

Supply Chain Resilience Management: making supply chains resilient

Supply Chain Resilience Management refers to the systematic planning, control and monitoring of procurement and supply chains with the aim of anticipating disruptions, limiting their impact and quickly restoring the ability to supply. For industrial buyers, the approach combines classic supplier management with risk management, scenario planning and operational emergency processes. This lexicon compactly explains the definition, methods, key figures and control mechanisms.

Key facts

- Supply Chain Resilience Management encompasses preparation, detection, response and recovery in supply chain disruptions.
- Typical levers are dual sourcing, safety stock, an expanded supplier base and transparent multi-tier visibility.
- Resilience costs money; the trade-off with capital tie-up and purchase prices is managed through risk assessments.
- Key figures are supplier failure risk, time-to-recover, OTIF and shortage rates.
- The approach is ongoing: assessment, measures, monitoring and exercises are repeated regularly.
- For suppliers, resilience is increasingly an award criterion in tender management and supplier selection.

Definition: Supply Chain Resilience Management

Supply Chain Resilience Management is the orchestrated process by which companies make the resilience of their entire supply chain measurable and deliberately strengthen it. It differs from pure supplier risk management in that logistics nodes, suppliers' second-tier suppliers, transport routes and critical spare parts are also included. The aim is not to avoid every disruption, but to limit the impact on production, revenue and customer commitments.

Distinction from classic supplier management

Classic supplier management optimises the performance, prices and quality of the existing supplier base, for example via key figures such as the supplier PPM target or on-time delivery. Resilience management supplements this perspective with the question of what happens if a supplier or a region fails. The two disciplines interlock: a poor-performing supplier is usually also a resilience-relevant risk, and conversely the normal supplier evaluation system provides the data basis for risk assessment.

Types of risk in the supply chain

In practice, four risk classes can be distinguished: operational failure of individual suppliers, site and logistics risks, market risks such as price or raw material volatility, and systemic events such as pandemics, geopolitics or natural disasters. The classes require different measures, from alternative procurement routes to price index linkage in volatile raw material markets.

Methods and approach in resilience management

Effective resilience management follows a closed control loop: assess, decide, implement, monitor. The starting point is a structured risk analysis across the material group hierarchy, so that effort and levers are focused on the critical parts and material groups.

Risk assessment and criticality analysis

First, the criticality of supply is assessed per item or material group: revenue relevance, number of available suppliers, changeover times, lead times and regionality. A Pareto concentration often emerges, in which a small proportion of parts carries the bulk of the risk. On this basis, a risk matrix is created that prioritises measures such as second source, safety stock or design change.

Multi-tier supply chain transparency

Resilience does not end with the direct supplier: failures frequently occur at the supplier's supplier, for example with special components, preliminary products or limited manufacturing capacity. In practice, enquiries about critical upstream tiers are made as part of supplier selection or via self-disclosures that go beyond the order confirmation obligation. Full multi-tier visibility is rarely achievable; transparency for the most critical 10 to 20 per cent of procurement volume is realistic.

Sourcing strategies as the core lever

The most important instrumental levers are dual or multi-sourcing, deliberate regional diversification, framework agreements with capacity commitments and building an expanded supplier base with qualified alternatives. Vertical integration or external manufacturing with alternative contract manufacturing partners can also serve as a fallback. With pilot-run procurement and new parts, resilience is anchored early, since creating sources retroactively is significantly more expensive.

Key KPIs for managing resilience

Resilience can only be managed if it is measurable. Key figures that depict both the quality of precautionary measures and operational responsiveness have proven their worth. They are typically discussed quarterly in the supplier review and annually in the Joint Business Plan (JBP) with strategic partners.

Supply and supplier key figures

Core indicators are OTIF (On Time In Full), the shortage rate or supplier PPM target, the number of qualified second sources per critical material group and the proportion of critical articles without a fallback level. Carrier performance and delivery times per route supplement the logistics perspective. An increase in exceptions in exception management is often an early indicator of deteriorating ability to supply.

Response and recovery times

Two key figures characterise resilience directly: time-to-detect (how quickly a disruption is detected) and time-to-recover (how long the restoration of supply takes). In practice, targets of days to a few weeks are often aimed at as guideline values for critical parts; the appropriate magnitude depends on the industry and part type. In addition, many companies measure the days of cover for critical articles as a buffer indicator.

Economic balance of precaution

Resilience measures incur costs through multi-source pricing, safety stock and auditing. It makes sense to compare precautionary costs against avoidable failure costs, such as production downtime, customer order cancellations or expensive emergency procurement. This allows the trade-off with capital tie-up and accounts payable lead time optimisation to be negotiated objectively rather than emotionally.

Risks and controls in operational handling

Even good precautionary measures do not rule out disruptions. Decisive are coordinated control processes, clear responsibilities and contractual tools that secure room for manoeuvre in the event of disruption.

Contractual tools

Framework agreements should contain capacity commitments, notification obligations in the event of supply problems and escalation routes. Incoterms DPU or other delivery clauses determine from which point transport and customs risks lie with the buyer – an often underestimated lever. Bank guarantees/sureties or set-off agreements are common for payment securities towards critical but financially weak suppliers. With price volatility, price index linkage stabilises the partnership rather than burdening it with one-sided price enforcement.

Operational emergency processes

In the event of disruption, established processes are decisive: structured shortage management with prioritisation by production sequence, accelerated escalation including 5 Why for root cause analysis, and clear rules on order cancellation including damage documentation. Functioning exception management with defined responsibilities and response times prevents warning signals from being lost in day-to-day business. Regular exercises – such as a simulated supplier failure – reveal gaps in the emergency plan before things get serious.

Controlling the suppliers themselves

The financial health and performance capability of suppliers are checked periodically, especially with sole sources. The tools for this are supplier audits, credit indications, analysis of the tender management history to gauge market dynamics, and structuring instruments such as a Delivery Schedule Agreement with binding call-off and notification obligations. Where specifications are deviated from, a disciplined deviation approval process decides, so that quality risks do not silently accumulate.

Current developments and requirements

Regulatory requirements, digitalisation and changed value creation structures are changing the role. Resilience management is evolving from reactive crisis management to a permanent component of procurement strategy.

Regulation and sustainability

Supply chain due diligence laws and sustainability reporting expand the risk assessment to include human rights and ecological issues along the chain. Topics such as the recyclability of packaging thus find their way into supplier evaluation. Buyers should check which obligations apply in each individual case; the details are case-dependent and change continuously.

Digitalisation and data basis

Procurement platforms, supplier portals and standardised data flows reduce the cost of transparency: order confirmations, call-off messages and status data flow in a structured manner rather than by email. Dashboards for OTIF, open purchase orders and exceptions make risks visible earlier. Data quality is crucial: without well-maintained supplier and material master data, every analysis remains mechanically distorted.

Changed value creation architectures

After disruptions, many companies examine reshoring or the regionalisation of manufacturing, for example via contract manufacturing in several regions. This increases resilience, but also changes tender management, cost structure and supplier relationship management. Which architecture is right depends on volumes, degree of specialisation and capital tie-up – blanket 'backshoring' recommendations fall short.

Typical metrics

OTIF (On Time In Full): > 95 %

Practical guideline; critical material groups typically require higher targets.

Supplier PPM target: < 500 PPM

Depends on industry and part; quality is a resilience indicator.

Qualified second sources per critical item: ≥ 1

The proportion of critical parts without a fallback level should be close to zero.

Time-to-Recover: Days to a few weeks

Guideline for critical parts; strongly dependent on industry and lead times.

Days of cover for critical parts: 20–60 days

Common guideline values for safety stock; factor in capital tie-up.

Practical example

A medium-sized mechanical engineering company with around 400 actively ordered material numbers discovered, after an electronics failure at a sole supplier, that more than 60 critical articles had no second source. Building on this, the company established a risk control loop across all material groups and anchored resilience criteria in supplier selection.

- Criticality analysis across the material group hierarchy with prioritisation by revenue and downtime risk
- Development of an expanded supplier base: second sources for the most critical items, validated through pilot-run procurement
- Delivery Schedule Agreement with notification obligations and capacity commitment for the strategic core suppliers
- Quarterly Exception Management Review with OTIF, shortage and time-to-recover figures plus 5-Why analyses

Conclusion

Supply Chain Resilience Management is not a project, but a permanent control loop of assessment,

measures and monitoring. The core lies in focusing on the truly critical material groups and suppliers rather than comprehensive protection across the board. Measurable figures such as OTIF, shortage rate and time-to-recover make the state manageable and justify precautionary costs internally. Those who anchor resilience criteria early in tender management and supplier selection avoid expensive retrofitting. Buyers who act in this way transform supply chain disruptions from existential risks into manageable operational risks.

Frequently asked questions

What does Supply Chain Resilience Management mean?

It describes the systematic management of the resilience of supply chains against disruptions such as supplier failures, logistics problems or market crises. The approach encompasses precautionary measures (e.g. second sources, safety stock), early detection via key figures and defined emergency processes. The aim is for a disruption to affect production and customer supply as little as possible.

How do you build supply chain risk management?

In practice, you start with a criticality analysis per material group: Which parts are relevant to revenue and downtime, and how many suppliers are there? This is followed by measures such as dual sourcing, safety stock or regional diversification for the most critical items. In addition, notification obligations are included in contracts and KPIs such as OTIF and shortage rates are established.

Which KPIs measure resilience in the supply chain?

Key figures are OTIF, shortage rate or supplier PPM target, the number of qualified second sources per critical material group, as well as time-to-detect and time-to-recover. The proportion of critical items without a fallback level and the days of cover for critical parts are also practically relevant indicators.

What is the difference between resilience and supplier risk management?

Supplier risk management primarily looks at individual suppliers and their performance capability. Resilience management broadens the perspective to the entire chain, including upstream tiers, transport routes and logistics nodes. Both disciplines use the same data basis, but resilience additionally assesses system failures and multi-tier scenarios.

What does supply chain resilience cost?

The main costs are higher purchase prices from second sources, capital tied up in safety stock, and the effort required for auditing and transparency. As a rule of thumb, many companies consider precautionary costs in the low single-digit percentage range of the affected procurement volume to be appropriate. These are set against avoidable failure costs such as downtime, emergency procurement and customer order cancellations.