

This slide deck is intended to serve as the kick-off/introduction for the Mission Assistance Effort entitled: "Achieve Stable and Economical Production Rates."

Background: A "Rapid Deployment Training (RDT)" effort was initiated to provide a general overview of the five overarching "Thrust Areas" which in-turn encompass 22 specific Better Buying Power Initiatives (BBPi), included on the "Guidance Roadmap (next slide). Of the 22 specific initiatives, 14 have been broken out to comprise an initial set of Mission Assistance Modules that may be presented to Program Management Offices, or other organizations, on an ad-hoc basis.

Many of the initiatives are inherently complementary. In particular, this one, entitled: **"Contributing Factors to Achieving Stable and Economical Production Rates"** is no exception. More specifically, it focuses on production planning with an emphasis on Joint Supply Chain Architecture, Funding stability, Contracting approach (e.g. Multi-year, advance procurement, options, dual sourcing), Operational Requirements, Contractor capacity (e.g. Personnel, tooling, shifts...), Accurate estimating, Requirements stability, Use of process improvement methodologies, such as Continuous Process Improvement, Lean/Six Sigma, and Total Ownership Cost, and Support and sustainment requirements... To name a few!

Recommended Approach: It is anticipated that this module, including these introductory charts, will be used to facilitate and instill critical thinking that will result in the establishment of processes that effectively and efficiently address the various facets of achieving Stable and Economical Production Rates.



## Notional Agenda

**Better Buying Power Initiatives (BBPi)  
Mission Assistance Module:  
"Achieving Stable & Economical Production Rates"**

Minutes	Block Title	Block Description
0-50	"Training Camp"	Introductions and why we're here
50-60		-Break-
60-110	"Game Plan"	Identify factors for consideration
110-120		-Break-
120-210	"OTA" (Organized Team Activity)	Application of tools & Critical Thinking
210-220		-Break-
220-240	"Chalk-Talk"	Recap and plan forward



## Situational Acquisition



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This is the Bill Belichick (New England Patriots Head Coach) video on “situational football”.

Likewise, in Situational Acquisition we will need to use critical thinking skills to analyze our situation and come up with the best combination of tools and approaches based on Programmatic and Industry-specific parameters.



## USD(AT&L) Goals

- **Removing government impediments to leanness**
- **Avoiding program turbulence**
- **Maintaining a vibrant and financially healthy defense industry**
- **Developing our Acquisition Workforce**

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These are the key AT&L desired end-states for this initiative, this Mission Assistance effort is intended to facilitate establishment of tailored objectives to enable your program to meet these goals.

These goals are from the USD(AT&L) 28 Jun 2010 Memo:  
[http://www.acq.osd.mil/docs/USD\(AT&L\)\\_Memo\\_to\\_Acquisition\\_Professionals\\_June\\_28\\_2010.pdf](http://www.acq.osd.mil/docs/USD(AT&L)_Memo_to_Acquisition_Professionals_June_28_2010.pdf)



## Definitions

- **Economic Production Quantity/Rates (EPQ/EPR):** Output rate at which an end-product can be manufactured at the least total cost.
- **Economic Order Quantity (EOQ):** The level of inventory that minimizes total inventory holding costs and ordering costs.
- **Minimum Sustaining Rate (MSR):** The lowest number of units a contractor can economically produce within a correlating specified period of time.

“...communicate effectively about quantity instability impacts... recognize that you will be dependent on industry providing production rate and minimum sustaining rate estimates...” (AT&L Magazine – “Manufacturing Affordability”)

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The language in the USD AT&L memos mentions both Economic(al) Production Rates and Economic Order Quantity. They are not the same thing, but they are related. EOQ may be a factor in determining EPR and the EPR formula is found in the Financial Management Regulation as depicted on the following slides.

Definition (EPR): [www.businessdictionary.com](http://www.businessdictionary.com) (also defined in DoD Financial Manuals)

Regarding EPR: Please note that that technically, the EPR calculation is defined in the DoD Financial Management Regulations specifically referring to one shift, 8 hours per day for 5 days per week, which may in fact not be the most economical lot-size order.

The bottom line is that you, the PM, need to understand how to communicate effectively about quantity instability impacts, to recognize that you will be dependent on industry providing production rate and minimum sustaining rate estimates, and that your ability to assess their accuracy will be limited.

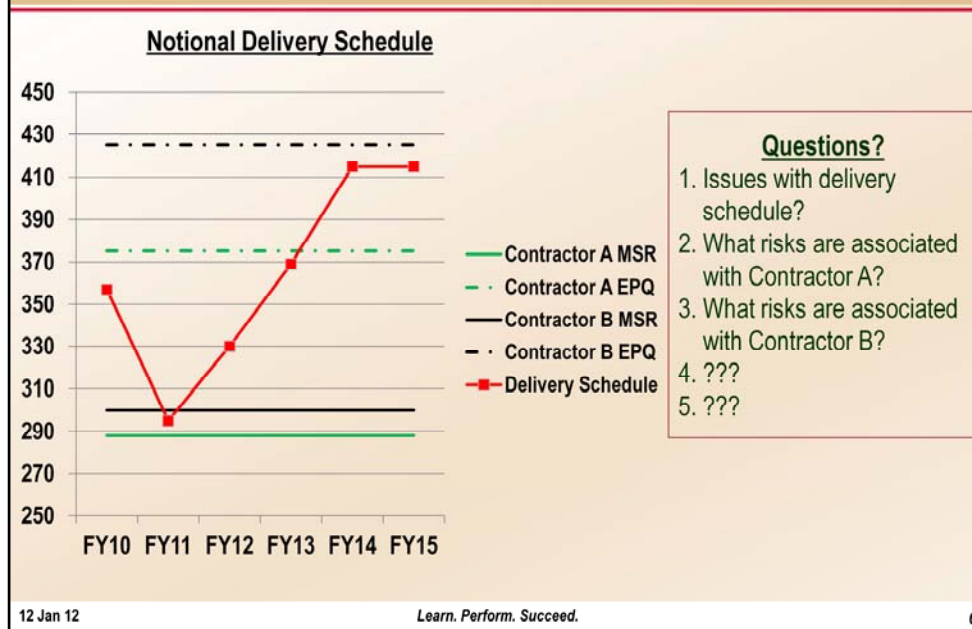
The definition of MSR is associated with the ability to maintain a viable and profitable industrial capability.

Industry cites the following more elaborate definition:

*Minimum Sustaining Rate (MSR) is defined as "the lowest level of utilization necessary to ensure the continued viability and vitality of a given industrial capability. An MSR incorporates elements of both quantity and how production of that quantity is integrated over time within the supply chain. Other elements must also be considered in deriving MSRs to include consideration for the retention of critical skill sets, facility costs, processing technology, supply support/logistics ramifications."*



## Procurement Rate – Weapon Ramps Economic Production Quantity



-Economic Production Quantity (EPQ) as used here is distinguishable from Economic Order Quantity (EOQ) as used in Supply Chain Management.

--Economic Production Quantity/Rates (EPQ/EPR): Maximum **output rate at which an end-product can be manufactured at the least total cost.**

--Economic Order Quantity (EOQ): **The level of inventory that minimizes total inventory holding costs and ordering costs.**

-Minimum Sustaining Rate (MSR) is the lowest number of units a contractor can economically produce within a correlating specified period of time.

-For a specified production period, total production quantity should fall between MSR and EPQ

--Below MSR paying a premium to maintain production capability (e.g. higher share of fixed production costs)

--Above EPQ may require addition of infrastructure that may not be fully utilized.

In this example discuss and answer the questions with the participants and then have them come up with some additional questions or assumptions for possible consideration...

1. Issues with delivery schedule?
  - First delivery exceeds 2<sup>nd</sup> and 3<sup>rd</sup> (i.e. no apparent ramp-up).
  - FY11 delivery falls below Contractor B MSR.
  - FY 14 and 15 delivery falls above Contractor A EPQ (production schedule does not appear to take into account production capacity).
2. What risks are associated with Contractor A? In FY 14 & 15 Contractor A may need to expand capacity to meet delivery schedules (Gov't may incur a premium for additional effort or sourcing).
3. What risks are associated with Contractor B? In FY11 Contractor B may not be able to sustain production without the Gov't (or other customers) incurring a premium (unless contractor B can manage to a reduced MSR)

In this example we are assuming constant EPQ and MSR; in reality these may change as processes, infrastructure, and business strategies evolve.

What factors might have contributed to the formulation of this delivery schedule? There may have been an anticipation of training, which in turn led to the poor ramp.

How can a contractor adjust their EPQ or MSR?

What variables identified in the previous block (refer to butcher paper or whiteboard) may impact the Gov't's calculation of their EOQ?



## Economical Production Quantity/Rates Contributing Factors

- Focus on production planning with an emphasis on Joint Supply Chain Architecture
- Funding stability
- Contracting approach (e.g. Multi-year, advance procurement, options, dual sourcing)
- Operational Requirements
- Contractor capacity (e.g. Personnel, tooling, shifts...)
- Accurate estimating
- Requirements stability
- Use of process improvement methodologies, such as Continuous Process Improvement, Lean/Six Sigma, and Total Ownership Cost
- Support and sustainment requirements

Specific reference: DFARS 217.174 and other Multi-year sections: Excerpt - (vii) The proposed multiyear contract provides for production at not less than minimum economic rates, given the existing tooling and facilities. The head of the agency shall submit to USD(C)(P/B) information supporting the agency's determination that this requirement has been met (10 U.S.C. 2306b(i)(1)(G)).]



## EPQ/EOQ Success in DoD

- Navy's E-2D Advanced Hawkeye program
- Air Force Small Diameter Bomb (SDB) II

EOQs were directed and are expected to realize savings of \$575 million for the E-2D and \$450 million for the SDB II as a result.

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These are two examples specifically cited by AT&L in the implementing policy memorandums.

During reviews for initial production for both programs, business case analyses demonstrated significant dollar savings and more rapid achievement of operational capability, with the use of aggressive but attainable production profiles. Those EOQs were directed and are expected to realize savings of \$575 million for the E-2D and \$450 million for the SDB II as a result.

More specifically:

Advanced Hawkeye E-2D Program: will provide tangible, identifiable outputs through better understanding of the cost of production with increased risk/opportunity management. Cost reduction initiatives include reduced Aircraft Build Touch Labor with reductions in fuselage and final assembly hours, minimizing learning curve adjustments and improve quality of workmanship through training as well as production work flow efficiencies. Additionally, benefits to be harvested through investments made in reducing cost include production tooling for the Rotodome, tooling to support in load of the empennage and factory floor process improvements for the aircraft build. A total investment (not limited to those listed) of \$11,548,608 will capture savings of \$118,774,492 across the entire aircraft buy. (Brian Willouby)





## Better Buying Power Initiatives are Complementary

### Stable Economical Production Rates & Should Cost

**Ohio Replacement Program:** At MS A in December 2010, USD(AT&L) established affordability targets for the program that included the average unit end cost (of subs 2-12) target of \$4.9B and an average annual Operations and Sustainment cost target of \$110M. To achieve this "should cost" objective, key efforts include: 1) reducing OHIO Replacement unique design features so that there is an increased use of VIRGINIA-Class and SEAWOLF-Class components and 2) an innovative acquisition strategy that will utilize multi-year procurement contracts, reduced change orders, and early delivery of key foundation documents like ship specifications by incentivizing affordability and sustainability targets.

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Likewise, this example of a successful "Should Cost" effort shows the interrelationship between the BBPi Mission Assistance modules.

In this particular case, it is evident that stable economic order and production quantities are necessary in order to develop an accurate should cost. More specifically, in this case use of the Multi-year allows the Government and Contractor to negotiate delivery and production schedules tailored to the available production capacity.



## **An Industry Perspective**

Extracted from a presentation by:  
Michael S. Wilson  
President, General Dynamics – OTS  
February 20, 2008

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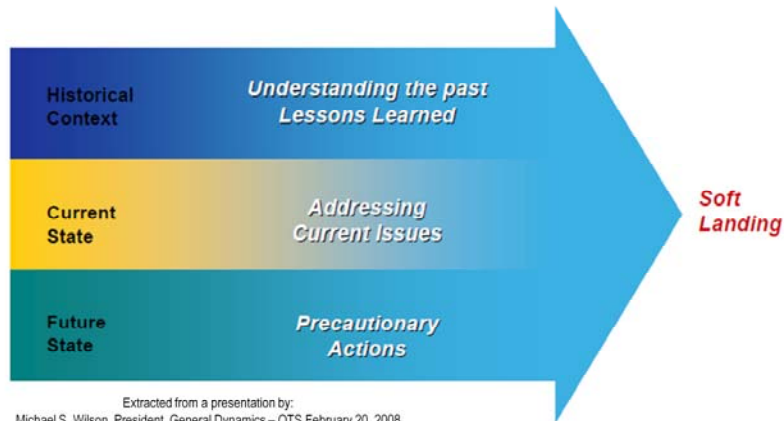
[No notes were included with these stand-alone slides from industry; that said, we should keep in mind, from a Gov't perspective, that all things desired by industry are not necessarily desires of the Gov't.]



## Avoid a “Crash Landing”

### Complex Dimensions of a “Soft Landing”

*A drawdown is inevitable in a post-conflict environment . . .  
 . . . special precautions and proactive planning are essential*



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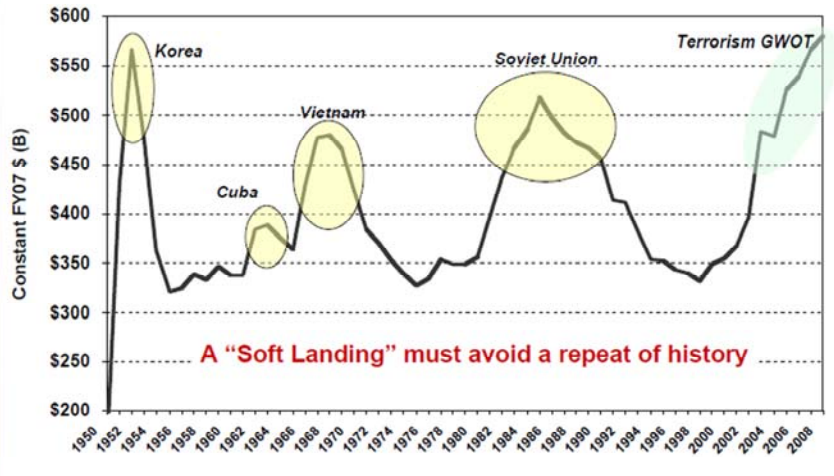
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## Surge is a Fact-of-Life...Plan for it!

### Industry Perspective – The Past



Extracted from a presentation by: Michael S. Wilson, President, General Dynamics – OTS February 20, 2008

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## Focus on End-State

*What should industry be doing to ensure the desired end state?*

- Incorporate LEAN / Six-Sigma into operational culture
- Pursue right-sizing and flexible manufacturing operations
- Improve supply chain oversight and awareness of risks
  - Serve as effective stewards of the supply chain
- Product / Process Innovations: quality, reliability, safety, affordability
- Enable technology growth: re-invest (IRAD) into PEO strategies
- Meet delivery schedules with quality product
- Be a good partner – deliver on promises

Extracted from a presentation by:  
Michael S. Wilson, President, General Dynamics – OTS February 20, 2008

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## Focus on End-State

### *What can the USG do to ensure the desired end state?*

- Balanced risk sharing: Risk - Reward
- Participate in "our" commodity dilemma
- Long-term contracts that encourage investment / modernization
- Communications: requirements, roadmaps, data access
- Synchronize acquisition and IB strategies
- Resource the modernization goals (GOCO and Commercial)
- Allow industry to be partners

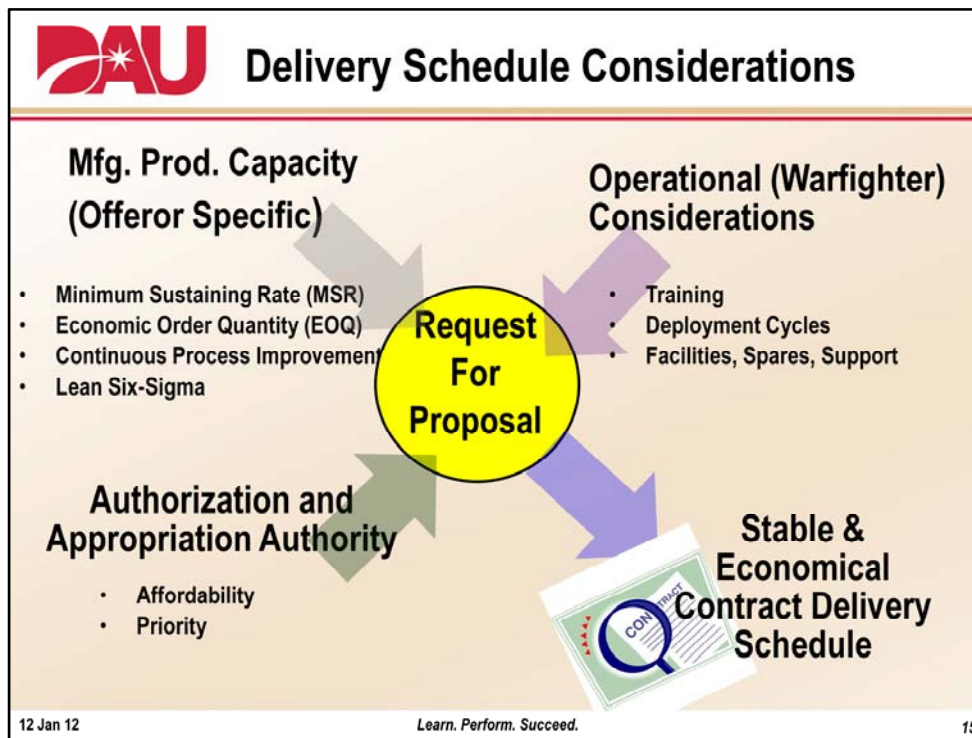
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This chart is intended to stimulate the target audience to think about and address the three major areas of consideration that will help them align their desired production rates, based on warfighter needs and political realities, with the ultimate capabilities of the contractor.

- What do we need to address?
- What information is needed?
- When should it be addressed (upfront planning)?
- How can the program office address the variables at play?

Responses may include, but are not limited to (Capture actual response on butcher paper, whiteboard, or the like, for later use in block 3):

- CONOPS
- Deployment plan
- User flexibility (Training cycles, depot, fleet rotations, etc)?
- Offerors'/Contractor's capacity and flexibility (DD Form 2737)?
- What's the available funding and what is authorized?