

RISK

BY JONATHAN BELLMAN, CPIM

Control

A look at supply chain continuity planning.

Prudence requires businesses to consider the potential impact of debilitating, unanticipated events. Tragically, it may have taken the catastrophes of September 11th to heighten our awareness of the implications of assuming we will always be operating under business-as-usual conditions. It's important to consider how critical a company's supply chain is to its bottom-line profitability. Even short-term compromises in the integrity of that supply chain can translate into massive losses of revenues, strained customer relationships, and reduced goodwill. Can your company withstand a cessation of business and possible loss of its favored vendor status with primary customers?

In these times, companies compete on the strength of their continuity plans, i.e., how well they are able to recover from unplanned events. Proper event management is an excellent way to gain a competitive advantage with major customers. If you can ship product when your competitors can't, you will have the edge. It is essential for a company to evaluate, identify, and reduce its event-driven, supply chain risks. By arming a company's supply

chain in advance, business is more likely to avoid perilous cost or even shutdown if an event occurs.

In the normal course of business, manufacturing companies experience supply chain ripples caused by changes in demand patterns, production difficulties, and seasonality. Most companies react effectively to these ripples with little loss of effectiveness or profitability. Well-managed companies tend to learn from their mistakes while continually tuning their processes, and this enables them to be effective in dealing with normal variability.

Events drive massive increases in variability and can occur inside your company's facilities, at a trading partner, or within your transportation network. Events can cause violent changes within a supply chain. Major events such as fires, hurricanes, utility failures, floods, hazardous material accidents, acts of terrorism, explosions, or major transportation accidents can be catastrophically disabling. Minor events such as loss of a production tool or a critical machine operator can be surprisingly expensive. A lost shipment by a carrier or even a supplier bankruptcy may imperil critical customer relation-

ships. During an event, normally stable processes may undergo radical changes. Successive events and multiple concurrent events can have a cumulative

At-a-Glance

- Supply chain continuity planning can protect the integrity of a company's supply chain. Even short-term compromises can translate into massive losses of revenues, strained customer relationships, and reduced goodwill.
- Defining project boundaries is a critical task because the greatest supply chain risks are often beyond the walls of the manufacturing facilities.
- Expected cost (EC) analysis is an excellent method to assess and control risk.
- Risk control is a balancing act, designed to optimize the tradeoffs between post-event recovery costs and pre-event planning costs.

impact upon production, productivity, and revenue.

A single weak link threatens the entire supply chain. Who will your customers blame if you can't ship? A supply chain continuity plan looks at the entire supply chain, how your partners are managing their supply chains, and who is most susceptible to failure. Certain events affect specific companies while other events can affect entire industries. Properly executed plans could enable a company to seize market share from competitors if an industry-wide event occurs.

Unfortunately, too many companies scramble to develop alternate supply lines *following* an event. This reactive strategy is risky and weak. Supply chain continuity planning proactively protects the integrity of the supply chain and should consider its true reach, spanning the suppliers' suppliers to the customers' customers. Sound supply chain continuity planning, and the company's subsequent corrective measures, will decrease the risk of disrupting production and shipments should an event occur.

Supply chain continuity planning can be conducted in four phases: Preparing, identifying and evaluating, controlling risk, and testing.

Phase I: Prepare

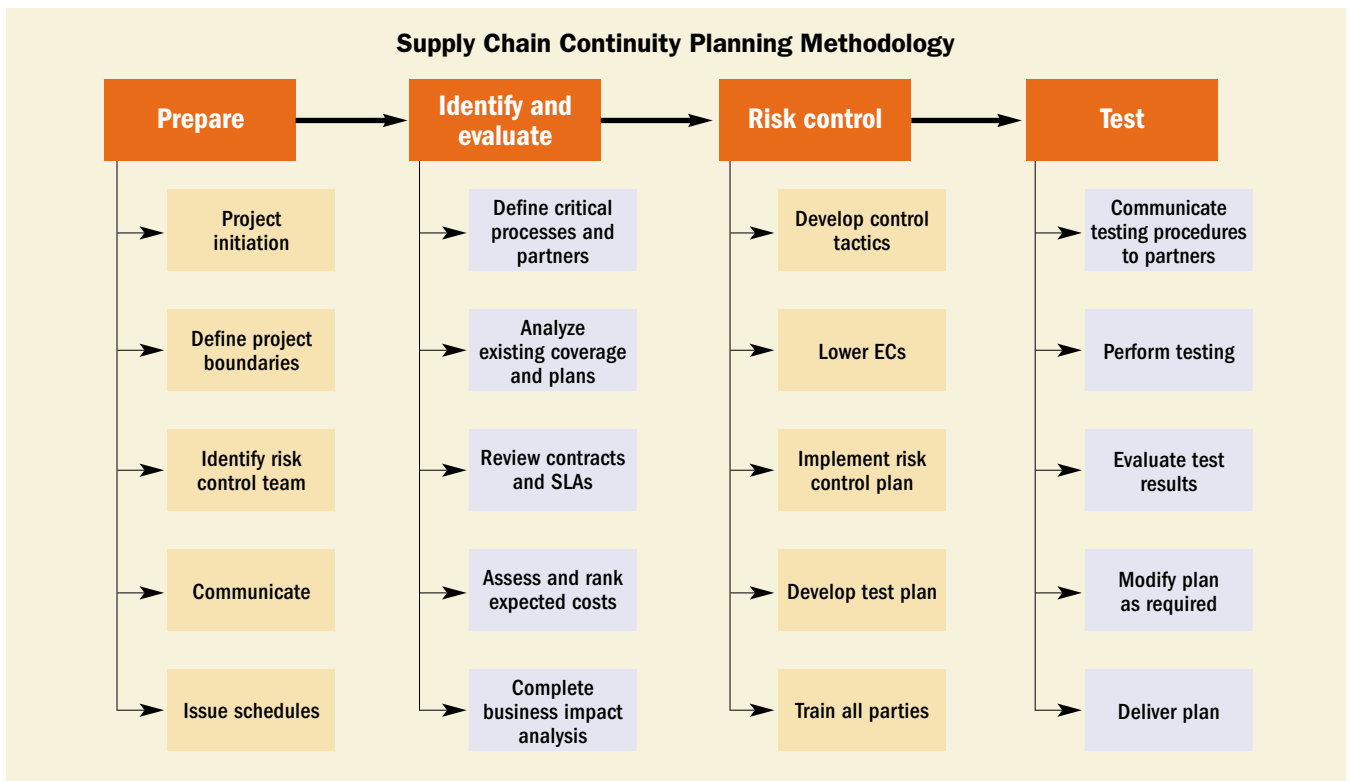
IN THE PREPARATION phase, you define project boundaries, identify risk control team members, and communicate the approach and methodology (see chart). Defining project boundaries is a critical task because the greatest supply chain risks are generally beyond the walls of the manufacturing facility. Supply chain continuity planning must be collaborative in order to be effective, and it may need to encompass many parties, including customers, suppliers, public infrastructure service providers, and shippers. The planning process is best led by a manager with deep experience and organizational knowledge who will control the scope of the plan and focus it on the areas of the business most affected by events.

A medium- or large-size business may contain a supply chain with hundreds of potential failure points. The

leader would be responsible for targeting the team's energies toward attacking the most insidious risk areas. Once the riskiest areas are addressed, the leader would move on to less risky ones. Since an organization's supply chain is dynamic, business areas should be reviewed at least quarterly to ensure risk profiles haven't changed significantly.

Supply chain continuity planning is best performed by an interdisciplinary team of managers, which may include representatives from sales, operations, accounting, production control, and purchasing. In the preparation phase, the leader schools the team on expected cost (EC) analysis, which provides an effective metric for assessing and understanding risk. The EC of an event is determined by multiplying the probability of the occurrence of an event by the expected economic impact of that event. The probabilities and expected economic impacts are determined by the risk control team.

Consider Acme Plumbing Products Company, a manufacturer of commercial plumbing fixtures. At Acme, the



risk control team is led by an assistant plant manager. The team might include the following: a buyer who understands the most critical purchased parts, a manufacturing manager who schedules production, a quality manager who ensures subassemblies are up to standard, a traffic manager who understands outbound supply chain risks, as well as a representative supplier and a customer. The team leader gathers the group in a brainstorming session where the team talks through the primary business processes and uncovers key risk areas. A knowledgeable team leader can be enormously valuable in keeping the team on track in these discussions.

Phase II: Identify and evaluate

THIS PHASE is a discovery process in which the risk control team defines critical business processes and partners, evaluates existing disaster recovery plans, identifies risk areas and vulnerabilities, and quantifies the expected costs resulting from threat occurrences. These ECs will comprise what is often referred to as the business impact analysis.

The process for identifying risk starts with data and ends with creative thinking. Examining your company's accounts payable summary reports enables you to determine your company's main sources of spending. Evaluate disaster recovery plans from both a systems and facilities standpoint for supply chain impact and analyze business insurance policies to determine coverage. Review raw material supply agreements to determine liability risk as well as customer and service level agreements (SLAs). Typically, many risks are not identified through document reviews but are uncovered through multidisciplinary analyses and discussions.

For example, let's say Acme's team has identified three potential events within the scope of its study: a supplier strike, a fire, and the loss of a critical tool. The risk control team determines the likelihood of each of these events occurring in the next twelve months is 5 percent for the supplier strike, .1 percent for the fire,

and 20 percent for loss of a critical tool.

Based on its experience, the team determines a strike would probably last no more than three weeks. This would cause Acme to lose three weeks worth of revenues, at one million dollars per week. The EC of the strike would be $.05 \times 3 \times \$1,000,000$, or \$150,000. Using the same approach, the team then determines a fire shutting down the plant would cause twenty weeks of lost production. The fire's EC would be $.001 \times 20 \times \$1,000,000$, or \$20,000. The team determines the loss of a critical tool would result in one week of lost production, yielding an EC of $.20 \times 1 \times \$1,000,000$, or \$200,000.

While Acme's existing disaster recovery plans took into account potential fires and strikes, they never addressed the loss of a critical tool. Acme should rank its ECs and devote its risk control resources toward attacking the highest ranking ones. A lost tool could easily cost the company more than either a fire or a strike.

Consider airline safety in a similar manner. An airline understands the cost of an airplane crash is catastrophic. Should an airline invest all its resources in reducing the likelihood of a crash? By using expected cost analysis, the airline might determine its funds are better spent by installing extra security cameras in its baggage claim area to reduce the loss due to baggage theft. The airline determines that the probability of the theft of a bag is hundreds of thousands of times higher than the likelihood of a crash, so it focuses its resources on a problem on which it can have a more direct impact.

Phase III: Control risk

THE RISK CONTROL phase is designed to address risks through elimination, negation, and mitigation. Some risk areas may be completely eliminated. In other words, their ECs can be reduced to zero. Elimination is rarely an option, however, because it is often difficult to eliminate components of business processes without interfering with the integrity of those processes. Suppose

Acme's plating department has an exposed high voltage wire above the switch for its sulfuric acid bath. The operator on that line has been there for twenty years and has never touched the wire. If the operator slips and touches the wire, he or she could become electrocuted and fall into the acid bath, a double whammy. Both risks could easily be eliminated by insulating the wire.

Negation drives down the EC of a risk to near zero. Suppose the same operator typically works above the acid bath. There is no longer an exposed wire to deal with, but there is always the remote possibility he or she will trip and stumble into the bath. This risk can be negated by moving the operator platform well below the bath. This would be an expensive and probably undesirable investment because the existing setup is relatively safe.

Mitigation is the most commonly used risk control strategy. In the earlier example of a supplier strike, Acme may want to certify an additional supplier or build inventory in front of its production line. In the case of the critical tool, Acme may want to commission another tool. In both these approaches, Acme must balance the investment in mitigation with the reduction in EC. Acme may avoid purchasing spare tools for some of its lower revenue products because the EC reduction wouldn't justify the incremental cash outlay. The risk control team may determine the best way to mitigate the EC of a fire is by improving its alert procedures. This could reduce EC with little incremental cost to the company.

Certain risks can be mitigated before the event; in other cases, risk control resources will need to be scrambled afterwards. The risk control team must create a mitigation implementation plan, which can rapidly be put in place after the event. This may include changing processes, engaging standby or "hot-site" facilities, or activating alternate suppliers. The better the pre-event planning, the greater the effectiveness of the post-event activities. Inventory investment, typically seen as anathema to

companies looking to streamline costs, is an excellent example of a pre-event mitigation strategy. Risk control is a balancing act, designed to optimize the tradeoffs between post-event recovery costs and pre-event planning costs.

Following the creation of the implementation plan, the team must develop testing procedures that can be executed by the risk control team. The line personnel would be given an opportunity to review and, if appropriate, modify

the plans. The risk control team should provide training to company operations and production personnel as well as key suppliers and customers.

Phase IV: Test

THE TEST PHASE enables business continuity plans to be properly shaken down in a planned event scenario. A fire drill is an excellent test designed to refine recovery processes and ensure they are reliable. Wherever practical, the

team leader would conduct structured walk-through testing of the recovery plans. If a recovery strategy calls for the activation of the alternate supplier, the test would include the production of a limited amount of parts on that supplier's line to ensure quality. Vendor notification mechanisms and contingency plans should be tested to ensure they are functioning properly. Following testing, reconvene the risk control team to review preliminary findings, incorporate sponsor feedback, and modify the plan as required.

A supply chain continuity plan is a living document and should be regularly updated when new risks are identified. Testing is an ongoing process. The risk control team should take an active role in monitoring the performance of each process, understanding the implications should any of them fail. It is recommended the team meet quarterly to identify new sources of risk generated by ongoing operations and normal business evolution.

The key benefit of supply chain business continuity planning is an increased ability to maintain a competitive advantage following an event. Additional benefits may include lowered insurance costs if your facility is re-rated based on its improved risk control procedures, deeper relationships with supply chain partners, and goodwill with customers, suppliers, and employees.

In the past, many companies ignored supply chain continuity planning, presumably because the risk of an event was perceived to be extremely low. Recent events indicate otherwise. Top management must accurately assess the company's readiness to respond to an event because the failure of any link in the supply chain could disrupt cash flow and threaten business. The cost of preparedness pales in comparison with its benefits. ◆

Jonathan Bellman, CPIM, is founder of Reality Check, Inc., a consulting firm specializing in supply chain, enterprise resources planning, and e-business projects. He can be reached at (212) 946-5476 or via e-mail at jbellman@rcheck.com.