carried out a survey of energy insurance professionals. The results revealed that:

- Nine out of 10 insurance professionals think they are above average drivers.
- Five out of six insurance companies believe they are the best at technically assessing energy risks.
- Nine out of 10 insurance companies believe they have the best underwriting leadership credentials.

Like humans, businesses are not immune to the effects of various biases. Biases often operate subconsciously, can act as barriers to rational decision making, and represent a significant risk to any organization. Debiasing should be a priority for risk management functions and decision makers given its potential bottom-line impact.

Within energy and power insurance underwriting, benchmarking potentially has a large role in making risk selection an objective process. Benchmarking is as an effective means of mitigating recognized and unrecognized biases, such as confirmation, stability, and selection biases, which have the potential to adversely influence risk selection decisions. It enables a more holistic view of an operating company's risk quality and more balanced, rational, and data-driven decisions.

Operators using this can benefit from clarity on risk quality, clear differentiation, and better deployment of insurance capacity, which can often assist brokers in negotiating a better deal or attracting new capacity for insurance cover. In addition, benchmarking can help operating companies justify investment and capital expenditure in the correct areas, without the risk of biased decisions due to personal attachments or biases to certain elements of the business.

# GLOSSARY

| TERM | MEANING |
|---|---|
| Ranking | A numerical assessment on a scale of 0 to 4 of designated features. |
| Hardware | The category that describes the relevant physical aspects of the risk, such as plant and equipment. |
| Software | The category that describes the relevant management and procedural aspects of the risk. |
| Emergency control | The category that describes the fire, explosion, or other emergency mitigating or aggravating features of the risk. |
| Category | Hardware, software, and emergency control. |
| Topic | An element or sub class of a category that covers one relevant underwriting risk assessment aspect. |
| Feature | An element or sub class of a topic that is given a ranking number. |
| Interest biases | The presence of intersecting interests (financial, personal, etc.), which could potentially affect personal judgement and decision making. A set of circumstances that creates a risk that professional judgement or actions regarding a primary interest will be unduly influenced by a secondary interest. |
| Social biases | A type of response bias in which surveyors or respondents have a tendency to answer questions (or rank risks) in a manner that will be viewed favorably by others. It can take the form of over-reporting good risk quality or under-reporting poor risk quality. |
| Overconfidence bias | A type of bias in which a person's subjective confidence in his or her judgements is reliably greater than the objective accuracy of those judgements. |
| Selection bias | This type of bias is introduced by the selection of data for analysis in such a way that proper randomization is not achieved, thereby ensuring that the sample obtained is not representative of the population intended to be analyzed. |
| Stability bias | The human tendency to act as though one's memory will remain stable in the future (that is, overestimating remembering). |
| Confirmation bias | The tendency to search for, interpret, favor, and recall information in a way that confirms one's pre-existing beliefs or hypotheses. |

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