

SPECIFIC-CASE

WORKSHEET 8 OF 9

# Vendor Lead-Time Extension — Safety Stock Recalculation

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*Scenario: your primary vendor for a Category A SKU has just announced an 18-month period of extended lead times, moving from your current 5-day lead time to a 21-day lead time. The existing ROP was calculated on the 5-day figure. You need to recalculate both the ROP and the safety stock before the next order cycle, and assess whether holding the new safety stock is affordable at your current carrying cost rate.*



*Inventory Optimization Techniques*  
by Ibrahim Anwar

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## What This Is For

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A lead-time extension from 5 days to 21 days does not feel catastrophic when the vendor announces it. By the time the next order cycle comes around, the feeling shifts. The ROP that was calibrated for 5-day delivery will not protect against a 21-day wait, and a stockout in a Category A SKU during the vendor's extended delivery window is exactly the kind of system failure the book describes as preventable. This worksheet prevents it by forcing the recalculation before the first order under the new lead time is placed.

The secondary question the worksheet raises is whether the new safety stock level is affordable at the current carrying cost rate. Holding 16 additional days of safety stock has a monthly cost, and that cost should be compared against the monthly cost of sourcing a backup vendor at a higher per-unit price. Sometimes the backup vendor is cheaper when the carrying cost of the extra safety stock is included. The worksheet makes that comparison possible.

## Benefits

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What you get when you actually run this worksheet on a real situation:

- Recalculates the ROP and safety stock before the next order cycle runs under the new lead time, preventing the first stockout from being the thing that reveals the old parameters were wrong.
- Quantifies the monthly carrying cost of the new safety stock level in dollars, giving the operator a concrete number to compare against alternative sourcing options.
- Identifies whether the new safety stock carrying cost is absorbable within current cash flow or whether it requires a purchasing plan adjustment.
- Documents the recalculation with dated inputs so the decision trail is clear if a stockout occurs anyway — showing the parameters were updated based on known information.
- Surfaces the backup vendor question at the right moment — before the extended lead time produces a crisis — when there is still time to qualify and test an alternative.

## Framework To Use

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### — Lead-Time Sensitivity Test

*Safety stock and ROP scale directly with lead time. A four-fold increase in lead time produces a proportional increase in both — and a proportional increase in carrying cost.*

Parameter	Old (5-day lead time)	New (21-day lead time)
Basic ROP = avg daily × lead time	avg daily × 5	avg daily × 21
Safety stock = (max – avg) × lead time	(max – avg) × 5	(max – avg) × 21
Final ROP = Basic + Safety	Lower total	Higher total
Safety stock value (\$)	Lower holding cost	Higher holding cost
Monthly carrying cost of safety stock	Affordable baseline	Recalculate before next order

# How To Use

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Follow these steps in order. Each one builds on the previous.

- 1 Step 1: Write the SKU name and category at the top of the worksheet. Confirm it is Category A – if it is not, the extended lead time may be manageable with a simpler approach.
- 2 Step 2: Pull the past 30 days of daily sales for this SKU. Calculate average daily sales (total ÷ 30) and maximum daily sales (highest single day).
- 3 Step 3: Fill in both lead time values: the old 5-day lead time and the new 21-day lead time.
- 4 Step 4: Calculate Basic ROP for both: average daily sales multiplied by lead time. Fill in both columns.
- 5 Step 5: Calculate safety stock for both: (maximum daily sales minus average daily sales) multiplied by lead time. The difference between old and new safety stock is the additional buffer the business must now hold permanently.
- 6 Step 6: Calculate the final ROP for both: Basic ROP plus safety stock.
- 7 Step 7: Calculate the safety stock value in dollars: safety stock units multiplied by purchase price per unit.
- 8 Step 8: Calculate the annual and monthly carrying cost of the new safety stock: safety stock value multiplied by carrying cost rate for annual, divided by 12 for monthly.
- 9 Step 9: Fill in the comparison question: can this monthly carrying cost be absorbed without reducing other ordering activity? If yes, update the stock card and place the next order at the new ROP. If no, proceed to the backup vendor evaluation.
- 10 Step 10: Update the stock card for this SKU immediately with the new ROP. Do not wait for the next monthly review.

## Example Use

*A supermarket supplies distributor sources disposable food containers (500ml, 50-pack carton) from a supplier who has announced logistics disruptions extending delivery from 5 days to 21 days for the next 18 months.*

The distributor opens the worksheet and pulls 30 days of sales data for the container SKU. Average daily sales: 8 cartons per day. Maximum daily sales in the past 30 days: 13 cartons (on the day before a local food fair). Purchase price: \$4.20 per carton. Carrying cost rate: 25%.

Old parameters (5-day lead time):

Basic ROP =  $8 \times 5 = 40$  cartons.

Safety stock =  $(13 - 8) \times 5 = 25$  cartons.

Final ROP =  $40 + 25 = 65$  cartons.

New parameters (21-day lead time):

Basic ROP =  $8 \times 21 = 168$  cartons.

Safety stock =  $(13 - 8) \times 21 = 105$  cartons.

Final ROP =  $168 + 105 = 273$  cartons.

The safety stock has grown from 25 to 105 cartons — 80 additional cartons that must now be held continuously as buffer.

Safety stock value at new level:  $105 \times \$4.20 = \$441$ .

Annual carrying cost of new safety stock:  $\$441 \times 25\% = \$110.25$ .

Monthly carrying cost:  $\$110.25 \div 12 = \$9.19$ .

The operator writes at the bottom of the comparison row: "Monthly cost of new safety stock = \$9.19. This is absorbable." The new ROP of 273 cartons is written on the stock card immediately. An order is placed today — the current balance of 80 cartons is already below the new ROP of 273.

The backup vendor question: the operator contacts a regional supplier who can deliver in 7 days at \$4.60 per carton — \$0.40 more per unit. At 8 cartons per day, annual volume is 2,920 cartons. The price premium for all volume through the backup vendor would be  $\$0.40 \times 2,920 = \$1,168$  per year — significantly more than the \$110.25 safety stock carrying cost for the primary vendor. Decision: stay with primary vendor, hold the new safety stock level, keep the backup vendor on file as emergency-only.



## Reflection Prompts

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*After filling in the worksheet on the previous page, work through these.*

1. Rows to fill: average daily sales (units); maximum daily sales (units); lead time (days); basic ROP = avg daily  $\times$  lead time; safety stock = (max - avg)  $\times$  lead time; final ROP = basic ROP + safety stock; safety stock value in dollars (safety stock units  $\times$  purchase price); annual carrying cost of new safety stock ( $\$ =$  safety stock value  $\times$  carrying cost rate); monthly carrying cost of new safety stock ( $\$ \div 12$ ); comparison — can this monthly cost be absorbed by the business without reducing other ordering activity?
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2. If the new safety stock carrying cost exceeds what the business can absorb: identify which secondary vendor can supply this SKU at a shorter lead time. A backup vendor that costs 5% more per unit but delivers in 7 days may cost less annually than holding 16 additional days of safety stock at your carrying cost rate. Calculate both before deciding.
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# Tips and Traps

## TIPS

- Update the stock card the day this worksheet is completed — not next week. The old ROP is wrong from the moment the vendor's notice was received.
- If the new final ROP exceeds the current balance on hand, an emergency order is required before any other action. Fill row 9 (current balance vs new ROP) first to determine whether today is already past the trigger point.
- When calculating the backup vendor comparison, use the cost difference for all volume that would pass through the backup vendor — not just the marginal volume during the extended lead time period.
- For other Category A SKUs sourced from the same vendor, run this recalculation for each one. A lead-time change from one supplier often affects multiple SKUs simultaneously.
- Retain the completed worksheet as documentation that ROP parameters were updated in response to the vendor's notice. If a stockout occurs during the 18-month extension period, the worksheet demonstrates the system was adjusted with available information.

## TRAPS

- Treating the recalculated ROP as a new permanent setting. When the vendor's extended lead time period ends and normal delivery resumes, the ROP must be recalculated again using the original lead time.
- Comparing only the per-unit price of the backup vendor without factoring in the lead time difference and its effect on safety stock requirements. A cheaper vendor with a longer lead time may require more safety stock, offsetting the price saving.
- Placing an order at the new ROP quantity but forgetting to adjust the EOQ for the longer ordering cycle. With longer lead times and more safety stock, the optimal order quantity may also shift.
- Assuming the new safety stock is affordable without checking current cash flow. \$9.19 per month in carrying cost is small. But if five Category A SKUs from the same vendor all require increased safety stock, the aggregate monthly cost is worth confirming against available working capital.
- Waiting for the first stockout to confirm that the old ROP was wrong. The vendor's announcement is the signal. The recalculation must happen before the next order cycle, not in response to a customer complaint.

# Appendixes

## Appendix A – Lead-Time Recalculation Reference Card

Basic ROP = average daily sales × lead time (days)  
 Safety stock = (maximum daily sales - average daily sales) × lead time  
 Final ROP = Basic ROP + safety stock  
 Safety stock value = safety stock units × purchase price per unit  
 Annual carrying cost of safety stock = safety stock value × carrying cost rate  
 Monthly carrying cost = annual ÷ 12

For a lead-time change from L1 to L2:

New basic ROP = avg daily × L2  
 New safety stock = (max - avg) × L2  
 Difference in safety stock (additional units to hold) = (max - avg) × (L2 - L1)  
 Additional monthly carrying cost = additional units × price × rate ÷ 12

## Appendix B – Primary vs. Backup Vendor Comparison

SKU: \_\_\_\_\_

Primary vendor (extended lead time):

Lead time (new): \_\_\_ days  
 Price per unit: \$\_\_\_  
 Safety stock required (new): \_\_\_ units  
 Monthly carrying cost of safety stock: \$\_\_\_  
 Annual carrying cost of safety stock: \$\_\_\_

Backup vendor (shorter lead time):

Lead time: \_\_\_ days  
 Price per unit: \$\_\_\_  
 Safety stock required: \_\_\_ units  
 Monthly carrying cost of safety stock: \$\_\_\_  
 Price premium per unit vs primary: \$\_\_\_  
 Annual price premium on total volume (D × premium): \$\_\_\_  
 Annual carrying cost saving vs primary safety stock: \$\_\_\_  
 Net annual benefit of switching to backup for this SKU: \$\_\_\_

Decision: Use primary + hold new safety stock / Switch to backup  
 (circle based on net annual benefit calculation)

## Appendix C – ROP Rollback Reminder

This worksheet was prepared in response to a temporary lead-time extension. When the extension period ends, ROP must be recalculated using restored lead times.

Vendor lead-time extension notice date: \_\_\_\_\_

Stated extension duration: \_\_\_ months

Expected restoration date: \_\_\_\_\_

ROP rollback reminder set in calendar: Y / N

Rollback recalculation inputs (to fill when extension ends):

Lead time restored to: \_\_\_ days

Average daily sales at that time: \_\_\_ units

Maximum daily sales: \_\_\_ units

Recalculated Basic ROP: \_\_\_

Recalculated Safety stock: \_\_\_

Recalculated Final ROP: \_\_\_

Update stock card on: \_\_\_\_\_



WHERE THIS WORKSHEET COMES FROM

# Inventory Optimization Techniques

*Stock That Sleeps Is Capital That Is Locked*

by Ibrahim Anwar

This worksheet is one of nine in the *Inventory Optimization Techniques* companion worksheet pack. The full pack is grouped into three categories: high-volume worksheets you can run weekly, niche-search worksheets for rare but high-value situations, and specific-case worksheets that walk you through a single concrete scenario.

Every framework, decision filter, and figure used in these worksheets is drawn from the chapters of the source book. The book sets the diagnosis, the worksheets give you the form to act on it.

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Read the source book on Google Play Books:

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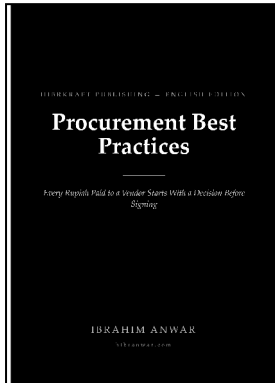
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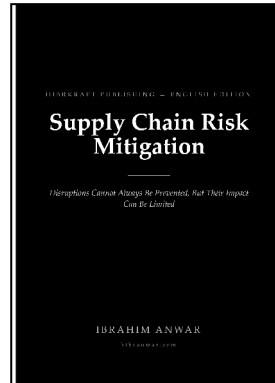


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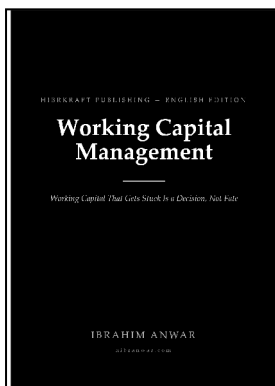


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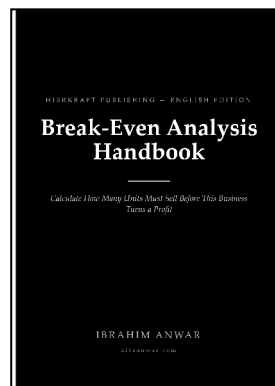


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