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Systems Engineering, Supplier Management, and Assuring Supplier Resiliency—How Does it All Integrate?

In July 2017, Executive Order 13806 was released entitled “Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States” (Trump). To summarize, this order states the need for a resilient base of resources required to protect the National Security of the United States. These resources include not only the current inventory of DoD weapon and support systems, but also the raw materials, electronic components (both new and replacement), manufacturing capabilities, skilled labor, and not least, money.

In response to the Executive Order, the Secretary of Defense responded with a study outlining the causes for the declining industrial base with a set of recommendations to mitigate it. Several factors leading to the deterioration of the industrial base include: sequestration and uncertainty of government spending; the decline of critical markets and suppliers; unintended consequences of U.S. Government acquisition behavior; aggressive industrial policies of competitor nations; and the loss of vital skills in the domestic workforce (Mattis).

While there is little we can do to alleviate sequestration, government acquisition policy, or Chinese interference, there are areas in which the Engineering and Manufacturing community can provide value and improve US domestic competitiveness. The most cost-effective approach is to architect defense systems that enable competition within the existing defense supply base and enables the expansion of suppliers from adjacent industries. This requires a more open and well-documented system architecture and ensuring that DoD organic assets have comprehensive technical documentation and system know-how. Model-Based Systems Engineering (MBSE) is one of the best tools to embody this technical documentation.

How can we be more cost effective in the defense manufacturing space to mitigate dependency on Chinese or other foreign parts or manufacturing services? One methodology is to use the power of system modeling with an integrated digital thread to manufacturing processes. System modeling enables architectures that enable supplier competition as mentioned above while direct digital links between system design and manufacturing reduces production setup costs. Both a more competitive supply chain and



reduced setup costs enable the implementation of more agile manufacturing processes to lower the production costs of low volume, high part mix defense products.

How do we affordably integrate these digital threads? How can we improve the efficiency and cost of our manufacturing processes? How do we create more competition with domestic sources with improved system architectures? What plans do we have for suppliers that possess seasoned employees who have retired or otherwise left the company? These are just a few of the many questions that should be answered in developing your own Supplier Resiliency and Management Plan.



Works Cited

President Donald Trump, Executive Order 13806, July 2017.

<https://www.whitehouse.gov/presidential-actions/presidential-executive-order-assessing-strengthening-manufacturing-defense-industrial-base-supply-chain-resiliency-united-states/>

Secretary of Defense Jim Mattis, "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States," Sept 2018.

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