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AEROSPACE & DEFENSE

Surge Capacity and the Defense Industrial Base

How Prime Contractors and Tier 1 Suppliers Can Prepare for the U.S. Missile Replenishment Surge and the Manufacturing Partner That Was Built for It

7

U.S. Manufacturing Facilities

Coast-to-coast domestic footprint

25+

Manufacturing Technologies

Under one consolidated partner

White Glove CPMO

Customer Program Management Office

Single point of accountability

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Executive Summary

The United States is on the verge of the largest peacetime missile production ramp in a generation. Depleted stockpiles, peer-competitor threat calculus, and the strategic lessons of recent conflicts have converged into a single imperative: the defense industrial base must be able to manufacture precision munitions at scale—fast.

For prime contractors and their Tier 1 suppliers, that imperative lands squarely on a question they may not have fully stress-tested yet: **Is our manufacturing supply chain actually built for surge?**

This eBook examines what missile replenishment surge really demands from the manufacturing layer. And why the conventional approach of spreading production across a fragmented supplier network creates structural risk precisely when schedule pressure is highest.

It also introduces a different model: A consolidated, multi-location U.S. manufacturing partner with the process breadth, certifications and program management infrastructure to absorb surge requirements without requiring primes to build new supply relationships from scratch.

That partner is Fathom.

> **“The question is no longer whether the U.S. will surge missile production. The question is whether the defense industrial base is structurally ready to execute.”**

Section 1 The Missile Replenishment Imperative: What the DoD Actually Needs

The strategic calculus has shifted. Missile stockpiles that were sized for one set of threat assumptions now need to be rebuilt—and rebuilt quickly—against a deterrence environment defined by peer and near-peer adversaries operating at scale.

The DoD's urgency is not hypothetical. It is written into budget requests, into Congressional direction and into the operational requirements coming out of theater commands. Programs like GMLRS, JASSM, LRASM, AIM-120, SM-6 and Tomahawk are all facing production rate increases. The Replicator Initiative adds an unmanned dimension. The bottom line is the same across all of them: The industrial base needs to produce more, faster, while maintaining the quality and traceability standards that classified munitions programs demand.

Three Forces Driving the Surge

Stockpile Depletion:

The transfer of precision munitions to allied forces in recent conflicts has consumed inventories that take years to replace under normal production rates.

Peer Competitor Parity:

Maintaining credible deterrence against adversaries with large, modern arsenals requires the U.S. to demonstrate sustained production capacity, not just inventory on hand.

Congressional Mandates and Multi-Year Procurement:

Congress has directed multi-year procurement authorities specifically to give the industrial base the demand signal it needs to invest in capacity. The contracts are coming. The question is who can fulfill them.

What 'Surge' Actually Requires of Manufacturers

When a prime contractor receives a high-rate production contract—or transitions from LRIP to FRP on an accelerated timeline—the requirement that flows down to suppliers is not simply "more parts." It is more parts, faster, at the same quality level, with the same documentation and traceability, from a facility that is already certified and already understands the program.

That is a fundamentally different ask than the typical new-business conversation. It is a stress test of existing relationships, existing systems and existing capacity. Suppliers that were adequate at low rate often break at full rate. Quality systems that were sufficient for prototype quantities do not always scale. Workforce capacity that worked for one program cannot always absorb two.

And the supply chain math compounds quickly. A modern tactical missile involves six to ten major subsystems. Each subsystem requires multiple manufacturing processes: precision machining, sheet metal fabrication, additive manufacturing for complex geometries, advanced surface treatments and non-destructive inspection. When each process is sourced from a separate supplier, a prime managing a surge program can easily find itself coordinating 15 to 25 vendor relationships, each with its own schedule, its own quality system, its own point of contact.

> **“A fragmented supply chain is a schedule risk. In a surge environment, it becomes a program risk.”**

Section 2 The Fragmented Supply Chain Problem— and Why It Gets Worse Under Surge

The defense manufacturing supply chain was not designed for surge. It was designed for stable, predictable, low-to-moderate rate production. Suppliers were qualified one at a time, for specific processes, on specific programs. The system is optimized for compliance and risk management at steady state, not for the kind of rapid scaling the current moment demands.

The Coordination Tax

Every supplier relationship in a program's supply chain carries what we call a coordination tax: the ongoing cost, in time and management bandwidth, of maintaining that relationship. Purchase orders, delivery tracking, incoming inspection, quality audits, nonconformance resolution, drawing changes, engineering change orders—every one of these activities multiplies with every supplier you add.

At low production rates, the coordination tax is manageable. At surge rates, it becomes the dominant constraint on program execution. Program managers spend more time chasing parts and resolving supplier issues than managing the program itself. Engineering teams that should be focused on product improvement are instead managing ECO communication across a fragmented supply base.

The Single-Point-of-Failure Problem

A supply chain built from 20 separate suppliers has 20 potential single points of failure. Any one of them—a machine down, a key employee out, a quality escape at incoming inspection, a capacity conflict with another program—can hold a missile component hostage and put a delivery at risk.

This is not a theoretical risk. It is the lived reality of every program manager who has watched a fully assembled missile sit waiting for one missing bracket from a supplier three time zones away.

The Qualification Bottleneck

Standing up a new supplier under surge conditions is not a solution—it is a 12-to-18-month problem. ITAR registration, AS9100D certification, CPSR audit readiness, first-article inspection, process qualification—the qualification pipeline for a new defense supplier is deliberately rigorous and deliberately slow. That is appropriate. It is also incompatible with the kind of rapid capacity expansion that surge programs demand.

The implication is direct: When a surge contract lands, a prime cannot add new suppliers fast enough to absorb the workload. It has to make do with the supplier relationships it already has or consolidate with partners who already have the capabilities, certifications and program familiarity to absorb additional scope immediately.

“In a surge environment, you don’t have time to qualify new suppliers. You need partners who are already qualified, already certified, and already capable.”

Section 3 What a Purpose-Built Surge Partner Looks Like

Not all contract manufacturers are created equal. And in a surge environment, the differences between a transactional supplier and a true manufacturing partner become the difference between a program that executes and one that misses its milestones.

A purpose-built surge partner has three structural characteristics that set it apart. It has the geographic footprint to absorb and distribute production load across multiple domestic facilities. It has the process breadth to handle a missile component's full manufacturing journey without handoffs to outside suppliers. And it has a program management infrastructure that treats the prime's schedule as its own.

Characteristic 1

A Multi-Location U.S. Manufacturing Network

Geographic distribution is not just a supply chain resilience feature. It is a surge capacity multiplier. A manufacturing partner operating 7 facilities across the continental United States can absorb a significant production increase across its network with far less disruption than a single-facility operation attempting to double its floor space and headcount overnight.

For DoD programs, domestic production is not optional. ITAR requirements and domestic content mandates in defense contracts make offshore or partially offshore supply chains non-starters. A partner with a true all-domestic manufacturing footprint eliminates that compliance risk entirely and gives the prime a single ITAR-registered entity to manage across the entire engagement.

Fathom operates 7 manufacturing facilities across the United States. The network includes facilities with AS9100D certification and ITAR registration and is designed for the kind of coordinated multi-site production that complex missile component programs require.

Characteristic 2

Breadth of Manufacturing Technologies

A missile component's journey from raw material to final assembly-ready part may touch a dozen distinct manufacturing processes. Precision CNC machining for structural housings. Sheet metal fabrication for airframe components. Wire EDM for complex geometries. Additive manufacturing for internal structures and conformal features. Injection molding and urethane casting for non-structural elements. Hard anodize and specialty coatings for corrosion and environmental protection. Non-destructive inspection and CMM measurement for every critical feature.

When a different supplier owns each process, every handoff is a potential schedule risk. Parts travel between facilities. Quality documentation must follow them. Non-conformances get lost in the translation between quality systems. And when something goes wrong—as something always does on a complex program—the question of who owns the resolution becomes a finger-pointing exercise.

Fathom's technology portfolio spans the full range of processes that precision defense components require: 5-axis CNC machining, multi-axis turning, sheet metal fabrication and forming, wire and sinker EDM, SLS, MJF, FDM and DMLS additive manufacturing, urethane and injection molding, plus a full spectrum of surface treatment and finishing capabilities. For most missile component families, Fathom can manage the entire manufacturing sequence under one program, from first cut to final inspection with one purchase order and one quality record.

Characteristic 3

White-Glove Program Management

Technical capability matters. But in a surge environment, program management is often the differentiating variable. The prime needs to know where its parts are. It needs a single phone number to call when there is a schedule question. It needs engineering change orders to propagate instantly across every process in the build sequence, not trickle through a phone tree of individual supplier contacts.

Fathom's Corporate Program Management Office (CPMO) model was designed specifically for programs where complexity and schedule pressure are high. Every Fathom engagement at the defense tier is assigned a dedicated program manager who serves as the single point of contact for the prime's procurement, engineering and program management teams.

That program manager owns the schedule. They own the quality record. They own the ECO process. They own the delivery communication. And they are empowered to coordinate across Fathom's entire network to solve problems before they become schedule impacts.

For a prime program manager running a surge contract, this model eliminates the coordination tax entirely. Instead of managing 15 supplier relationships, they manage one. Instead of reconciling 15 separate delivery schedules, they get one integrated view. Instead of chasing 15 points of contact when a delivery slips, they make one call.

> **“One purchase order. One quality record. One program manager. One source of accountability for every process in the build sequence.”**

Section 4 Fathom's Missile Surge Capability: By the Numbers

The argument for a consolidated manufacturing partner only holds if that partner can actually demonstrate the capabilities it claims. Here is where Fathom's infrastructure makes the case concretely.

7
U.S. Manufacturing Facilities

Fathom's domestic network spans 7 facilities across the continental U.S., providing geographic distribution, capacity redundancy and the multi-site coordination that complex defense programs require. The network includes facilities with AS9100D certification and ITAR registration.

25+
Manufacturing Technologies

CNC machining, sheet metal fabrication, EDM, additive manufacturing (SLS, DMLS, FDM), injection molding, urethane casting, and the full spectrum of precision surface treatments and finishing processes. Most missile component families can be completed without leaving the Fathom network.

1
Dedicated Program Manager (CPMO)

Every Fathom defense engagement is supported by a dedicated Program Management Office contact who owns schedule, quality and delivery communication across the entire engagement, regardless of how many facilities or processes are involved.

100%
U.S.-Based Production

No offshore sub-tier suppliers. No international data flows. Full DFARS and domestic content compliance across every facility and every process. Fathom's all-domestic footprint eliminates a category of compliance risk that fragmented supply chains routinely create.

Section 5 How Fathom Supports a Missile Program in Practice

What does engagement with Fathom actually look like on a surge program?

The following illustrates how Fathom's model operates across the lifecycle of a defense component, from initial qualification through high-rate delivery.

Phase 1: Program Onboarding and Qualification

The engagement begins with a structured program kickoff. Not a generic new-supplier process, but a purpose-built defense program intake that maps the component family, reviews drawings and specifications against Fathom's process capabilities and identifies the optimal facility assignments within the network.

Because Fathom's network includes facilities that are already ITAR registered and AS9100D certified, the compliance onboarding that typically consumes months with a new supplier can be dramatically accelerated for qualifying programs. The prime is not starting from scratch. It is engaging with a partner who already has the infrastructure in place.

The CPMO program manager is assigned at this stage and participates in the kickoff. From the first meeting, the prime has a name, a phone number and a direct line into Fathom's production system.

Phase 2: LRIP—Low-Rate Initial Production

LRIP is where the program's manufacturing sequence is proven out and the documentation baseline is established. Fathom's engineering team works with the prime's manufacturing engineering group to optimize process sequences, identify tooling requirements and validate first-article submissions.

Any ECOs or design changes during LRIP are managed through the CPMO's single-point intake process. Rather than the prime issuing the same ECO to 12 different suppliers and tracking 12 separate acknowledgments, the ECO comes to Fathom once. The CPMO distributes it across every affected process and facility, confirms receipt and implementation and provides the prime with a single consolidated confirmation.

Phase 3: FRP—Full-Rate Production and Surge

This is where the structural difference between Fathom's model and a fragmented supply chain becomes operationally visible. When the prime's contract transitions from LRIP to FRP—or when a surge order arrives with compressed delivery requirements—Fathom's response is coordinated across the network, not sequential across a series of individual supplier conversations.

Capacity from underloaded facilities in the network can be reallocated to support the surge. Tooling and fixtures can be duplicated and deployed to secondary facilities. The CPMO provides a single integrated schedule view that shows the prime exactly where every part is in the production sequence, not a patchwork of individually negotiated commitments from separate suppliers.

The result is the kind of schedule visibility and supplier accountability that program managers on high-rate defense contracts rarely experience because most supply chains are not built to provide it.

> **"When the surge order arrives, you need a partner whose first instinct is to solve the problem across their network — not to protect their individual capacity allocation."**

Section 6 Preparing Now: Steps Primes and Tier 1s Should Take Today

The missile replenishment surge is not a future event to be planned for eventually. Contracts are being awarded now. Production rate requirements are being defined now. The supply chain decisions that primes and Tier 1s make in the next 12 to 18 months will determine whether they can execute their commitments—or whether they find themselves in a deficit position after the contracts land.

Here are three concrete actions that defense-focused supply chain and program management leaders should take now.

Action 1

Audit Your Supply Chain for Surge Readiness

Map your current supplier base for every major component family in your missile programs. For each supplier, assess:

Do they have the certifications required (AS9100D, ITAR, NIST 800-171)?

Can they scale to 2x or 3x current production rates without standing up new qualifications?

Do they have a program management layer capable of handling the ECO and delivery communication volume that FRP generates?

Most supply chains will surface significant gaps in this audit. Identifying them now, before a surge contract lands, gives you time to address them. After the contract lands, you are in triage mode.

Action 2

Consolidate Process Coverage

Look at your supplier count by process type and ask how many of those relationships could be consolidated under a partner with multi-process capability. Every supplier relationship you eliminate is a coordination tax reduction, a schedule risk reduction and a quality traceability simplification.

Consolidation is not about reducing competition. It's about reducing complexity. A partner who can handle CNC, sheet metal, surface treatment and inspection under one program umbrella represents a single point of accountability. The distinction matters when a delivery is at risk.

Action 3

Establish Your Manufacturing Partner Relationships Before You Need Them

The worst time to introduce a new manufacturing partner is after a surge contract has been awarded. Program management trust, quality system familiarity and the institutional knowledge that makes communication efficient take time to build. The prime contractors who will execute most effectively in the surge are the ones who have already done the relationship work.

Engaging Fathom now, on a current program, even at modest volume, creates the foundation for a much more capable surge relationship when the production rate increase arrives. The CPMO structure, the quality system interface, the facility-level familiarity with your drawings and processes are assets that will compound in value over time.

Conclusion Built for the Surge. Ready Now.

The U.S. missile replenishment surge is not a future scenario. It is the current operating environment. The contracts are coming. The production rate requirements are being set. The industrial base is being asked to perform at a level that the steady-state supply chain model was never designed to support.

Fathom was built for exactly this moment.

Seven manufacturing facilities across the continental United States. More than 25 manufacturing technologies under one program umbrella. A white-glove Corporate Program Management Office (CPMO) model that gives every prime a single, accountable partner, regardless of program complexity or production volume.

For prime contractors and Tier 1 suppliers managing missile component programs, the question is not whether to consolidate your manufacturing supply chain. The surge is going to force that consolidation one way or another. The question is whether you drive that consolidation on your terms—strategically, before contracts land—or whether you manage it reactively, under schedule pressure, after they do.

> **“The defense industrial base is being called to surge. Fathom is built to answer that call.”**

Ready to discuss your missile program requirements?

Fathom's aerospace and defense team is available to assess your component families, map our process capabilities to your program requirements, and design a consolidation approach that positions you for the surge.

fathommfg.com/missile-replenishment-surge

AS9100D & ITAR Capabilities | 25+ Technologies | U.S. Manufacturing | 7 Facilities

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