

# Rolls-Royce avoids a reputation storm

When problems began to emerge with some of its aircraft engines, Rolls-Royce faced a potentially damaging reputation issue. There are good reasons why this does not appear to have materialised

By Nir Kossovsky

On 4th January 2011, an anonymous poster left an ominous message on Answers.com. The person asked, "Is the Rolls-Royce Trent 900 engine safe?" Why the question?

Well, it all started in late 2010. On 4th November 2010 a Qantas airlines flight between Singapore and Sydney was forced to turn back and make an emergency landing after an explosion in one of the aircraft's Rolls-Royce engines. The force of the blowout damaged the body of the aircraft, an Airbus A380, and scattered debris across an Indonesian town below. The next day, a second Qantas flight comprising a Boeing 747 and the same Rolls-Royce Trent 900 engine had to return to Singapore. Three days later, Qantas reported that it had found oil leaks which were "beyond normal tolerances" in Trent 900 engines on three additional aircraft.

That same day Robert Cole, writing for Reuter's Breakingview, noted: "Rolls is a business built upon its ability to forge awe-inspiring technology from plain metals. But it trades to a large extent on its reputation for the reliability of that technology and the sturdiness of the metals it uses." This article explores the intersection of the intangible assets of quality, safety and innovation as they underpin "reliability"; their role in modulating reputation and enterprise value; and the benefits of robust risk management systems in protecting that value.

## Rolls-Royce

You may think cars or jet engines, but Rolls-Royce Group plc would have you know that it is a US\$19 billion integrated power systems company, delivering reliable power that is "mission critical" to its customers. Operating in civil and defence aerospace, marine and energy markets, the company serves customers in more than 120 countries. It is a global provider of defence aero-engine products and services, with 18,000 engines in service for 160 customers in 103 countries. Its marine business has more than 2,000 customers and equipment installed on more than 30,000 vessels worldwide, including those of 70 navies. The company's energy business is a supplier of power systems for onshore and offshore oil and gas applications.

Rolls-Royce's largest operating segment is civil aerospace, where its products power more than 30 civil aircraft types, from small executive jets to the A380 super-carrier. This segment commands about 34% of the global market and a 64% share of the Boeing 787 and Airbus A350 family of airframes. Its installed thrust in 2009 added up to 367 million pounds (lb) and its services business had 59% of the civil aviation fleet under management.

## Trent 900 engine

The Rolls-Royce Trent 900 engines power the world's largest airliner, the Airbus A380. The engine has a baseline take-off thrust of 70,000 lb and is certificated up to 80,000 lb from the same bill of material. In testing, it has been run up to 93,000 lb thrust. Remember these values for later.

Its development was first announced in 2001 and its design incorporated lessons gained from 30 million hours of experience with prior Trent family members. It powered the first flight of an A380 in April 2005 and entered into commercial service

Table 1. There are six key business processes (intellectual properties) that create, preserve or restore reputation value

<b>Create an ethical work environment</b>	Ethics are the moral principles by which a company operates; integrity is the act of adhering to those moral principles. Ethics are an integral part of governance that combine with integrity to affect the reputation value of all other intangible assets. Additionally, ethics are the keystone intangible asset because they form the basis for trust and confidence.
<b>Drive innovation</b>	Innovation is the design, invention, development and/or implementation of new or altered products, services, processes, systems, organisational structures or business models for the purpose of creating new value for customers, and financial returns for the firm.
<b>Assure quality</b>	Quality is: <ul style="list-style-type: none"> <li>• The extent to which a product is free from defects or deficiencies.</li> <li>• The extent to which a service meets or exceeds the expectations of customers or clients.</li> <li>• The extent to which products and services conform to measurable and verifiable criteria.</li> </ul>
<b>Uphold safety</b>	Safety is the state of being certain that a set of conditions will not accidentally cause adverse effects on the wellbeing of people or the environment.
<b>Promote sustainability</b>	Sustainability means making, using, offering for sale or selling products and services that meet the needs of the present without compromising the ability of future generations to meet their own needs.
<b>Provide security</b>	Security is the degree of protection a company offers against events undertaken by actors intentionally, criminally or maliciously, for purposes that adversely affect the firm. Because fear is the great disruptor of life and commerce, it is useful to think of security, the most ethereal of the intangible assets, as “absence of fear”.

Data source: *Mission: Intangible. Managing risk and reputation to create enterprise value* (IAFS, 2010).

with Singapore Airlines in October 2007.

On paper, the Trent 900 is the lowest-risk solution for the A380. Because of the experience with its predecessors, it is the most mature from an engineering perspective. It is also transportable in fully assembled form, as it is the only engine capable of powering the A380 that will fit into the hull of a 747F. Additionally, it is also the most fuel efficient and is rated the lowest in terms of nitrogen oxide emissions.

After-market risk management is evident in its design and operation. The tiled combustor reduces emissions, enabling the Trent 900 to adhere to all current and proposed environmental legislation. In addition, the engine is equipped with an advanced predictive maintenance system to reduce maintenance disruption and improve time on-wing.

### **Risk and reputation management**

Delivering mission-critical power is a serious responsibility when it keeps commercial aircraft aloft. Seen from another perspective, loss of power in, say, an A380 super-carrier endangers the lives of 525 passengers in a typical three-class configuration, or up to 853 passengers in an all-economy class configuration, plus crew.

Rolls-Royce understands this responsibility and has developed systems to address relevant risks. The company’s asset preservation policy acknowledges the priority of the three greatest things it is protecting: reputation, viability and profitability.

### **Sources of risk**

The principal risks facing Rolls-Royce reflect the global nature of the business and the competitive and challenging business

Figure 1. Steel City Re Corporate Reputation Index ranking over the trailing 12 months, with overlays comprising the corresponding return on equities for Rolls-Royce, the median of the 14-member aerospace and defence sector and the S&P500 Composite Index. In this image, the significant finding is the narrowing of return on equity spread between Rolls-Royce and its peers since the events of 4th and 5th November

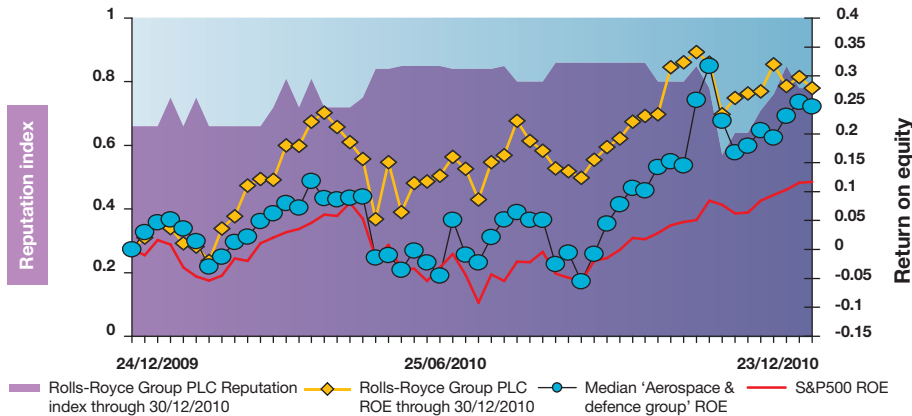
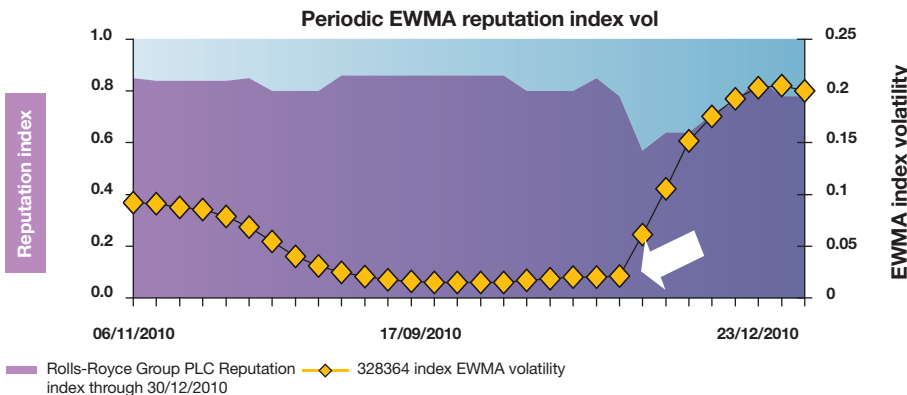


Figure 2. Rise in the exponentially weighted moving average Steel City Re Corporate Reputation Index volatility for Rolls-Royce over the trailing six months superimposed on the trailing six months of the Index proper. Arrow marks the close of trading on 4th November.



environment in which the company operates. Reputation risk is foremost, as its annual report emphasises: “Risks, including those to the Group’s reputation, are considered under four broad headings:

- Business environment risks
- Strategic risks
- Financial risks
- Operational risks.”

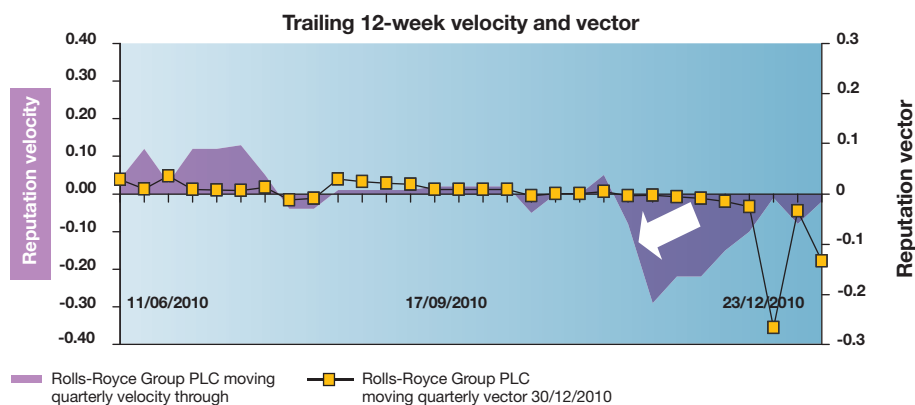
Were this article a conventional discussion of Rolls-Royce’s risk, it would centre on financial risks; and were it a broadly based conversation, it would address all four categories defined by the company in its 2009 annual report. But this article centres on a reputational crisis

arising from a quality/safety issue (and is written for the readers of *IAM* magazine), so we’ll cut right to a discussion of the six principle intangible assets that underpin reputation: ethics, innovation, quality, safety, sustainability and security (Table 1).

Ethics at Rolls-Royce is categorised as an operational risk. The company has an enlightened understanding of operational risks and recognises the benefits derived from conducting business in an ethical and socially responsible manner. Under the ethics rubric, the company also acknowledges aspects of sustainability risks.

Ethics and sustainability principles apply broadly at Rolls-Royce, from the sourcing of raw materials and components to the

Figure 3. Derivative parameters of the Steel City Re Corporate Reputation Index, trailing 12-week vector and velocity, highlighting the negative trends in Rolls-Royce's metrics since 4th November.



manufacture and delivery of products and services in all of its global locations and markets. They also apply to the provision of a safe and healthy place of work and investment in technologies to reduce the environmental impact of the company's products and operations. To the extent that regulations may arise to control the impact of products and operations on the environment and global warming, Rolls-Royce also categorises sustainability risks under the general rubric of business environment risks.

Rolls-Royce is well aware of the downside aspects of these risks: "Shortcomings in any of these areas could damage the Group's reputation, expose it to financial penalties and disrupt its business."

Quality and innovation are operational risks that fall under the heading of supply chain performance risks. Rolls-Royce manufactures approximately 30% by value of its gas turbine products, with the remainder being provided through external suppliers, including risk and revenue-sharing partners. Much more on this later.

The primary security risk involves information technology. The company engages in heavy data transmission whose content may be corrupted. Then there is "the possibility of unintentional loss of controlled data by authorised users". In either case, whether accidental, negligent or malicious, data losses are properly expected to have an adverse impact on operational effectiveness, the value of intellectual property, legislative compliance or the reputation of the company.

#### Risk management process

Rolls-Royce, the second largest maker of aerospace engines behind General Electric, is an engineering firm, and is acclaimed by

many in the community for its technical acumen. It maintains strong controls both internally and over how its supply chain operates. The *Financial Times* quoted the head of one long-term supplier in December as saying: "I think of Rolls-Royce as a rather fussy mother hen."

"Auntie" – the name by which the firm is known to many of its suppliers – has been badly bruised by the Trent 900 explosion. Again, from the *Financial Times*: "The managing director of one company that has supplied key components to Rolls-Royce for more than half a century says that inside the company there is a 'sense of shame'."

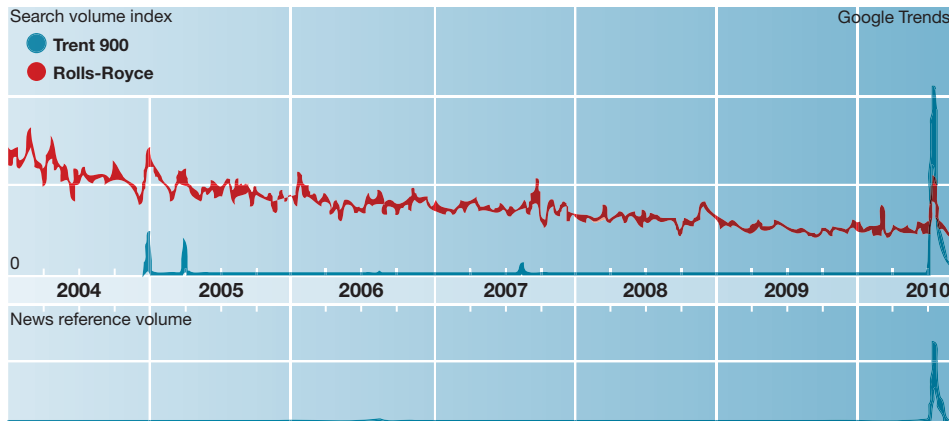
Risk management comprises two components. The first is a series of systems that set operational parameters, monitor compliance, rectify discrepancies and stimulate a range of actions that ensure conformance with standards, be they for ethics, innovation or quality. The second is protocols to deal with inevitable failures. Some refer to the latter as crisis management procedures.

#### Risk management systems and protocols

"Failure to achieve programme goals would have significant financial and reputational implications for the Company. These implications include the risk of impairment of the carrying value of the Company's intangible assets and the impact of potential litigation." So says the Rolls-Royce annual report for 2009.

Rolls-Royce has outstanding risk management systems that were established, and are overseen, by the board. The director of risk reports to the finance director. Risks are formally identified and recorded in a corporate risk register and its subsidiary

Figure 4. Google Trends plot illustrating the enormous spike in web searches for the esoteric term, “Trent 900” relative to searches for “Rolls-Royce” (top chart) and the corresponding spike in news volume. Note the absence of a spike for “Rolls-Royce” in the chart for news volume (bottom).



registers within the businesses, which are reviewed and updated on a regular basis, with risk mitigation plans identified for key risks. Those addressing operational risks are summarised below:

- Ethics – a global code of business ethics, available in 16 languages, is issued to all employees and is supported by a training and engagement programme to improve awareness of the company’s values. In 2009 a programme of technical training for specialist roles was initiated. The company’s ethical standards are also communicated to the company’s first-tier supply base through a supplier code of conduct. Concerns regarding potentially unethical behaviour can be reported in confidence via dedicated global telephone and internet channels. All such reports are followed up and are monitored by the company’s ethics committee.
- Sustainability – a robust governance structure, headed by the Environment Council, directs and monitors improvements in the environmental performance of the company’s products, and the environmental advisory board reviews and makes recommendations on the environmental aspects of the company’s products and business operations.
- Supply chain-associated – global supply chains are complex, with multiple inter-relationships across a wide network of organisations. While the company’s strategy is to improve integration and simplify the internal and external elements of its supply chain by building long-term strategic links with fewer, stronger suppliers, it remains at risk of disruption from financial or physical

causes such as bankruptcy, natural disaster, armed conflict or pandemic. The company also remains at risk for intangible asset (eg, ethical, quality, safety) risks arising from the supply chain that will inevitably concentrate downstream (ie, at Rolls-Royce).

The planning for, and management of, any such physical interruption is addressed through the company’s business continuity management process, which is well established and focused on critical facilities, activities, processes, skills and suppliers. The company’s crisis management plan and framework were significantly revised and exercised in 2009.

In addition to the company’s comprehensive programme of business interruption insurance, significant investment is being undertaken to establish, where possible, dual sourcing of key components or processes. Increased focus is also being applied to understanding and addressing sources of risk arising in the external supply chain, particularly those associated with financial instability. Procedures are in place to monitor, assess and respond to such risks.

All of Rolls-Royce’s procedures have teeth – the company has a reputation for being tough on suppliers whose performance falls below standard. The *Financial Times* quoted one commentator on the Trent 900 explosion as saying: “If this [the perpetrator of the fault] turns out to be a supplier, it will be crucified.”

#### Programme risk

The company manages complex product programmes with demanding technical requirements against stringent, and

## Action plan



- Superior reputation management is a complex and robust enterprise-wide process that offers a range of benefits.
- The implications of the loss of reputation include the risk of impairment of the carrying value of a company's intangible assets and the impact of potential litigation.
- The goal of risk management is to increase, protect and restore the assets upon which a company's continuing reputation, viability and profitability are built.

sometimes fluctuating, customer schedules. This requires coordination of the engineering function, manufacturing operations, the external supply chain and other partners. The company seeks continuous improvement of all processes and employs project management controls to ensure that both technical and business objectives are achieved. All major programmes are subject to board approval and are reviewed regularly by the board, with a particular focus on the nature and potential impact of emerging risks and the effective mitigation of previously identified threats.

### Crisis management systems

The company is remarkably tight-lipped about crisis management. And its crisis management system is just that. Aside from noting the existence of a crisis management plan for supply chain interruption, the 2009 annual report is silent. Auntie, it seems, also has a reputation for maintaining strong control over the flow of information from the company to the outside world.

The company is working flat-out to rectify the faults and to understand why the faults were not identified during inspections. But publicly, quotes the *Financial Times*, "it's as though your maiden aunt has suffered a trauma but is trying desperately to preserve an air of Victorian composure".

Rolls-Royce has not commented on the speculation over what caused the Trent 900 incident. It has refused to expand on a short statement issued on 12th November, in which the company said that it had isolated the problem to a "component" – believed to be the pipe coupling – and had a programme in hand to rectify the faults on the whole of the Trent 900 programme.

The aero-engine maker's unwillingness to divulge details about the investigation has not surprised a lot of people familiar with its general culture. First, the company is justifiably worried about others gaining access to its technical secrets. Second, given the company's deep engineering heritage, the prevailing culture is against "[making] snap judgments and early pronouncements, preferring to carefully establish the facts".

### Trent 900 explosion and aftermath

On 5th November 2010, the day after the incident, United Technologies Corp's Pratt & Whitney jet-engine unit – the third largest aerospace engine manufacturer – filed patent infringement complaints against Rolls-Royce. Pratt & Whitney claims that the Trent 900 infringes a patent for a swept-fan blade.

The suit is, at a minimum, strategic. In

the market for engines for the Boeing 787 Dreamliner, the apparent low risk of the Trent was competitively advantageous prior to 4th November. As of 6th November, a potential customer faces both safety and IP risks.

On 2nd December, Qantas began legal action. It filed a statement of claim to ensure that it can take legal action against Rolls-Royce to recover its losses caused by the explosion. Those losses relate to passenger traffic issues. After the incident, Qantas had to ground its fleet of A830s for several weeks and use Boeing 747 aircraft instead to ensure that its service was not disrupted.

The switch to the Boeing aircraft was governed by thrust limitations. It appears that the oil leak that prompted the fire and uncontained engine failure was precipitated by the increased pressures associated with higher thrusts.

The airline claimed that it would be "unprofitable" to fly A380s between Australia and the United States while thrust restrictions on the Rolls-Royce engines remained in place. The A380s would be able to carry only 80 passengers instead of the usual 450.

"Were the engines to be used with a full or commercially viable payload at the required thrust for take-off from [Los Angeles], the engines would need to be replaced after 75 such take-offs," the affidavit states.

On 10th December Rolls-Royce disclosed that it may cost US\$500 million to repair the defects in a series of small metal couplings that feed oil to bearings in the Trent 900 engine.

On 23rd December, BBC business news reporter Shanaz Musafar opened an end-of-year retrospective with the following: "Have you ever played that game where someone says a word to you and you say the first thing that you associate with it? If not, try these: Toyota, BP, Rolls-Royce or perhaps even Heathrow Airport."

On 4th January 2011 an anonymous internet user posted an innocuous question about engine safety on Answers.com.

### By the numbers

In terms of the Steel City Re Corporate Reputation Index, over the trailing 12 months Rolls-Royce had, until the crisis, been working its way up the rankings from the 75th to the 86th percentile relative to the 14 members of the aerospace and defence peer group. By the close of trading on 4th November, the ranking had slid to the 78th percentile and bottomed out at the 57th percentile a week later, before

### Taking a haircut to restore reputation

On 6th January, Bloomberg News published the following:

*British Airways signed the A380 contract, first flagged in 2007, after Chief Executive Officer Willie Walsh affirmed his 'absolute confidence' in the Trent 900... The deal took years to seal because of talks over through-life servicing, a BA spokesman said, declining to reveal if the carrier got a discount on the order's list price of \$5 billion, including seven A380s and 18 787 Dreamliners it has options to buy.*

*Rolls-Royce, the world's largest engine maker after General Electric Co., is pleased that one of its biggest airline clients continues to 'trust' in its products, CEO John Rose said.*

Steel City Re's data show that the median cost of a reputational event is 7% of market capitalisation. Given the intangible asset value to Rolls-Royce of the purchase by BA, and the implications for reputation restoration, Rolls-Royce no doubt took a material haircut on the package.

stabilising at the end of the calendar year at the 78th percentile (Figure 1). The associated jump in volatility is shown in Figure 2, and the trailing 12-week index velocity and vector similarly capture the trends over the trailing 12 weeks in Figure 3.

Economically, Rolls-Royce's return on equity was progressively outperforming that of its peers over this same period (Figure 1) until the crisis. The trailing 28-day moving average spread between Rolls-Royce and the median of its peers peaked at 16% in September and was still around 13% in early November. By the close of trading on 4th November the spread had narrowed to 11% and was down to 6% by the end of the calendar year. The spot spread on 30th December was 3%.

From the perspective of awareness, the Google Trends chart (Figure 4) shows a progressive decline over the years in web searches for Rolls-Royce and a marked spike in searches for the esoteric term "Trent 900" immediately following the crisis. Interest, however, appears to have waned rapidly in terms of both web search volume and news volume.

### Auntie knows best

Eight weeks on from the catastrophic failure of a mission-critical product, Rolls-Royce is showing the reputational and economic profile of a company with significant reputation resilience. The media appears to have backed off and the general public has lost interest.

Much of the credit for this display of enterprise value preservation goes to the company's reputation for engineering excellence and its outstanding intangible asset risk management programme.

If there is one criticism that may be levied, it is that the company's crisis communications efforts have left much to be desired. Many communications pundits have peppered the blogosphere with the

central message that chief executive Sir John Rose should have been much more visible and forthcoming.

In defence, one could argue that the Google Trends evidence speaks to the wisdom of the company's strategy – essentially, silence. And even though the 4th January posting – unanswered on the answers.com website as of 6th January – is a nagging matter, a compelling response came that same day from British Airways chief executive Willie Walsh. According to Bloomberg News, British Airways Plc, Europe's third-biggest airline, agreed to buy Trent 900s for 12 A380s, to be delivered starting 2013 (see box above).

"I'm not surprised," remarked Jonathan Salem Baskin, noted brand marketer and author of the recent *Histories of Social Media*. "Rolls-Royce focused on analysing and fixing the problem, and was likely having conversations with numerous stakeholder groups involved in that operational reality. The world wanted the business focused on business, some outlier bloggers notwithstanding, and Roll Royce's successes in its efforts were obviously recognized and valued."

There is more. Rolls-Royce, as evidenced by the lack of any signal for news volume over the years on Google Trends, appears to be a quiet company. Indeed, Auntie's composure may simply be culturally ingrained. Time will tell whether Auntie knows best. *iam*

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This series is inspired by the book, *Mission: Intangible®*, *Managing risk and reputation to create enterprise value*, published by the Intangible Asset Finance Society (IAFS). Visit the IAFS and its blog, *Mission: Intangible*, at [www.iafinance.org](http://www.iafinance.org)