Operational Risk Management: How Best-in-Class Manufacturers Improve Operating Performance with Proactive Risk Reduction

The current economic environment, the inherent complexity in managing manufacturing operations, and the global supply chain have all put more pressure on companies to focus on risk management. Organizations must be flexible, well organized, and agile enough to quickly react to adverse events, as well as shifts in market and regulatory requirements. This study will provide a roadmap for companies planning to adopt a risk-based approach to managing and reduce adverse events in manufacturing operations on a predictive basis. This Analyst Insight highlights the steps taken by Best-in-Class companies to successfully mitigate risks in order to reduce the potential impact on their financial goals.

Top Operational Risks

The volatility in demand, large investments in capital assets, and the complex nature of operations are all issues that make companies operating in fast-changing manufacturing environments unique. The pressure to get the most out of their current investments while maximizing productivity is top of mind for most executives. While these pressures are extremely important, organizations cannot forget the impact that operational risks can have on their business.

The concept of Operational Risk Management (ORM) is about creating a framework that will help executives, employees on the plant floor, and maintenance personnel understand and manage the risks impacting their organization, establish processes to effectively address these risks, and implement procedures for corrective and preventative actions.

Operational risks can be broadly categorized as people, process, and asset risks. These are highly inter-related, which makes it paramount for executives to establish a strategy that transcends functional boundaries and effectively addresses these three key areas of operational risks.

Failure to effectively respond results in production loss, deteriorating equipment condition, and the intangibles associated with brand value that could impact longer term business goals. Aberdeen benchmarked 119 executives on their ORM program and uncovered that the three areas organizations are most concerned with in 2012 include the need to reduce the impact operational risks have on the bottom-line and brand image, the unpredictable economy, and the need to grow the business (Figure 1).

“Risk management is preventive in nature, but reward structures are not aligned to reward prevention (of an uncertain event). Rather, systems are aligned to reward the resolution of a crisis, and quite frankly our human brains are wired to prefer this focus”

~John J. Brown, Director of Risk Management, Supply Chain & Technical, Coca-Cola
When asked about which risks had the biggest impact to their organization, Aberdeen found that manufacturers are juggling a multitude of risks, without any single risk as the most dominant. What this means is that it has become extremely challenging for manufacturers to identify and reduce the impact of risk to the organization (Figure 2). Additionally, as the number of organizational and geographic "silos" for risk and compliance information and analysis grows, it becomes virtually impossible to manage risks with homegrown solutions or on a disjointed basis.

Figure 1: Pressures Driving Executives to Focus on Risk

- Need to reduce the impact of operational risks on financial goals: 49%
- Unpredictable global economic environment / market instability: 34%
- Need to grow the business without increasing risk: 27%
- Need to protect the organization and its brand equity: 26%

Source: Aberdeen Group, October 2012

Figure 2: Top Risks that Have the Biggest Impact on Business

- Failure of Critical Assets: 36%
- Non-Compliance (FDA, NERC, OSHA, etc.): 33%
- Environmental Impact (spills, leaks, etc.): 30%
- Financial Risks: 28%
- Logistics Risks: 26%
- Supplier Quality: 24%
- Environmental Health and Safety (EH&S): 20%
- Supplier Risks (re-evaluate portfolio of contract suppliers): 20%

Source: Aberdeen, October 2012

“We put a large focus on managing critical equipment. You need to think productivity, but reducing environmental impact should also be a top priority.”

~ Joaquin Santos, Maintenance Manager, Discrete Manufacturer
While managing the failure of critical assets proved to be the top pressure, executives should not forget the risks associated with non-compliance, environmental, financial, logistical, and supplier issues. If nothing else, last year’s Tsunami in Japan was a sobering reminder of the effects an environmental disaster can have on the geographically extended supply chain of a manufacturing company and more importantly, the bottom line. The ripple effect from the disaster created "the perfect storm" in the global supply chain and serves as a reminder that we live in a world of risk.

**Maturity Class Framework — Stacking Up Against the Competition**

To identify how the most successful companies are overcoming these pressures, Aberdeen used four Key Performance Indicators (KPIs) to distinguish between the Best-in-Class (top 20%), Industry Average (Middle 50%), and Laggard (Bottom 30%) organizations. These business metrics were used to identify companies that were able to achieve measurable value from their risk management program across their manufacturing operations (Table 1).

**Table 1: Defining the Best-in-Class**

<table>
<thead>
<tr>
<th>Definition of Maturity Class</th>
<th>Mean Class Performance</th>
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| **Best-in-Class:** Top 20% of aggregate performance scorers | - 1.5% Unscheduled Asset Downtime  
- 92% Overall Equipment Effectiveness (OEE)  
+19% Operating Margin vs. Corporate Plan |
| **Industry Average:** Middle 50% of aggregate performance scorers | - 6.6% Unscheduled Asset Downtime  
- 83% Overall Equipment Effectiveness (OEE)  
+11% Operating Margin vs. Corporate Plan |
| **Laggard:** Bottom 30% of aggregate performance scorers | - 14.8% Unscheduled Asset Downtime  
- 74% Overall Equipment Effectiveness (OEE)  
-14% Operating Margin vs. Corporate Plan |

Source: Aberdeen Group, September 2012

Best-in-Class companies are performing at 18% higher OEE and 13% less unscheduled asset downtime as compared to Laggard organizations. Achieving such results is helping executives in Best-in-Class companies to improve profitability in the current economic environment.

Establishing a risk culture and empowering your workforce with the information to be predictive decision-makers has been instrumental to achieving Best-in-Class performance.
Operational Risk Management Framework

In order to make meaningful and better decisions to reduce the impact of an adverse event, risks need to be identified, quantified, and prioritized across all functional areas of the operation. Naturally, events will occur — but when an organization is prepared and better able to have a contingency plan to not only be prepared, but more importantly contain the event so that it doesn’t become a bigger issue. The Best-in-Class fully understand the importance of having such a structure and have implemented numerous business processes to support such an initiative (Table 2).

Table 2: Business Capabilities

<table>
<thead>
<tr>
<th>Business Capabilities</th>
<th>Best-in-Class</th>
<th>Industry Average</th>
<th>Laggard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-based approach that considers safety of employee, equipment, environment</td>
<td>80%</td>
<td>57%</td>
<td>57%</td>
</tr>
<tr>
<td>Contingency policies and escalation procedures established for responding to adverse events</td>
<td>75%</td>
<td>62%</td>
<td>56%</td>
</tr>
<tr>
<td>Historical comparison of key risk and performance indicators (e.g. variance analysis)</td>
<td>68%</td>
<td>43%</td>
<td>48%</td>
</tr>
<tr>
<td>Centralized aggregated repository for risk information (risk register) across the organization to enable sharing of institutional knowledge and lessons learned</td>
<td>53%</td>
<td>29%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Source: Aberdeen Group, September 2012

At the highest level, the Best-in-Class are more likely than their competitors to establish and enforce consistent risk management policies across geographies and the value chain. Putting a consistent, yet flexible, framework of policies in place directly facilitates the establishment of common risk-based language. What this means is these leaders have the ability to successfully identify the risks within operations, quantify the impact of these risks would have to the business, prioritize the severity of these various risks and rank which risks need to be focused on and create a closed loop process in making sure that these risks are managed.

In addition, the Best-in-Class are also more likely to have contingency policies and escalation procedures for responding to low probability, high-impact events. An internationally recognized framework, ISO 31000, provides principles and generic guidelines on risk management. The framework seeks to replace the myriad existing standards, methodologies and paradigms that differed between industries, subject matters, and regions. The featured case study explains how one company was able to implement ISO 31000 across their global operations and was able to gain better control and visibility into the risks within their operations.

“Cross functional involvement and collaboration is the key to a successful risk management and risk mitigation program.”

~Feng Li,
Procurement Director,
Schaeffler China
Process capabilities are one of the most difficult to implement as they require employees to change the way that they do their jobs. Thus, we cannot overemphasize the need to create a risk culture and open communication. It starts from having a top-down approach where organizations have an executive champion driving this change and getting buy-in from plant-level employees. The next step is to define the risk approach that best supports the continuity of the business. Asset intensive industries tend to focus on downtime but workers’ compensation, safety performance, and other Environment, Health, and Safety (EH&S) elements are also an important part of the approach.

Whether the risks are associated with their aging assets or unsafe operating procedures, the Best-in-Class also empower their employees with visibility into the data needed to make that change. In particular, Best-in-Class companies provide their employees historical data to better benchmark their performance and see where they need to improve and also access to a risk register.

This centralized, aggregated repository for risk information enables sharing of institutional knowledge and lessons learned. For example tracking safety incidents, managing audit, and change with a common tool, makes it easier to create an action item and ensures clearer communication into the root cause beyond individual experience or expertise of an operator. This is especially critical because of an impending retiring workforce — as baby boomers are planning to retire within the next 10 years — manufacturers have to be more prepared than ever to transfer this knowledge over to the newer workforce.

Additionally, as ORM programs mature, companies can begin to identify redundant and outright unnecessary processes. This enables organizations to consistently re-prioritize their resources and devote them to the risks that have the largest potential impact on both their core business processes and highest-priority corporate objectives.

**Keeping Track of Changes**

One of the biggest challenges with ORM is managing changes in the operations or plant assets, and how this change can impact the overall risk profile of a facility. Machine operators, plant managers, maintenance personnel, engineers, and third party contractors can all make changes unintentionally. For example, a plant manager might decide to run an asset three times the usual amount in order to meet a production goal (and fail to communicate this change to the safety and risk manager).

Such a change in asset utilization could mean the asset reaches critical temperatures and at a minimum causes unscheduled downtime or, even worse, an adverse event. Open communication allows regular discussion and can serve as the spark that ignites a highly communicative, full-circle, and continuous strategy department. The Best-in-Class understand the importance of having a formalized change management request strategy and have implemented such a framework (Figure 3).
The Best-in-Class have a standardized process to formally request a change in operations whether that change occurs in equipment, manufacturing process, or material changes. Following that, they have a formal process to review and approve that change in the operations. In doing so, they go through the proper channels to ensure that if the change is made, it won't impact the business. Once a change has been approved, the Best-in-Class are also more likely to make sure that it is communicated across the organization, followed by having a formalized closed loop process. In doing so, the Best-in-Class ensure that change is not only communicated but also implemented and adhered to.

**Case-in-Point**

The Coca-Cola Company is a leading beverage manufacturer, headquartered in the US, with over 146,000 employees, and operations in over 200 countries, from production to bottling. In 2008 they decided to take a hard look at their risk management program in their supply chain to determine if any improvements could be made. An internal audit was conducted of the existing risk management strategy and processes in place within the supply chain and technical areas of the company, and while risks were being identified, there were no on-going management processes to keep it alive. A good risk assessment would be done but the work would have to be repeated again in a few years.

In August 2010 it was decided to implement a framework based upon ISO31000. As John Brown, Director of Risk Management, Supply Chain & Technical explains “Our approach has been to develop a common, consistent framework with processes and tools, and make risk management
part of running the business by embedding it into existing leadership meetings. It is slow-going, but the strategy is working”. The process put in place was to help employees first identify the most significant risks at their location, then assist in analyzing those risks to get a complete set of risk characteristics and treatment (mitigation) actions which are then placed in a local risk register, and then maintain those risk registers. A list of 350 risk events was compiled of all applicable risks across Coca-Cola. This list was then sent to a number of different people from different functions at an entity to identify significant risks, the results were aggregated and the most significant risks determined. Approximately 15 to 20 of the significant risks are typically chosen for the initial deployment of the new risk management strategy. A Cause/Consequence analysis was completed on these risks to see what could be done to prevent the risk from occurring, and/or to minimize impact if it did occur, with a focus on preventative actions.

A Risk Management (RM) software platform was chosen to assist with deployment and help maintain the new risk management program. The software is centered on risk registers and risk events. The software is capable of aggregating the risks registered and helping corporate allocate resources to the most important risks. Within each local risk register there is a list of significant risks with one or more causes and consequences, and for each cause and consequence there is one or more treatment (mitigation) actions. Also each risk event has an owner assigned to it, which makes people responsible to see that the risk is managed. Each treatment action has someone assigned to it as well, which further drives ownership and accountability. This initial deployment is currently set up in approximately 30 different locations throughout the operations. Moving forward Coca-Cola will look to further implement this strategy to all operations so that the same platform is used across all parts of the business. Another work in progress is improving the user interface that workers use to operate this RM software.

Technology Enablers

To enable effective decision making, plant-level employees need to have access to timely, relevant data. The Best-in-Class are differentiating from their competitors through investments in technology, and more importantly investing in automation to enable automatic collection and aggregation of this information (Figure 4).

At the highest level, the Best-in-Class are utilizing Master Data Management (MDM). As one can imagine, the information collected during maintenance rounds, audits, continuous improvements programs, and near-miss reporting are not only massive, but are also collected through multiple applications (mobile devices, workstations, paper-based systems etc.). An MDM system enables the organization to collect, normalize, and manage all of this data, as well as maintain consistency in the way data is collected and in the way it is presented to decision makers.

“We started on a bottom up approach for developing a risk management culture. Once operational risks are controlled to acceptable tolerances (risk appetite) and an understanding of risk management was achieved, we set up an enterprise risk framework giving us the capacity that we moved on to simultaneously addressing strategic and corporate risks. Generally speaking the necessary controls are already in place, it’s just that the controls have not previously been considered as part of a risk management framework. While it is a slower process to start from the bottom up, building on small tangible success improves buy-in and future resilience. The subsequent buy-in to adopting ISO31000 and its risk management principles for managing corporate level and strategic risks has been a logic and inevitable step”

~Ken Muir, Risk Management Coordinator, Penrith City Council
Where the Best-in-Class are truly differentiating themselves is when they feed the data from their risk management system into analytics and dashboard applications. This enables these manufacturers to more easily get the "big picture" view of the state of their manufacturing operations — where the biggest risks lie — and most importantly where they should focus their efforts.

“A cross functional team (Risk management, Operations, and Supply Chain) are working together to be prepared in advance for 'HILPs' (high impact low probability events). Stakeholders were convinced that in addition to tackle 'prevention' it was also important to devote efforts to mitigate potential production 'low probability' failures. Now we are better prepared to minimize production disruption time at lower 'total failure costs.'"

~Claudio Lopez, Product / Procurement Manager, Large Utilities Company
Best-in-Class organizations rely on integrating areas that keep a company in business (Figure 5). They are more likely to understand that unplanned downtime, inability to maintain planned production rates, safety, and environmental incidences are all problems that can be traced directly to recurring equipment failure, mismatches in production capacities, and human interactions when facing these situations. For them, information such as asset reliability, spare parts availability, cost of maintenance, safety index, energy consumption, corrective actions status, and lost time accident rate are all critical information for making decisions.

Arming employees with risk information in an easy and digestible manner provides them a holistic view of the situation and reduces the risk of making bad decisions. This will enable strategic decisions to not only minimize low risk high probability events, but also prevent low probability high risk events that can create a much bigger impact on operations. Workflows also play a key piece in the effectiveness of these solutions because it ensures that alerts are sent out to the appropriate employee to mitigate and contain the situation.

As discussed earlier, people and processes strengthen a culture of risk; the third pillar is related to the adoption of technology. In particular, the Best-in-Class have the ability to automate the collection and sharing of this data to enable predictive decision making. These tools have enabled Best-in-Class companies to transform from reactive to predictive in addressing adverse events.

At the onset, incorporating these business capabilities with the right blend of analytics-backed technologies, companies have the opportunity to:

- Identify which plant assets and production processes are of high risk and place a threshold value that they need to monitor so that when the process is out of control, the application will alert the appropriate employee
- Adjust corporate activities and strategies to ensure that predetermined thresholds remain accurate
- Escalate the identification, prioritization, and remediation problem areas
- Track improvements in risk management functions by mapping current performance against the established baseline

However, when considering a solution, it is important to find a vendor that provides the scalability needed in your business. If you are an expanding business, ensure the software solution can expand across various segments as the organization grows while adapting to future goals and needs. In addition, integration is also important.

While operational risk applications enable greater consistency and visibility into the risks within your business, it becomes even more powerful when you can connect it with your enterprise systems. Integration of systems obviously makes sense; however as it is often the case, it is easier said than done.

“The main areas we are focusing on for managing risk are EH&S and Financials. We have started automating both through [our vendor], this has already resulted in increased EH&S compliance and we envision more with full automation.”

~ Director, Procurement, Large Real Estate Firm
done and sometimes requires several man hours of in-house or third-party resources. Therefore, before investing in a solution, manufacturers should evaluate all of these parameters.

**Key Takeaways**

It is extremely difficult, and in most cases with large, dispersed companies, all but impossible to comprehensively address risks on a piece-meal, siloed basis. Companies take many approaches to managing risk efficiently across their organization. Best-in-Class companies have taken a holistic approach by establishing an ORM framework and implementing it through change in business processes and organizational structure. Best-in-Class companies also leverage software tools to automate these business processes, improve visibility into the myriad of risks, and use the information to be predictive and prevent adverse events.

Aberdeen recommends the following actions for companies that look to perform at Best-in-Class level:

- **Develop a clear picture of the current risks within your organization and potential stumbling blocks in the future.** This is a critical step to avoid costly and repetitive quick-fix solution deployments. An organization must first have a deep understanding of what the risks and problems are. Although a truly ORM enterprise initiative becomes part of the organization’s structure itself, prioritizing current and future problems allows organizations to direct the proper focus toward immediate risks.

- **Establish an ORM strategy to manage the risks across the enterprise.** This will help organizations have a structured process to identify, quantify, and prioritize risks and have procedures in place to mitigate the risks in an impactful way. This strategy also enables routine and open communication across the organization to identify and expose an unacceptable level of risk.

- **Enable a risk-based culture.** This begins by having a top-down approach where an executive will lead the change in the culture followed by establishing collaboration across functional teams. It will enable organizations to understand the risks of overall operations and establish interoperable processes that enable mitigation and control of risks to prevent events.

- **Create a formalized management of change strategy.** Best-in-Class companies understand the important of having a formalized process to request, approve, and communicate changes across the value chain. Incidents, injuries, and unscheduled downtime often occur when someone within the value chain makes a change without understanding the business impact.

- **Incorporate a central, secure, and accessible repository for risk-related information (risk register).** Establishing a risk-information repository can be used as one of the foundational

“Our approach has been to develop a common, consistent framework with processes and tools, and make risk management part of running the business by embedding it into existing leadership meetings. It is slow-going, but the strategy is working.”

~ John J. Brown, Director of Risk Management, Supply Chain & Technical, Coca-Cola
building blocks to help drive a risk-centric mentality into employees at all levels.

- **Incorporate analytics and dashboard tools to monitor key performance and risk indicators.** With the consistently multiplying amount of data collected in operations, intelligent tools can prove invaluable to risk management efforts. These technologies help sift through the volumes of data and highlight the important and relevant from the useless and unnecessary. Analytics and dashboards relay the pertinent knowledge to individuals who can capitalize on its availability.

- **Adopt risk-, audit-, and change-management tools.** These applications will help with the automation of all the risk, audit, and change processes across operations. In addition, it enables easier management of all the data (whether it is operational, IT, brand, or reputation related) and enables collaboration across these functional groups.

For more information on this or other research topics, please visit [www.aberdeen.com](http://www.aberdeen.com)

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
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<td>Operational Risk Management; October 2011</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

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