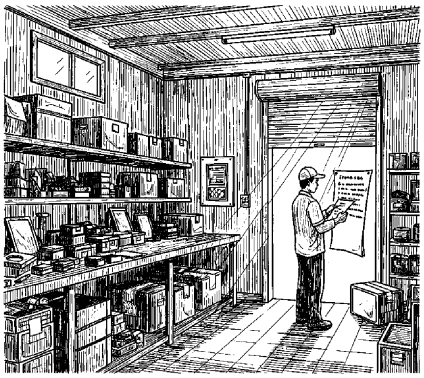
SPECIFIC-CASE

WORKSHEET 7 OF 9

Rapid Cell Rebuild When Order Volume Doubles

Scenario: a confirmed order intake increase of 90–110% arrives within four weeks — a new contract, a seasonal surge, or a wholesale channel opening. Current cell layout and staffing was designed for previous volume. Shipping the old layout into double demand will not produce double output; it will produce queues, rework, and missed delivery promises.



Complementary worksheet for

SECTION 1

What This Is For

A structured decision sequence for redesigning an operational cell in response to confirmed demand doubling, without recruiting by instinct or rearranging furniture by feel. When volume doubles, every assumption baked into the current layout — tool positions, staffing ratios, approval thresholds, takt time — becomes invalid simultaneously. This worksheet runs each assumption through an explicit check before any action is taken.

The sequence matters. The most common failure mode when volume doubles is adding headcount at the wrong stage because queues are visible there — without checking whether those queues are caused by that stage's own bottleneck or by a constraint upstream. A cell rebuilt around the correct bottleneck, with offloaded non-bottleneck work and updated standards, can absorb double demand with one new hire. A cell rebuilt around the visible queue, with staffing added to the wrong function, produces the same lead time at double the labor cost.

SECTION 2

Benefits

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

- Forces a takt time recalculation at new volume before any layout or staffing decision, preventing investment at the wrong constraint.
- Identifies non-bottleneck work currently done by the bottleneck person — often the fastest way to free effective capacity without adding a position.
- Produces a named owner and deadline for every decision point in the rebuild, preventing the rebuild from stalling at the discussion stage.
- Includes a 5S check for the new layout before marking it permanent, avoiding the cost of re-marking shadow positions twice.
- Establishes a ten-order post-rebuild measurement that confirms whether the new layout has actually absorbed the volume or created a new constraint.

SECTION 3

Framework To Use

— Double-Volume Rebuild Sequence

Eight decision points in fixed order. No decision at point N+1 until point N is filled. The sequence prevents rework.

1	1 — Name the current bottleneck stage before any volume change (queue location, not assumption)
▼	
2	2 — Recalculate takt time at new volume (net available time ÷ new orders per day)
▼	
3	3 — Compare bottleneck cycle time against new takt time (gap = the decision driver)
▼	
4	4 — List non-bottleneck work at bottleneck. Offload what can move. Recalculate gap.
▼	
5	5 — Decide layout change: is the physical arrangement still valid at double throughput?
▼	
6	6 — Update work standards to reflect new step sequence and new time targets
▼	
7	7 — Identify cross-training need: who covers the bottleneck if the primary person is absent?
▼	
8	8 — 5S the new layout in one day before it becomes the permanent arrangement

SECTION 4

How To Use

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

1. Fill each row in order. Do not skip ahead — later decision points depend on earlier findings.
2. Row 1 — Bottleneck at current volume: name the stage, not the department. 'Data entry desk' is more useful than 'admin.' Use direct observation or queue location, not reports.
3. Row 2 — Takt time at new volume: calculate net available time ÷ new orders per day. Write the result in minutes per order.
4. Row 3 — Gap: subtract takt time from current bottleneck cycle time. A positive number is the gap the rebuild must close.
5. Row 4 — Non-bottleneck work at bottleneck: list every activity the bottleneck person does that someone else could do. Estimate minutes per day. Write where each item moves.
6. Row 5 — Layout change: does the physical arrangement — tool positions, staging areas, flow path — still support the recalculated cycle time? If yes, mark shadow positions for the new volume. If no, sketch the revised layout before moving anything.
7. Row 6 — Work standard update: does the existing one-page standard still reflect the step sequence and time target at new volume? Update before the rebuild is called complete.
8. Row 7 — Cross-training: at double volume, the bottleneck person cannot be a single point of failure. Name who can cover and what training they need.
9. Row 8 — 5S check: can the new layout be shadow-marked and photographed in one working day? Do this before the layout is treated as permanent.
10. After rebuild: measure lead time for the first ten orders at new volume. Write the average. Compare against pre-surge average.

SECTION 5

Example Use

A garment finishing workshop operating at 80 pieces per day has just signed a wholesale contract that brings volume to 160 pieces per day starting in three weeks. The owner fills this sheet on the day the contract is confirmed.

Row 1 — Bottleneck at current volume: the steam pressing stage. Queue of 12–18 pieces visible in front of it every afternoon. One press, one operator.

Row 2 — New takt time: 450 minutes ÷ 160 pieces = 2.81 minutes per piece.

Row 3 — Current bottleneck cycle time at pressing: 3.4 minutes per piece. Gap: 3.4 minus 2.81 = 0.59 minutes. Positive — bottleneck cannot sustain new volume.

Row 4 — Non-bottleneck work at pressing: the press operator also threads hanging tags (estimated 25 minutes per day at current volume, approximately 0.31 min per piece). After offloading to the QC table: recalculated cycle time = 3.4 minus 0.31 = 3.09 minutes per piece. Gap still positive: 3.09 minus 2.81 = 0.28 minutes per piece.

At 160 pieces, the remaining gap is 160 × 0.28 = 44.8 minutes per day. Owner decision: rent a second pressing iron ($38/month), assign to a junior operator who currently assists at the packing table. New combined capacity at pressing: estimated 2.5 minutes per piece with two irons and two operators working in parallel.

Row 5 — Layout: current pressing area fits two irons side by side. Shadow positions need updating for second iron position. No wall changes required.

Row 6 — Standard: updated to include two-operator pressing protocol (sequencing to avoid steam conflict). Updated and posted same day as second iron arrives.

Row 7 — Cross-training: senior packer cross-trained on pressing protocol in case of absence. 2-hour session scheduled.

Row 8 — 5S: new layout shadow-marked in 4 hours on the Saturday before the first large order week. Standard condition photo taken.

Post-rebuild measurement: first ten orders at new volume averaged 3.1 days lead time versus 2.8 days pre-surge. Within 20% — acceptable. Second week dropped to 2.9 days as operators stabilized in new arrangement.

SECTION 6

The Worksheet

Tear this out, copy it onto a fresh sheet, or fill it in directly.

Rapid Cell Rebuild When Order Volume Doubles

Scenario: a confirmed order intake increase of 90–110% arrives within four weeks — a new contract, a seasonal surge, or a wholesale channel opening. Current cell layout and staffing was designed for previous volume. Shipping the old layout into double demand will not produce double output; it will produce queues, rework, and missed delivery promises.

DECISION POINT	CURRENT STATE	TARGET STATE (POST-REBUILD)	ACTION REQUIRED	OWNER	DEADLINE
Bottleneck stage at current volume					
Takt time at new volume (recalculated)					
Cycle time at bottleneck vs new takt time					
Non-bottleneck work to offload from bottleneck					
Cell layout change required? (Yes / No)					
Work standard update required? (Yes / No)					
Cross-training need: who covers bottleneck?					
5S: can new layout be marked in one day?					

SECTION 6 (CONTINUED)

Reflection Prompts

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

1. Before approving any recruitment: calculate effective capacity at the bottleneck after offloading non-bottleneck work. Write the number. Does it meet the new takt time? If yes, hold the hiring decision for two weeks.

2. After the rebuild, measure lead time for the first ten orders at new volume. Write the average. Compare against the pre-surge average. If lead time has risen by more than 20%, identify which stage is the new constraint.

SECTION 7

Tips and Traps

TIPS

- Complete the worksheet the day the volume increase is confirmed, not the week before it arrives. The worksheet takes 90 minutes. Acting on bad assumptions for three weeks costs more.
- When calculating takt time at new volume, use the actual confirmed daily order count, not a peak estimate. Calibrating to peak volume produces a system over-resourced for normal days.
- The 5S step (Row 8) should happen before the first high-volume order is processed, not after. A layout that becomes habitual before it is 5S-marked is harder to adjust.
- Cross-training (Row 7) should be completed before the first week at new volume, not scheduled for 'when there is time.' At double volume, there is never time.

TRAPS

- Adding staff at the stage with the longest visible queue without checking Row 4 first. The queue may be caused by upstream constraints, not by the stage's own capacity.
- Updating the layout without updating the work standard. A new physical arrangement with an old work sequence standard produces confusion in the first week and deviation in the second.
- Treating the post-rebuild ten-order measurement as confirmation even if lead time is more than 20% above pre-surge average. A greater-than-20% rise means the rebuild created a new constraint — identify it before week two.

SECTION 8

Appendixes

Appendix A — Quick Capacity Math for a Double-Volume Rebuild

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Step 1: New takt time
  Net available time (min/day) ÷ new orders per day = ____ min/order

Step 2: Current bottleneck cycle time
  Measured by direct observation: ____ min/order

Step 3: Gap
  Cycle time minus takt time = ____ min/order
  Total daily gap = gap × new orders per day = ____ min/day

Step 4: Offloadable time at bottleneck
  Sum of non-bottleneck activities × (new orders per day) = ____ min/day
  Recalculated cycle time = current cycle time minus (offloadable ÷ orders) = ____

Step 5: Residual gap after offloading
  Recalculated cycle time minus new takt time = ____
  Positive = resource addition needed. Negative = hold hiring decision.

Step 6: Cost of residual gap vs. cost of one hire
  Residual gap (min/day) × hourly labor cost ÷ 60 = daily cost of unmet capacity
  One additional part-time hire daily cost = ____
  Compare. If hire cost < 3 × unmet capacity cost: hire is justified.
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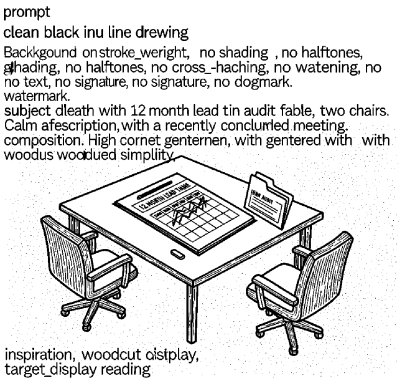

WHERE THIS WORKSHEET COMES FROM

Lean Operations Principles

Eliminate Waste Before Adding Capacity

by Ibrahim Anwar

This worksheet is one of nine in the *Lean Operations Principles* 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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