



# Working Towards a Unified Systems Engineering Plan

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# Purpose



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Present findings of SE Working Group discussion between ODUSD (A&T/SSE) and Boeing on Acquirer - Supplier technical planning



# Background



## Mission:

*“Define the environment within which SEP/SEMP unification can be enabled, agreed upon, and executed. These documents, which may be initially separate, will be unified into a single document by the time of IBR but still link to related, subordinate documents that are likely specific to the Acquirer and Supplier.”*



# Progression of Discussions



## SEP – SEMP alignment

- Similarities and differences between Acquirer & Supplier SE Plans
- Intent of both
- Gaps and misalignments between the two
- Influences of existing policy & guidance, incl. DID 81024 Systems Engineering Management Plan

## Migration from alignment of “SEP / SEMP” to unification

- Pros and cons of Acquirer / Supplier unification: from Pre-RFP to Post-contract award
- Unified SE planning phasing

## Methodology towards a unified approach

Acquirer: DoD

Supplier: Prime Contractor and its Suppliers



# DoD SEP Prep Guide & Sample Supplier SEMP



## SEP Prep. Guide 2nd Edition V1.0

## Supplier SEMP

1.0 Introduction

2.0 Program Reqmts

3.0 Technical Staffing & Org. Planning

4.0 Technical Baseline Management

5.0 Technical Review Planning

6.0 Integration with Overall Management of the Program

1.0 Introduction

2.0 Applicable & Reference Documents

3.0 Program Overview

4.0 SE Organization Integration & Tech Authority

5.0 SE Technical Processes

6.0 SE Mgt. Processes

7.0 Integ. With Prog. Mgt. Efforts

8.0 Transitioning Critical Technologies

9.0 Integ. Environment for Sys. Engineering

10.0 Additional SE Activities

11.0 Supporting Plans

12.0 Notes

No Direct Correlation To SEP

**Respective Guides Address Many Common Topics**



# Why Not A Single SE Plan?



## Pros :

- Common vision
- Acquirer/Suppliers with stronger team emphasis
- Shared responsibilities
- Clear understanding of programmatic & technical planning
  - Drives alignment of program support documents (IMP/IMS, SOW, WBS, PEP, TEP, etc.)
- Potential downstream cost avoidance & schedule savings

## Cons:

- Cultural changes (i.e. not accustomed to a unified SE Plan)
- Additional up front planning time
- The challenge of achieving greater communication between Acquirer / Supplier
- Potential contractual ramifications when updating plan
- Lack of detailed implementation / experience on both sides
- Potential increase in contract proposal costs?



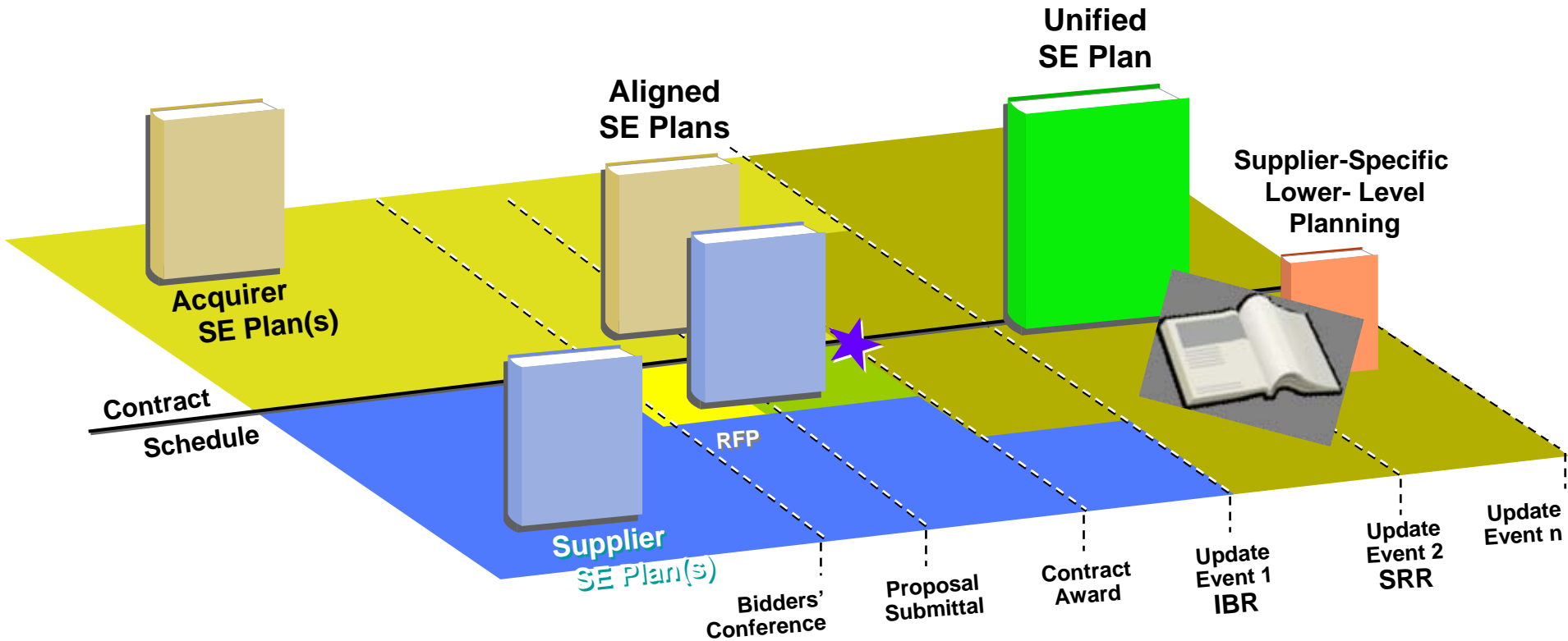
# Vision: SE Plan Unification

- Acquirer/Supplier-developed technical plan for SE implementation
- Acquirer/Supplier shared roles and responsibilities in SE effort
- Acquirer/Supplier conducted event driven technical reviews
- Acquirer/Supplier teaming on linkage with other program plans





# Path to a Unified SE Plan

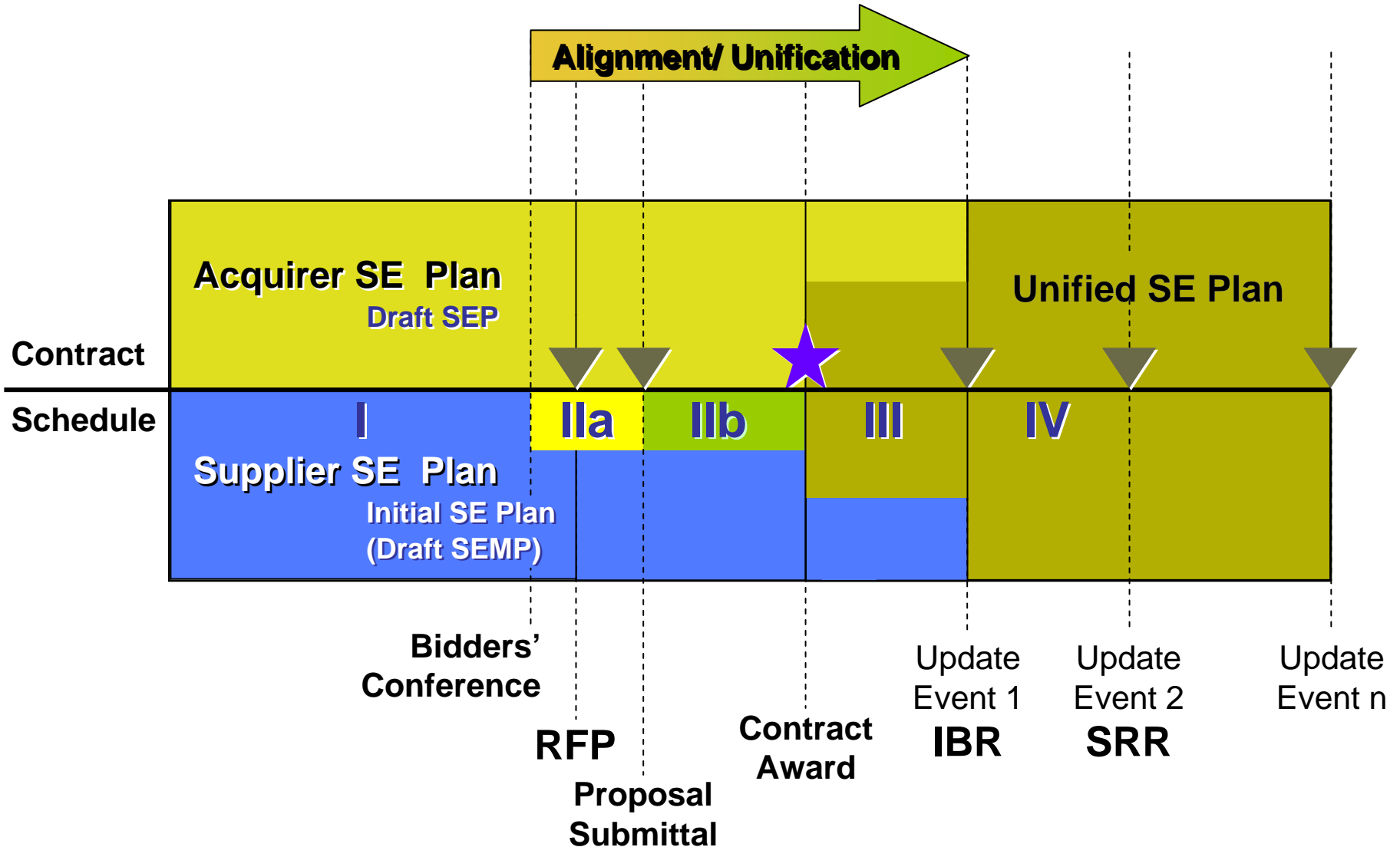






# Unified SE Planning Phasing

Notional Draft for Typical SDD Program





# Phase I



## Leading Up to Bidders' Conference

### Situation:

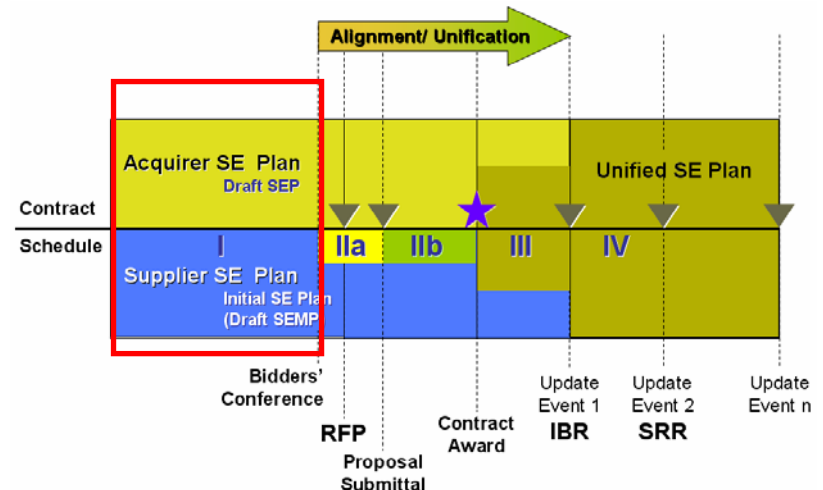
Acquirer requirements emerging for upcoming acquisition

Supplier technical solutions or solution components evolving (potentially independently developed)

### Activities:

Acquirer developing draft SEP for Bidders' Conference (for prospective Supplier(s) feedback)

Prospective Supplier(s) developing draft SEMP for emerging proposed technical solutions





# Phase IIa



## Post-Bidder's Conference to Proposal Submittal

### Situation:

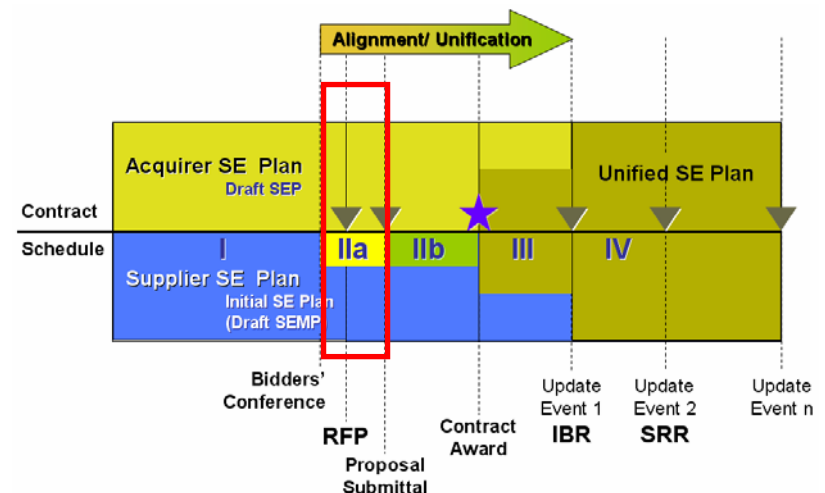
Suppliers have awareness of Acquirer's Draft SEP content

### Activities:

Acquirer making updates to SEP based on Bidder's Conference feedback

Supplier making modifications to Draft SEMP and lower tier plans for alignment to SEP

Initial Supplier identification of integration issues, risks, and opportunities in the proposal





# Phase IIb



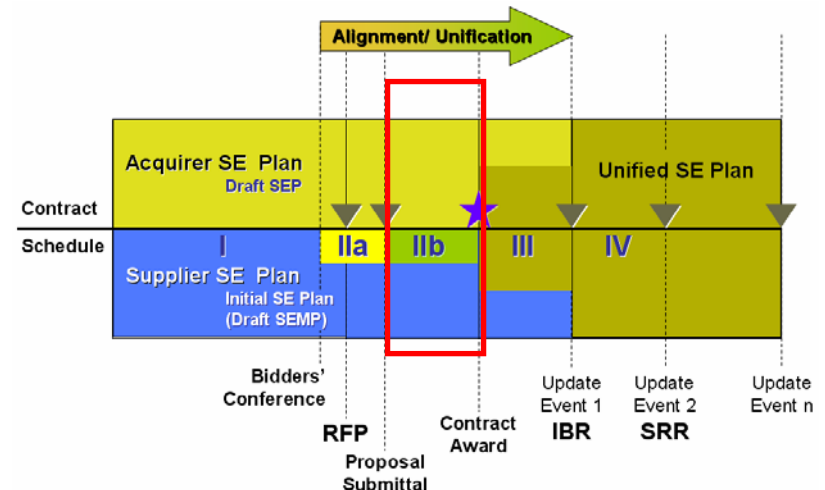
## Post-Proposal Submittal to Contract Award

### Situation:

Acquirer will have received SEMP(s) from the Supplier(s)  
A generally-quiet period from the standpoint of Acquirer-Supplier planning interaction

### Activities:

Acquirer evaluating Suppliers' SEMP(s), associated plan artifacts (IMP/IMS), and quality of the Acquirer planning in the proposal.  
Acquirer makes prospective modifications to SE Plan framework per selected Supplier SEMP  
Supplier(s) performing implementation preparations in anticipation of ATP / Contract Award  
Additional integration issues, risks, and opportunities identified





# Phase III

## Post-Contract Award to IBR



### Situation:

Many opportunities for planning changes

Time for the most significant plan unification to occur, all under the constraints of the contract

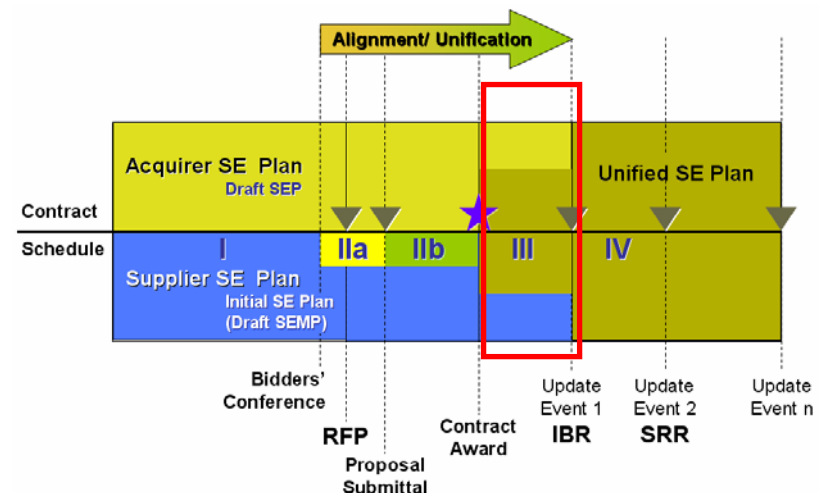
### Activities:

Substantial discussions regarding the push toward a unified SE Plan.

Both Acquirer and Suppliers adjusting planning to better align with contractual commitments

Integration issues resolved and mitigation/realization plans developed

More specific planning details emerging and established





# Phase IV Post-IBR



## Situation:

Unified SEP

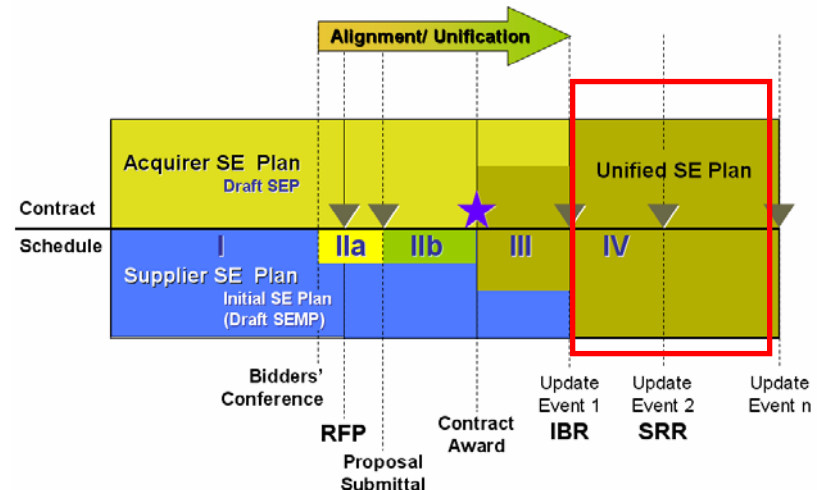
## Activities:

Unified plan being implemented/executed, w/success dependent upon how well the contract was structured.

Results of program execution may vary (w/plan variation) depending on whether the program contract is “Cost Plus” or “Firm-Fixed Price”

Opportunities being identified for next

Unified SE Plan Update Event





# Summary of Phasing



- Unification requires reference to OSD “SEP Prep Guide,” “Integrating SE with DoD Acquisition Contracts Guide,” and relevant industry SEMP Guide
- RFPs will include Acquirer (Govt.) SE Plan
- Unified SE Plan: A single unified technical planning document detailed down to a specified level that integrates (after contract award) the SEP (Govt SE Plan) in the RFP with the SEMP (Industry SE Plan) in their original proposal



# Threats to Plan Unification



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- Languaging/Definitions
  - Organization and Cultures
  - Proprietary Limitations
  - Contractual Constraints
  - Working Relationships of Participants





# Way Ahead



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Share findings with Government & Industry Forums -- solicit feedback

- SE Forum
- NDIA SE Conference, Oct 07
- Other

Coordinate unified SE plan implementation details with contracting

Propose DoD policy to implement unified SE Plan

Review various guides for revisions as appropriate pending policy decision

Update DID 81024 - Systems Engineering Management Plan



# Questions?



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- What Show Stoppers to this Concept?
  - What Would be the Update Frequency, Criteria, and Approval Authority for this Concept?
  - How Might This Process be Prototyped?
  - What Front-End Guidance Would You Give to the Acquirer (e.g., DoD) for Deploying this Concept?



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# Backup/Reference Material



# Working Group Approach

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Coordination between SE planning representatives of Govt. & Boeing

Establish vision and scope (topics) of discussion/ engagement

Share experiences, best practices, & lessons learned

Identify implementation/ improvement opportunities

Jointly share findings & recommendations



# SE Planning Update Event Types

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New Initiative (Start SEMP)

Authorization to Proceed (ATP)

Program Milestone Reviews

Periodic/Scheduled Updates

Coordinated with Other Significant Document Updates

- PEP
- Subordinate Documents (e.g., TEP, RMP, etc.)
- Supplier Plans

Leading/Lagging Indicators Signaling the Need

- Tests (Failures)
- Significant Changes in Program Events/Outcomes
- Audit Results
- Comments from
  - Customers
  - End Users
  - Program Personnel



# Current Findings / Considerations

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Product of SE process is technical baselines and reviews

Emphasis should be on event-driven reviews; e.g., in the SEP or SEMP, how do you know when you are ready for CDR?

Describing your program processes is not equal to drafting your program SEMP or defining your plan

An objective of DoD is to eliminate “Canned SEPs” and “SEPs for Hire”.

A multi-faceted approach is being used by the DoD for implementing SE plans (SEPs) on programs and hopefully changing culture:

- Issuing the SEP Preparation Guide
- Conducting Awareness Training
- Performing Hands-On Follow-Up Activities

Program managers need to be more involved with systems engineering

Recommendations by systems engineering must be taken more seriously.



# SE Planning Environment



- Multiple Participant Bodies
- Multiple Teams
- Multiple Locales
- Multiple Levels of Interest
- Multiple Time Spans

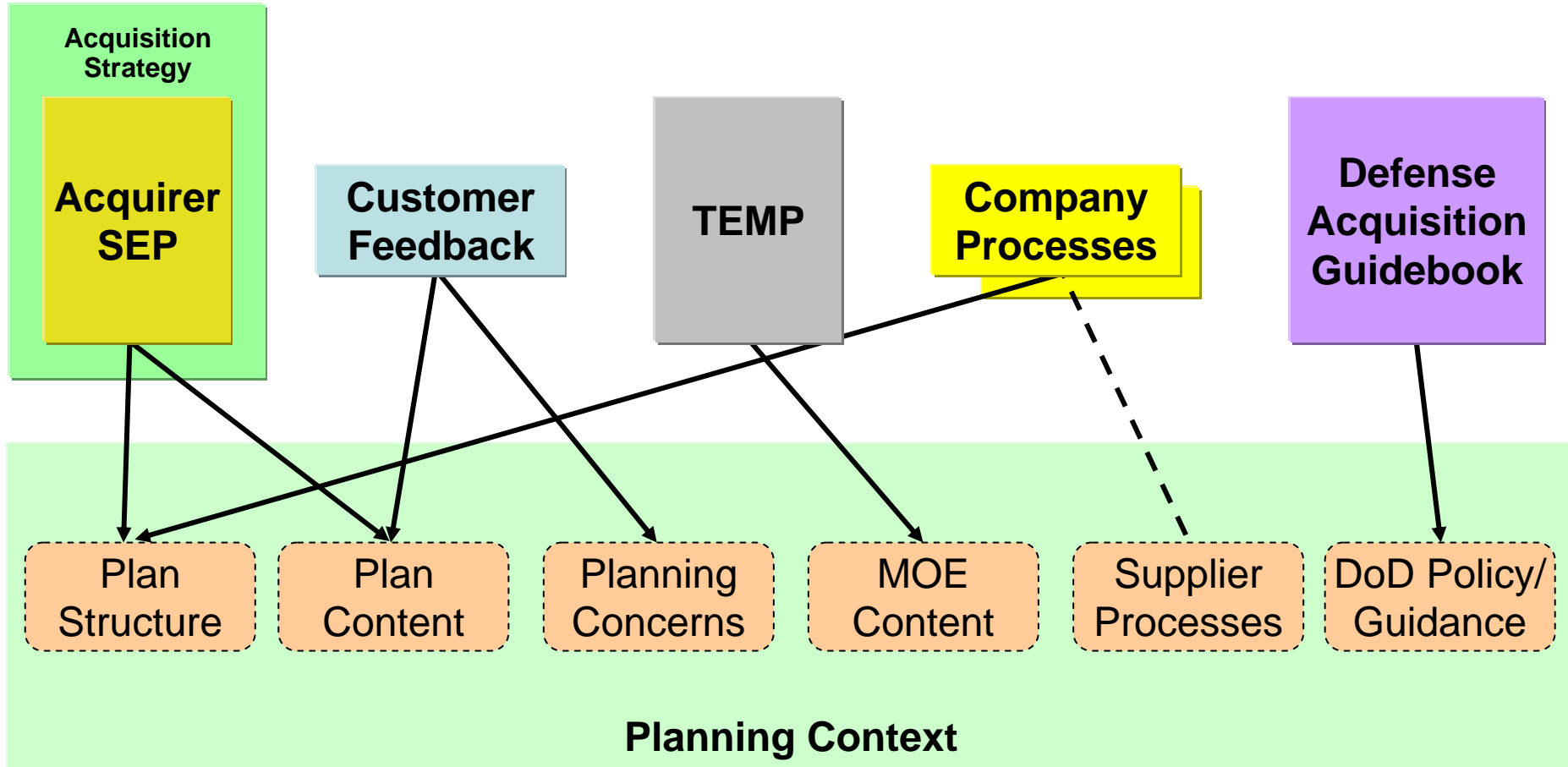




# Aligning & Unifying SE Plans



## Step 1: *Identify* Plan Components







# Aligning & Unifying SE Plans



## Step 2: *Link* Plan Components

