

OPERATING CASE / OC03

Supply Chain Innovation

Coordinate technical transfer, constrained resources and start of ship

A Luna Sol operating design for product change: translate commercial ambition into a versioned release, feasible production and distribution, and a customer-level commitment.

PRODUCT CHANGE AND LAUNCH READINESS / ILLUSTRATIVE OPERATING SCENARIO

BLUF / BOTTOM LINE UP FRONT

Protect the customer promise.
Price the full launch path.

MODEL-DERIVED DECISION

The staged plan costs \$9,160 and meets every original customer date. Full early dispatch costs \$10,380, but the strongest simple alternative costs \$9,280: only \$120 of modeled headroom.

PROPOSED ENGAGEMENT RESPONSIBILITY

Proposed Luna Sol role: cross-functional planning, resource decisions, release coordination and handoff.

EVIDENCE STATUS

Invented scenario and USD figures. Reproducible model; no client launch or realized benefit claimed.

IS: illustrative scenario | MR: model result | PD: proposed design | RB: primary research. Proposed engagement design with reproducible analysis.

Make the commercial promise executable

Context [IS]. A business unit is changing a product supplied in standard and promotional packs. Commercial teams want an early start of ship while technical transfer, material availability and production share scarce resources. The worked scenario retains twenty original pallet obligations and their customer due dates across five modeled weeks. It is a new illustrative decision, not a reconstruction of a client launch.

Objective [PD]. Select an executable launch path that protects the original customer promise at the lowest comparable modeled cost. Join the exact product configuration to technical acceptance, material, manufacturing, dispatch and customer delivery. The supply-chain lead coordinates the choice; commercial owners approve commitments and qualified specialist owners authorize technical release.

Approach [MR/PD]. Enumerate 830 feasible policies across readiness slots, early quantities, production capacity and supplier reservations. Preserve every original pallet, including its receipt, acceptance, production, shipment and delivery events. Compare a staged plan with reoptimized full-first-wave dispatch and a strong no-reservation alternative. Then connect the decision to cross-functional controls, sensitivity, information value and prospective measurement.

Findings [MR]. Advancing only the six standard-pack pallets costs \$9,160. Dispatching all ten first-wave pallets early costs \$10,380 after reoptimization. Both meet every original customer deadline. A simpler plan waits until week three and expedites the standard pallets outbound for \$9,280, leaving only \$120 advantage for the selected reservation plan. Earlier dispatch is therefore not the same as better customer service, and the weak comparator would overstate the purchase headroom.

Decision value [PD]. Confirm whether the business needs the original customer dates or the stricter all-format early-dispatch promise. Under the original dates and declared prices, advance standard packs only. Do not buy extra transfer and production capacity to improve a milestone with no priced customer benefit. Validate the \$120 margin against actual resource, material and transport conditions before committing.

Implications [PD]. Release is a version-specific decision, not a color on a launch dashboard. A technically valid plan can still be commercially inefficient, and a cheaper plan cannot waive a release gate. Preserve the strongest feasible comparator and mature customer obligations when evaluating the operating approach.

IS = illustrative scenario; MR = model result; PD = proposed design; RB = primary research. All model quantities, USD costs and probabilities are invented; operating responsibilities describe the proposed engagement.

Exhibit 1 | Turn the launch promise into an operating obligation

[PD] The supply-chain lead represents what the business can execute inside the brand or category team. Start with the commercial decision: which product configuration, customer group, market and ship window are being promised, and what volume is committed rather than forecast. Marketing may want one campaign date; Sales may already have customer orders; R&D may still be changing the product. These are different obligations. Join them before asking a plant to confirm a launch.

Input owner	Required decision record	Supply-chain consequence
Marketing	Campaign scope, claims and the decision date for changes	Freeze the configuration and distinguish desired timing from accepted obligations
Sales	Original customer orders, requested dates, quantities and permitted substitutions	Retain the service population and authorized priority rule
R&D / quality	Product, pack and process version with required specialist release	Determine what can be transferred and which evidence must be renewed
Supply chain	Material, people, production and distribution capacity by time	Offer a feasible volume/date choice with full cost and unresolved gates

Build one launch charter with an accountable sponsor and named functional owners. Record the original demand frame, decision deadlines, resource assumptions and criteria for release. An order moved to a later promise date remains late against its original date for evaluation, even if the customer accepts the revised plan. Show the amended commitment separately. Added customers and promotional upside belong in separate demand scenarios rather than being inserted into the original denominator after results are known.

At feasibility, present alternatives in business language: retain the date with a smaller authorized assortment, stage the commercial promise, buy a qualified capacity option, or move the date. Include who loses service under each choice. A plan is not feasible merely because its total volume fits an annual forecast; it must fit the release sequence and the actual constrained weeks. The sponsor chooses commercial priorities, while technical and quality owners retain release authority.

The concrete first handoff is a signed demand-and-configuration packet, not a presentation of aspirations. Supply chain returns a dated commitment or a qualified alternative; Sales confirms what can be communicated to customers; Marketing aligns campaign material to the released scope. Preserve the rejected option and reason so the same unsupported promise does not reappear in another meeting.

Source basis: proposed response to the supplied innovation-management opportunity. The charter and owner model are a design, not records of an executed client launch. The worked model uses a separate invented demand and capacity frame.

Exhibit 2 | Advance the format that protects the due date

[IS] The original first wave requests six standard pallets due in week 3 and four promotional pallets due in week 4. A later ten-pallet cohort is due in week 5. Common configuration acceptance uses one of two week-1 technical slots; each early format needs another slot. Both formats early therefore require paid extra support. Production may begin only after the applicable acceptance week.

BEST DECLARED POLICY / ORIGINAL 20 PALLETS

	1	2	3	4	5
Format acceptance	S	P			
S production + dispatch		6		4	
P production + dispatch			4	6	
Customer delivery			6	4	10

Gold: assumed acceptance. Green: pallet quantities, not consumer counts.

Ground transit is one week. All original due dates remain unchanged.

[MR] The selected plan accepts standard packs in week 1 and promotional packs in week 2. Six reserved standard pallets manufacture and dispatch in week 2, arriving by ground in week 3. The four promotional pallets manufacture and dispatch in week 3, arriving in week 4. The later cohort manufactures in week 4 and arrives in week 5. No customer deadline is changed or omitted.

[MR/PD] Week-2 production uses six of eight pallets of base capacity, so it does not require the optional four-pallet addition. Only standard packs need early material. The plan preserves technical and physical capacity for what changes the delivery path, rather than treating every format as equally urgent. It assumes all acceptance gates pass and transit takes the declared time; actual evidence must replace those assumptions before execution.

Source: frozen synthetic inputs and the best policy’s original-pallet ledger. Common configuration acceptance ends in week 1. Each week contains receipt, manufacture, assumed lot release and dispatch in that order; customer delivery is a distinct later event.

Exhibit 3 | Use the strongest feasible cost comparator

[MR] All three plans below deliver all twenty original pallets by their unchanged customer due dates. The full-first-wave plan additionally ships both formats in week 2; that is a stricter commercial choice, not a requirement embedded in the original customer dates. Each restricted alternative is reoptimized over its feasible actions.

Modeled cost, USD	Standard staged	All first wave early	No early dispatch
Product, pack, conversion, base freight and common transfer	\$7,100	\$7,100	\$7,100
Format setups	\$320	\$320	\$320
Dispatch waves	\$540	\$360	\$360
Supplier reservation	\$1,200	\$1,200	\$0
Inbound / outbound premiums	\$0 / \$0	\$500 / \$0	\$0 / \$1,500
Extra transfer / production	\$0 / \$0	\$600 / \$300	\$0 / \$0
Total delivered cost	\$9,160	\$10,380	\$9,280

[MR] Relative to full early dispatch, staging avoids \$600 of extra transfer, \$300 of extra production and \$500 of inbound air, but adds a \$180 dispatch wave: a net difference of \$1,220. Relative to the stronger simple plan, it replaces \$1,500 of outbound expedite with the \$1,200 reservation plus the extra \$180 wave. Its net headroom is only \$120. No revenue, market-share or brand benefit is priced.

[PD] The launch sponsor should ask which promise is commercially binding before paying for full early dispatch. If the campaign genuinely requires both formats in week 2, its \$10,380 plan may be the appropriate feasible choice. The model cannot dismiss an unpriced benefit or invent one. If original customer dates govern, the staged plan is cheaper under the declared inputs, with a narrow margin against a simpler option.

Source: exact finite result. Common costs remain in totals; differences are conditional avoidable costs, not realized cash savings or profit. All gates and transport outcomes succeed by assumption.

Exhibit 4 | Transfer the configuration that will actually ship

[PD] Use the proposed Configuration-to-Ship Readiness Contract (CSRC) as an operating protocol. It connects the original launch obligation, an exact product/pack/process version, receiving-site evidence, delegated release and later order performance. A successful prototype or an approved specification is necessary evidence for some decisions; neither proves that a receiving plant can repeatedly make the shipping configuration.

Gate	Concrete evidence	Accountable decision
Configuration	Aligned specification, formulation or bill of material, artwork and revision identities	R&D and the appropriate quality or regulatory owner approve the applicable version
Transfer	Receiving equipment, process instructions, critical settings and operator practice match the intended design	Manufacturing engineering and the receiving operations owner accept transfer
Release	Required tests, deviations, traceability and distribution conditions are resolved for the exact lot/version	Delegated release authority permits disposition
Change after approval	Affected products, materials, tests, labels, orders and records are identified	Change owner obtains the required renewed decisions before use

The technical-transfer packet should let the receiving team explain how it will produce, inspect, identify and route the item without the developer improvising the missing steps. Include characteristics that matter to the intended use, measurement methods, acceptance limits, line settings and the response to an out-of-limit result. Qualified specialists define these requirements; this case supplies no product-safety, engineering or regulatory certification.

Use a change-impact map instead of a single global “approved” flag. If artwork changes after a transfer trial, the prior equipment result may remain relevant while label verification and customer master data need renewal. If a material or process changes, prior yield and stability evidence may no longer apply. Keep the earlier result attached to the configuration it tested. Copying its green status onto the new version would hide the reason for the test.

At the decision meeting, each owner signs only the domain they can authorize. The project manager assembles the packet, exposes missing evidence and updates the executable plan. They do not convert a missing specialist decision into a manageable risk by changing its color. The next task starts only when its actual prerequisites are available; a forecast approval date is not a completed predecessor.

Proposed technical-transfer design. Modeled release or acceptance flags elsewhere are assumptions, not observed test results. Actual product, jurisdiction, customer and receiving-site requirements must be established by their authorized specialists.

Exhibit 5 | Protect the conversion from material commitment to usable stock

[PD] Sourcing converts a design choice into commitments that can outlive the launch plan. Before placing an order, reconcile the approved component or pack version, supplier qualification, lead time, minimum quantity, delivery terms and the latest date for changing the commitment. A quoted saving per unit can be outweighed by obsolete packaging, stranded material, expedited freight or stock that cannot be released.

Decision	Evidence needed	Owner and disposition
Commit the purchase	Current released requirement, demand basis, supplier readiness and authorization	Sourcing commits only the approved version and quantity
Accept the receipt	Purchase identity, supplier lot, quantity, condition and required inspection	Receiving and quality retain any blocked stock separately
Convert old to new	Authorized last-use rule, substitute rights and traceable inventory by version	Planning proposes the runout; quality and commercial owners approve applicable choices
Resolve excess	Usable, recoverable, returnable and obsolete quantities kept distinct	Finance and inventory owners determine actual disposition and value

Give old and new material separate identities even when they serve the same market purpose. Plan the last old-version order, last permissible production use and first new-version receipt together. If a delayed launch leaves both versions on hand, do not describe the second purchase as incremental customer demand. Retain the old stock, its disposition and associated work in the launch economics. A cancellation right is a contract fact to verify, not an automatic recourse action.

Synchronize scarce supplier-development, testing and planning resources with the launch schedule. A buyer can obtain an early delivery date while the receiving team has no approved inspection method or available storage. The relevant constraint is usable inventory at the required time and configuration. Escalate the whole consequence: release dependency, capacity displacement, cash commitment and potential obsolescence, with a named owner for each assumption.

At handoff, the ongoing planner receives open purchase commitments, versioned inventory, supplier exceptions and the next replenishment rule. Finance receives the bridge from committed purchase value to received asset, expense or recovery as applicable. These are different quantities. Do not count an inventory reduction as profit, a favorable quote as paid savings, or the same avoided expedite in both total delivered cost and a separate benefit line.

Proposed sourcing and conversion controls. The finite scenario prices only its declared cost components; it does not establish supplier performance, inventory accounting treatment or a full landed-cost estimate for a real launch.

Exhibit 6 | Reconcile production release with distribution readiness

[PD] A launch can leave the line on time and still miss the customer. Join production, release, allocation, warehouse handling and dispatch as distinct events. Record the exact lot and configuration as it moves through each gate. Finished stock that has not met the release conditions cannot be treated as available-to-promise merely because it occupies a pallet location.

Operating point	Evidence and stop condition	Owner
Production start	Released materials, current instructions, qualified people and available line time; hold if a prerequisite is absent	Production with quality and engineering
Lot disposition	Quantities reconcile to released, held for rework, otherwise held or scrapped; track rework events separately. Unresolved quality is not supply	Authorized quality owner
Distribution activation	Item/pack hierarchy, order rules, handling requirements and destination records match the released configuration	Distribution lead and master-data owners
Customer handoff	Shipment identity, original order, quantity and required delivery evidence remain linked	Customer service and distribution

Before start of ship, rehearse one end-to-end order path in the authorized environment. Create the order using the current customer and item data, reserve the correct stock, execute the relevant warehouse steps and verify what the customer-facing message says. Deliberately examine a held lot, short quantity and rejected interface record where these paths exist. The rehearsal tests control behavior; it is not a statistical claim that every future order will succeed.

Protect the established business while the launch consumes shared capacity. Reserve actual line, maintenance, quality, warehouse and planning time rather than counting the same people in several local plans. Show any displaced replenishment or customer work. A new-product service gain bought by unreported misses elsewhere is not a portfolio improvement. The finite model demonstrates only the resource interactions it explicitly includes; the live capacity map must cover the relevant remaining work.

If release slips, reconcile all affected orders before choosing a workaround. A substitute, alternate route or staged quantity needs its own permission and supporting evidence. Retain the original promise for measurement and record the authorized revision for execution. When the launch stabilizes, transfer the open exceptions and monitoring responsibility to operations; do not make the project disappear while distribution still relies on informal expediting.

Proposed operating sequence. "Start of ship," dispatch and mature customer fulfillment are different milestones. Transport time, damage, returns and customer acceptance must be measured separately unless an explicit model includes them.

Exhibit 7 | Make the commercial promise follow the release decision

[PD] Run the launch control room around decisions, not a roll-up of green workstreams. The supply-chain lead maintains one dated view of original obligations, release evidence, usable supply and constrained resources. Functional owners bring the exception they need resolved, the consequence of waiting and a feasible next action. The sponsor resolves commercial tradeoffs; the technical owner retains authority to stop an unreleased configuration.

Trigger	Decision and owner	Evidence retained
Demand or campaign changes	Commercial sponsor chooses a revised scope or priority; Sales approves customer communication	Original versus amended obligation and affected capacity
Technical gate fails	R&D / quality determines repair, retest or rejected disposition	Failed characteristic, version, containment and renewed evidence
Shared resource conflict	Supply-chain sponsor approves resequencing or qualified capacity	Feasible alternatives, displaced work and full incremental cost
Released supply cannot serve the order	Customer-service owner routes an authorized recovery	Original order, actual supply, permitted substitute and final outcome

Define escalation by consequence and decision latency. A missing marketing asset may alter campaign timing; an uncertain product identity may prevent release; a blocked customer master may prevent invoicing. These are not interchangeable red items. Route each to the person who can change the constraint. Keep an expiry on temporary workarounds and a named reconciliation owner so that urgent manual actions do not silently become the permanent process.

Use a change cutoff tied to actual dependency lead time. After that point, a proposed scope change must show which material commitments, transfer tests, production slots and customer messages need rework. The correct response may be to preserve the original launch and introduce the change later. A stakeholder’s seniority does not make the physical lead time shorter. Conversely, a low-cost change with no affected hard gate should not require a complete restart of every review.

The stop/continue record should state the exact configuration, permitted customers, maximum executable volume, remaining conditions and next decision time. It should never say simply “launch approved.” This creates a usable handoff between commercial intent and operations. The record also preserves decisions that did not proceed, allowing later review to distinguish a prudent hold from a missed milestone caused by avoidable preparation failure.

Proposed governance, not documented use by a client. The launch framework is an operating contract among roles; actual delegation, commercial substitution rights and product-release authority remain organization-specific.

Hand over a working planning capability

[PD] The interim supply-chain manager should leave a repeatable decision process that the business can run. Build it with the functional owners who will inherit it: a current product-change register, a resource-constrained plan, a release packet, an exception queue and a measurement dictionary. Assign one accountable owner to each decision while recording who supplies the evidence and who must be consulted.

Decision right	Accountable role	Interim lead contribution
Commercial scope and promise	Brand/category sponsor with Sales	Translate options into executable quantities, dates and consequences
Technical configuration and release	Delegated R&D, quality and relevant specialist owners	Expose dependency gaps and coordinate the evidence packet
Supply and shared resources	Supply-chain and receiving operations leaders	Maintain the constrained plan and escalate conflicts
Purchase and financial treatment	Delegated Sourcing and Finance owners	Show commitments and full comparable costs without self-approval
Ongoing control and recovery	Receiving functional process owners	Coach execution and confirm accepted handoff

Train through actual decisions rather than only explaining a template. Ask the planner to rebuild the next production commitment from usable inventory and the current release state. Ask customer service to trace an affected order through a permitted recovery. Ask the workstream owner to explain why their next milestone is executable. These demonstrations reveal missing access, ambiguous definitions and unowned interfaces that attendance records will not show.

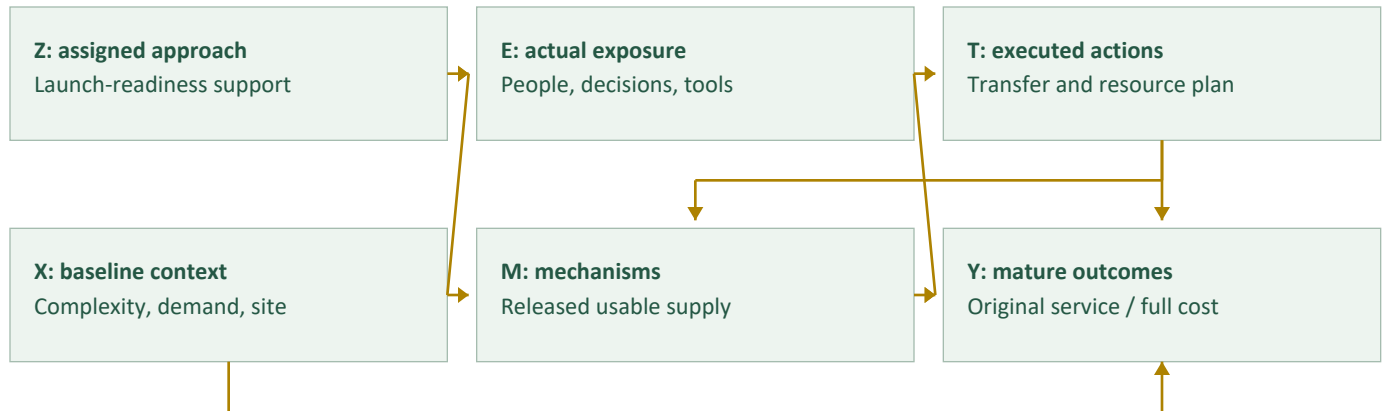
Use a shadow cycle followed by supervised ownership. The receiving team prepares the control-room packet and proposes dispositions; the interim lead checks the reasoning and makes gaps visible. Remove support gradually once the owner can operate the cadence, resolve a routine exception and identify a case that requires escalation. Keep the harder unresolved items in a funded register with an owner and due decision, rather than relabeling them as business as usual.

Close the engagement against deliverables and capability evidence: accepted source definitions, a current plan, named release authorities, accessible records, trained coverage and a handoff accepted by the sponsor. Later service and cost results require continued observation. Agree who maintains the product-change register, updates capacity assumptions and convenes the next exception review after interim support ends.

Role boundary: Luna Sol's proposed contribution is cross-functional operating design, planning, decision coordination and handoff. Product engineering, quality, legal, accounting and system-specific approvals remain with qualified delegated owners.

Separate launch activity from its effect on customers

[PD] This causal map proposes how a future launch-readiness approach might change outcomes. Assignment does not guarantee execution; approved configurations and first shipments are intermediate states. The numerical model represents selected resource and cost pathways under invented fixed inputs. It does not estimate the field effect of an interim manager or the commercial success of a product.



Selection and assignment. Difficult launches may receive more support, while better-resourced teams may adopt the process more completely. Baseline product novelty, site capability and commercial urgency can affect both execution and outcomes. Comparing supported launches with easy unsupported launches would mix the intervention with those differences. Retain every originally assigned launch, including holds and cancellations, with its reason and incurred costs.

Mechanisms and total effects. Version accuracy, usable supply and fewer unresolved interfaces are plausible mechanisms. To estimate a total effect, do not restrict the analysis to launches that passed release or control away post-assignment readiness. Direct E to Y and T to Y paths retain the cost of support, tests, acceleration and remediation even when the product never ships. Customer outcomes also depend on demand, carrier performance and product acceptance beyond the release gate.

Interference and timing. Launches can share a line, specialist or warehouse. One project's acceleration may displace another's capacity, so count the relevant original portfolio and resources. Multiple orders from one launch are not independent launches. Fix a maturity window that can capture late deliveries and relevant returns; retain unresolved outcomes rather than dropping them from the denominator.

Every arrow is a proposed pathway. No client panel, treatment assignment or measured causal effect is supplied. The future design must state its comparison unit, shared-resource boundary and eligible outcome population before claiming an effect.

Exhibit 8 | Buy information only when it changes the action

[Separate hypothetical extension] The base calculation knows the booked capacity is available. Now suppose that capacity may be unavailable. The booking fee is still paid, but prequalified inbound air replaces every affected pallet before production. All 20 original deadlines remain feasible. This uncertainty concerns supplier capacity, not permission to release a product. Every one of the 830 policies is reevaluated in both states.

An optional signal arrives before booking, readiness and production commitments. Its invented sensitivity and specificity are both 80%. A positive signal predicts capacity available. The fee is paid once for the complete original launch, regardless of the signal or chosen action. No signal has been tested, and no real forecast accuracy is claimed.

Prior available	EVPI ceiling	EVSI before fee	Net at \$40 fee
80%	\$96	\$21.60	-\$18.40
92%	\$110.40	\$66.24	\$26.24
98%	\$27.60	\$0	-\$40

All-action comparison leaves two cost-efficient state pairs: selective reservation costs \$9,160 if available and \$10,660 otherwise; no early dispatch costs \$9,280 in either state. With p denoting the probability of availability, the minimum uninformed expected cost is $\min(\$9,280, \$10,660 - \$1,500p)$. Reservation is strictly preferred only above $p=0.92$; at equality the two choices tie.

At the 92% prior, a positive signal raises the availability probability to 46/47 and selects reservation; a negative signal lowers it to 23/31 and selects no early dispatch. Across every prior from zero to one, the maximum EVSI is \$66.24, attained at 92%. The perfect-information ceiling there is \$110.40. At 98%, both signal outcomes select reservation, so this imperfect signal has zero decision value even though perfect information remains worth \$27.60.

The fee sensitivity is decisive: at priors 80%, 92% and 98%, net EVSI at a \$10 fee is \$11.60, \$56.24 and -\$10; at \$80 it is negative in all three scenarios. An \$80 fee also exceeds the \$66.24 maximum over all priors under this exact signal and action law. A positive modeled value is conditional decision support, not a recommendation without calibrated probabilities and verified fallback capacity.

Source: economics.py/json, exact rational Bayes over all 830 feasible policies. All uncertainty and fees are invented. Do not add EVSI to the operating cost benefit for the same decision; known base-state arithmetic has no value from another perfect copy. EVPI = expected value of perfect information; EVSI = expected value of sample information.

Technical analysis | Reoptimize the price and resource choice

[IS/MR] This grid changes the supplier reservation fee and outbound expedite premium while holding all other model inputs fixed. Every cell reoptimizes all 830 feasible policies and retains the same twenty original customer deliveries. These are authored sensitivity cases, not a confidence interval or estimated market-price distribution.

Reservation fee	Outbound \$100 / pallet	Outbound \$250 / pallet	Outbound \$400 / pallet
\$600	Wait / \$8,380	Reserve S / \$8,560	Reserve S / \$8,560
\$1,200	Wait / \$8,380	Reserve S / \$9,160	Reserve S / \$9,160
\$2,000	Wait / \$8,380	Wait / \$9,280	Air-in S / \$9,460

“Wait” makes no week-2 dispatch and expedites the six standard pallets outbound in week 3. “Reserve S” advances those six using supplier-reserved early material. “Air-in S” advances them using inbound air without a reservation. Promotional first-wave pallets remain on the normal week-3 ground path in these winning cells. All three choices are within the original technical and customer rights.

[MR] A \$2,000 reservation and \$400 outbound premium select the third option, inbound air, at \$9,460. Comparing only “reserve” and “wait” would miss it. The stronger simple option therefore changes with prices; one baseline should not be fixed after it becomes inferior. At the base prices, the reservation plan’s advantage over waiting is \$120, so an omitted incremental charge of that amount removes the strict cost preference.

[MR/PD] The enumeration examines 3,360 candidate tuples, rejecting those that violate early-format readiness, production capacity or reservation capacity. It retains 830 complete policies and every pallet event. Some different reservations are cost-equivalent; the published tie-break selects one reproducible representation. The exact result covers this finite family, not every conceivable supplier, plant, assortment or logistics network.

[Verification] The author checks the model’s declared conservation and constraints. A separately authored reconstruction checks the feasible set and decisions without importing the solver. Agreement supports the calculation; actual readiness, safe release, credible capacity and reliable transit still require operating evidence.

Source: `inputs.json/results.json`, privately retained. “Air-in S” uses the fixed \$250 inbound premium; it does not change the customer due dates or substitute a legacy product.

Measure the original promise, not the first shipment

[Proposed design] The Configuration-to-Ship Readiness Contract (CSRC) starts with the original launch obligation: customer, product/configuration, quantity, customer delivery due date, planned ship window and permitted substitution. Link that obligation to the accepted specification, packaging revision, receiving site, material and finished-product lots, release evidence and dispatch record. Preserve the original obligation when production is held, the launch is staged or a later order is created. A changed commercial promise is recorded as a separate decision, not a repaired historical denominator.

[Research basis] NASA treats transition as a readiness problem involving the receiving site, people, documentation and enabling resources, as well as the product. This is an engineering analogy, not consumer-product certification. GS1 distinguishes product-class identity from finer lot or instance traceability and separates transformation from shipping events. Neither a complete join nor a scanned identifier proves conformity or release authority. [R1,R2]

Construct	Decision measure and boundary
Release readiness	All applicable configuration, technical and authorized-release conditions satisfied for the actual lot/site; unknown remains unresolved.
Launch service	Modeled quantity delivered by its original due week divided by all 20 original pallets. In live data, dispatch alone cannot substitute for receipt evidence.
Delivery-horizon disposition	Track original quantities as timely, late or outstanding through week 5. The model requires full timely delivery; customer acceptance and returns remain outside it.
Resource burden	Incremental change, production, holding and disposal costs in the declared horizon; distinguish inventory assets, expense and cash.

[Analytical inference] First shipment is an event time, not an assurance of launch volume. A small released lot can establish start-of-ship while most original demand remains late. Conversely, a deliberate hold can protect product integrity while worsening service. Publish both dimensions. Do not score a faster date as success when it refers to the wrong configuration, an unauthorized substitute or a smaller customer cohort.

[Illustrative scenario] The finite model keeps four original orders and 20 pallets, with fixed customer due weeks. Ground transit takes one week and approved expedite takes zero; technical and lot gates always pass by assumption. Every admissible plan must deliver the full original cohort on time through week 5. This is modeled customer delivery, not an observed receipt series or mature commercial result. Cost differences are conditional calculations, not measured effects. Live evaluation must separately evidence dispatch, receipt, acceptance and relevant returns, retain held stock and unfilled demand, and avoid duplicate credit for split shipments.

Evidence of technical release and actual transport performance must replace the modeled assumptions before operational use.

Qualify the transfer before estimating the launch effect

[Proposed design] Use three gates. First, verify the plan: correct prerequisites, resource conflicts, lot compatibility and original-date arithmetic. Second, qualify the actual transfer: receiving-site execution, approved test methods, trained operators, intended equipment and material, package identity and acceptance by the responsible specialists. Third, follow the original customer cohort through dispatch and, separately, later receipt and acceptance. A deterministic schedule that assumes acceptance has passed only the first gate; it is not a record of successful tests.

[Research basis] Apply the actual GS1 identity rule to the specific change and packaging hierarchy. A formulation change does not automatically imply the same identification decision as a net-content, dimensional or promotional change. Master-data agreement between parties is necessary where the change requires it, but it does not replace technical approval. [R3]

[Proposed design] Before commercial release, run authorized challenge cases covering configuration mismatch, incomplete lot genealogy, stale approval, late material and shared-resource contention. Have an independent reviewer reconstruct the reference disposition from the evidence available at the decision time. Retain both false releases and unnecessary holds, including unresolved references; do not report the fraction of scripted checks passed as a field failure rate. A critical known defect blocks release regardless of projected financial benefit.

[Proposed design] For safe alternatives requiring empirical comparison, use representative transfer campaigns or production runs. Block by preassignment material lot, line and planned operating conditions; randomize eligible sequence where carryover can be controlled. NIST provides the blocking rationale. Count independent campaigns, not every item in a correlated lot, as the primary replication unit. Shared crews, learning and common supplier shocks require broader clustering or a redesigned comparison. One product launch or one successful pilot cannot supply a causal portfolio estimate. [R4]

[Proposed design] Define the economic hurdle before sampling and use the same service endpoint and floor for both alternatives. A paired campaign contrast should include failed starts, rework and paid change resources. Estimate variance in a separate calibration phase, then size fresh validation to distinguish benefit from the hurdle. A positive estimate or a confidence interval excluding zero can still fail the purchase decision. A precision screen requires defensible outcome, hurdle, variance and replication inputs; otherwise the prospective evaluation remains unpowered. Assumed planning values are not achieved power or technical acceptance.

Do not adjust a total launch-effect estimate for realized release delay or attained yield: these may be treatment-created mediators. Prespecify baseline complexity and planned timing as moderators.

Three propositions that a staged launch can disprove

[Proposed design] CSRC is a testable operating contract, not a claim that a gate checklist improves every launch. Freeze the candidate action set, original demand, configuration evidence and specialist decision rights before comparing policies. Publish the cheapest feasible alternative as well as the fastest first shipment. Separate failure of a proposed invariant from statistical uncertainty about improvement.

Proposition and mechanism	Evidence that changes the decision
P1: A release record valid for one configuration is insufficient for a materially changed configuration. Revalidation follows the affected dependency.	A controlled version change must invalidate affected acceptance evidence until the appropriate authority reassesses it. One unsupported release falsifies the control invariant; unrelated edits need not invalidate all evidence.
P2: Earlier first shipment is not sufficient to select the better plan. Constraints and transit mediate original-cohort delivery.	Keep original demand and dates fixed. A later-start alternative with equal full delivery at lower total cost refutes first-shipment ranking as a sufficient rule; more timely volume is another possible counterexample, not an assumed result.
P3: Selectively advancing standard packs can lower total cost versus an all-early launch without reducing on-time delivery. Promotional packs retain a later ground route.	Test the original 20-pallet frame with its fixed transit and due weeks. Compare avoided expedite and readiness/capacity costs with extra dispatch/setup costs. A service loss or no cost advantage contradicts this mechanism prediction under the stated boundary; changed route rights require a new test.

[Analytical inference] A staged launch creates a selection risk if only easier products, customers or lots enter the reported success measure. Retain deferred original demand and report prespecified strata. Do not compare a selected easy launch with a difficult prior campaign and attribute the gap to the method. If worst-performing lines are selected, untreated repetition or an appropriate comparison is needed to separate recovery from regression to the mean; no reliability coefficient is estimated here.

[Proposed design] There is no observed operating panel in this case. Static plans and engineered capacity ramps do not justify historical SPC claims. Future ordered, comparable batch observations may support phase-specific tentative XmR diagnostics after checking dependence, mix and measurement stability. Rate charts require genuine eligible counts and a defensible subgroup model; a large denominator alone does not justify Laney adjustment. A signal is not proof of launch causality, and an in-limit observation is not proof of readiness.

Transportability depends on actual product risk, shelf life, material substitution, supplier capability, channel obligations and shared resources. The model does not qualify a product, establish release authority or measure a financial result.

Can future evidence resolve the reservation fee?

[Recalculated model] Compare selective standard-pack advancement with the strongest simple no-early-dispatch plan, preserving the same original 20-pallet customer-delivery requirement. The gross advantage before the reservation fee is \$1,500 of avoided outbound expedite less \$180 of extra dispatch: \$1,320. Paying the frozen \$1,200 reservation fee leaves only \$120. The relevant field question concerns that narrow margin, not the larger difference from the all-early commercial promise.

[Proposed design] If future comparable campaigns have variable costs, measure the gross paired difference including failed starts and extra work, excluding only the fee being tested. Require the lower endpoint of a two-sided 95% confidence interval to exceed \$1,200. This is a positive-tail hurdle test at one-sided alpha 2.5%; merely excluding zero is insufficient. Both paths must satisfy authorized release and the prespecified delivery requirement. Economic clearance cannot substitute for either.

[Planning assumptions] Assume a true future gross mean of \$1,320 only for this screen, with independent matched-campaign-pair standard deviations of \$150, \$300 or \$450. These are uncalibrated scenarios, not observed variance. Under the fixed-SD normal approximation, $n = \text{ceiling}\{[(1.960 + 0.842) * SD / (\$1,320 - \$1,200)]^2\}$ pairs gives at least 80% hurdle-clearance power.

Assumed pair SD	Independent pairs	Gross mean needed for 80%	Power at \$1,320
\$150	13	\$1,316.55	82.2%
\$300	50	\$1,318.86	80.7%
\$450	111	\$1,319.66	80.2%

[Analytical inference] At SD \$300, 16 pairs require a gross mean of about \$1,410 for 80% power and have only 35.9% power at \$1,320. Fifty pairs meet the assumed screen. If feasible, randomize qualified alternatives within matched pairs of campaigns and preserve each original demand cohort; shared suppliers, crews or learning can require a broader unit. Calibrate variance separately. Estimated SD and small samples require suitable inference and may increase sample size.

One current launch cannot supply 13, 50 or 111 independent pairs. Known deterministic prices and quantities need factual validation, not a manufactured statistical test. If replication is unavailable, retain uncertainty or redesign with justified variance reduction. No achieved power, joint service/quality power or field benefit is claimed; the separate supplier-availability scenario remains hypothetical.

Measure the obligation after the launch meeting ends

[PD] Freeze the original launch and customer-order frame before reporting progress. Preserve cancellations, substitutions, split shipments and revised dates with their disposition. Report added demand separately. The control dictionary must specify the configuration, unit, scope, event time, maturity rule, source and accountable owner for each measure. Similar names such as ready, released and shipped must not share one status field.

Measure	Definition and basis	What it can decide
Configuration readiness	Required evidence accepted for the exact product/pack/process version and receiving scope	Whether the next dependent task may proceed
Start of ship	First authorized dispatch of the released configuration, with traceable lot/order identity	Whether physical activation occurred; not volume completion
Original-order service	Original quantities delivered or accepted by the original obligation when evidenced; otherwise label dispatch-based fulfillment. Retain late and unresolved work	Whether the launch served the promised population
Delivered cost	Comparable production, sourcing, distribution and change costs on the same original scope; include failed work	Whether the complete approach is economical
Residual exposure	Held stock, obsolete material, outstanding orders and unresolved quality/customer outcomes at horizon	Whether apparent success depends on unfinished work

Keep planned and actual clocks separate. A release forecast is not a signed release; an ERP shipment event is not customer receipt; a recorded receipt is not necessarily acceptance under the customer's terms. Reconcile the required evidence path and label the available endpoint honestly. If the model stops at dispatch, do not rename its service result delivered-on-time performance.

Finance and operations should reconcile the cost bridge together. Compare the same original work, horizon and cost boundary before describing a change as savings. Separate purchase commitments, inventory assets, operating expense, capacity released and cash paid. An order deferred beyond the observation window can lower recorded cost while worsening service; retain that obligation and its later cost rather than counting the timing shift as value.

Use the measures in the operating cadence: readiness governs task release, service governs recovery and total cost governs the next resource decision. Review data defects as operating incidents with a correction owner and version history. The synthetic scenario is a finite decision calculation, not a time series of repeated stable launches. Its rows do not establish control limits, a reliable improvement trend or a field success rate.

Proposed measurement controls. Model endpoints and cost components are defined separately in the worked calculation. A mature commercial outcome still requires observed customer and financial records.

Replace the assumptions before promising a live launch

[IS/PD] The worked decision is exact within a deliberately small model. It shows how scarce resources, release sequence and commercial timing can change the preferred plan. It does not establish how long a real technical transfer will take, how often a test will fail or how much customers will buy. An internal numerical pass confirms conditional arithmetic, not actual readiness.

Boundary	Evidence needed before operational use
Commercial scope	Original order and promotion commitments, accepted substitutions and consequences of delay
Configuration and quality	Applicable version, product-specific acceptance evidence and delegated release authority
Capacity and calendar	Named people and equipment, competing work, material arrival and realistic recovery time
Economics	Comparable full cost, inventory disposition, contract terms and timing on the original population
Customer outcome	Original due dates, fulfillment/receipt evidence, returns or acceptance where relevant, and maturity
Attribution	A defensible comparison before assigning service or cost differences to the proposed approach

A sponsor may rationally choose a more expensive feasible plan to protect a customer obligation omitted from the bounded scenario. Add that requirement as a constraint or a transparent value component and compare the complete alternatives. Do not hide it in an unexplained confidence score. Equally, do not pay to accelerate a task merely because it appears late: establish whether it changes the launch or frees a genuinely constrained resource.

Technical release cannot be traded for a favorable cost result. If a specialist gate fails, the affected configuration remains unreleased until an authorized disposition and required evidence exist. Recovery may mean correction, retest, a qualified alternate or a revised commitment; none is automatically available. Their capacity, time and cost belong in the live plan.

The source is a hiring opportunity, not a record of appointment or delivery. It supplies no client dataset, observed launch benefit, personal CPG tenure, ERP qualification or onsite arrangement. The actual contribution here is a locally executed illustrative model and a proposed operating method. These limitations are preserved so a buyer can assess the reasoning without mistaking a designed engagement for a completed one.

The public artifact contains invented model quantities and anonymized role descriptions. The original opportunity, code, evidence mapping and review records remain in the separate private annex.

Primary research and the case contribution

[Research basis] Primary sources inform the methods and operating design. They do not establish the synthetic findings, certify the local implementation or supply client outcomes.

R1 | NASA | Product Transition [Systems Engineering Handbook, section 5.5: Product Transition](#)

Treat transfer as a package of product, process, people and site readiness; preserve the exact configuration and evidence used for acceptance. NASA engineering practice is adapted as a method. It neither certifies consumer-product release nor supplies specialist authority or client performance evidence.

R2 | GS1 | Global Traceability Standard [GS1 Global Traceability Standard](#)

Join material lots, produced lots, configuration versions and original customer demand through actual transformation and shipment records. Traceability records do not prove product conformity, test validity, release authorization or physical delivery. No claim of a standards-certified system.

R3 | GS1 | GTIN Management Standard [GTIN Management Standard](#)

Require an authorized assessment of item and packaging identity plus trading-partner master-data readiness for the actual change. Do not infer that every formulation change requires a new GTIN or that a new GTIN authorizes release. Applicable local requirements and qualified review remain separate.

R4 | NIST/SEMATECH | Randomized block designs [e-Handbook of Statistical Methods, section 5.3.3.2: Randomized block designs](#)

For safe replicated transfer trials, block by material lot or line and randomize eligible treatment order; analyze at the independent campaign or shared-resource level. The method does not randomize away configuration risk, qualify a product or make many correlated units independent. A single launch provides no automatic causal effect estimate.

[Case contribution] CSRC joins the commercial promise to the exact released configuration and executable supply path. The worked decision shows that the strongest simple alternative leaves only a small cost margin, while full-format early dispatch purchases a stricter milestone. Primary methods support the interpretation; they neither validate the invented costs nor establish client history.

Internal referee and the next sponsor decision

Contribution. This operating case makes the handoff from commercial ambition to executable supply explicit. It connects a fixed product version and original customer obligation to constrained resources, specialist release, dispatch and mature service. The finite calculation supplies a decision that can be independently reconstructed; the operating pages describe how its assumptions would have to be earned in a real launch.

Review issue	Resolution and remaining boundary
Milestones mistaken for outcomes	Separate configuration release, first shipment, original-volume fulfillment and later customer results
Local speed mistaken for portfolio value	Compare the complete feasible plans under common resources, customer rights and cost boundaries
Optimization mistaken for a forecast	Publish the finite action set and sensitivity; unknown field duration and reliability remain unknown
Technical authority collapsed into the PM	Keep specialist sign-offs and delegated commercial decisions with their actual owners
Design mistaken for client history	Label the scenario, calculations and proposed responsibilities; no appointment or realized benefit is asserted

Review basis. A separate internal reconstruction checks the numerical model and economic extension. A methods agent verifies the primary-source applications and inference boundaries. The author reviews the operating narrative and assembly; the coordinating author inspects the final rendered pages. These agent-assisted roles are distinct from external peer review, a customer acceptance or professional certification. Their records preserve the input, code, payload and release versions.

Partner judgment. The COO should require one explicit commitment packet: original commercial scope, exact shipping configuration, resource-feasible plan, release authority, full cost and recovery rights. The supply-chain lead returns a feasible choice and its consequences, rather than guaranteeing a campaign date from a collection of locally green milestones. The strongest simpler alternative remains part of that decision.

Disposition. The case supports a concrete planning and delivery conversation. It does not authorize a real product release or establish a historical transformation result. Replace the synthetic inputs, validate the technical and commercial prerequisites, and set the prospective observation plan before acting. Final publication remains conditional on independent calculation, source/claim, confidentiality and all-page visual review records.

Internal review with documented limits. A matching output hash preserves reviewed bytes; it cannot make an invented assumption true or turn a proposed role into past experience.