



# *Integrated Master Planning Formulation – PMAG Approach*

*Nancy Droz  
Dr Mun Kwon*

*26/MAR/2010*



# *Agenda*

- Introduction
- Importance of IMP
- Understanding of IMP Build
- Content Based IMP Formulation
- IMP Building Experience
- Integrated Master Planning Formulation– PMAG Approach
- Lessons Learned
- Summary



# *Introduction*

- The IMP and the related cross referenced IMS are critical artifacts of a disciplined Integrated Program Baseline
  - Reflects IPTs and cross IPTs technical content requirements
  - Reflects the technical solution, its implementation, and all work that must be done
- Program Event Driven Planning via the IMP imposes focus on what must be accomplished to declare program success in completing the contract phases of work
  - Program Events (PE)
  - Significant Accomplishments (SA)
  - Accomplishment Criteria (AC)
- On-the-job and Application Oriented IMP Workshop Training Are Crucial for:
  - Team building
  - Understanding of the program structure
  - Successful IMP creation



# *Importance of IMP*

- IMP is crucial to successful execution of Acquisition programs
  - Provides excellent opportunity for greater knowledge and understanding of the program by all SPO personnel involved
  - Ensures an understanding of PE, SA, AC, and associated tasks
  - Ensures all tasks are integrated properly
  - Ensures clear definition of the Program Scope and the Program Structure
  - Promotes teamwork to address and clarify dependencies
  - Ensures flow of knowledge and understanding among IPTs
- IMP is an important management tool
  - Provides basis for IMS developed by contractors
  - Ensures contractor developed IMS provides sufficient insight on program execution status to the government



# *Understanding the Focus of IMP Build Process*

PMAG

- Provide Acquisition professionals with a full understanding of not only What they are doing, but Why they are doing it
- Emphasis on Hands-on IMP Items creation, working with others, and seeing how a program fits together to develop IMP components
  - Hands-on training helps Each Action Officer, Project Manager, Project Engineer, WBS Element Manager, Program manager as An Integrated Team to Understand The IMP Framework
- Understand the Importance Of Developing A Thorough Knowledge Of Key Components Of the Program



# *Understanding the Essential Elements of the IMP Build Process*

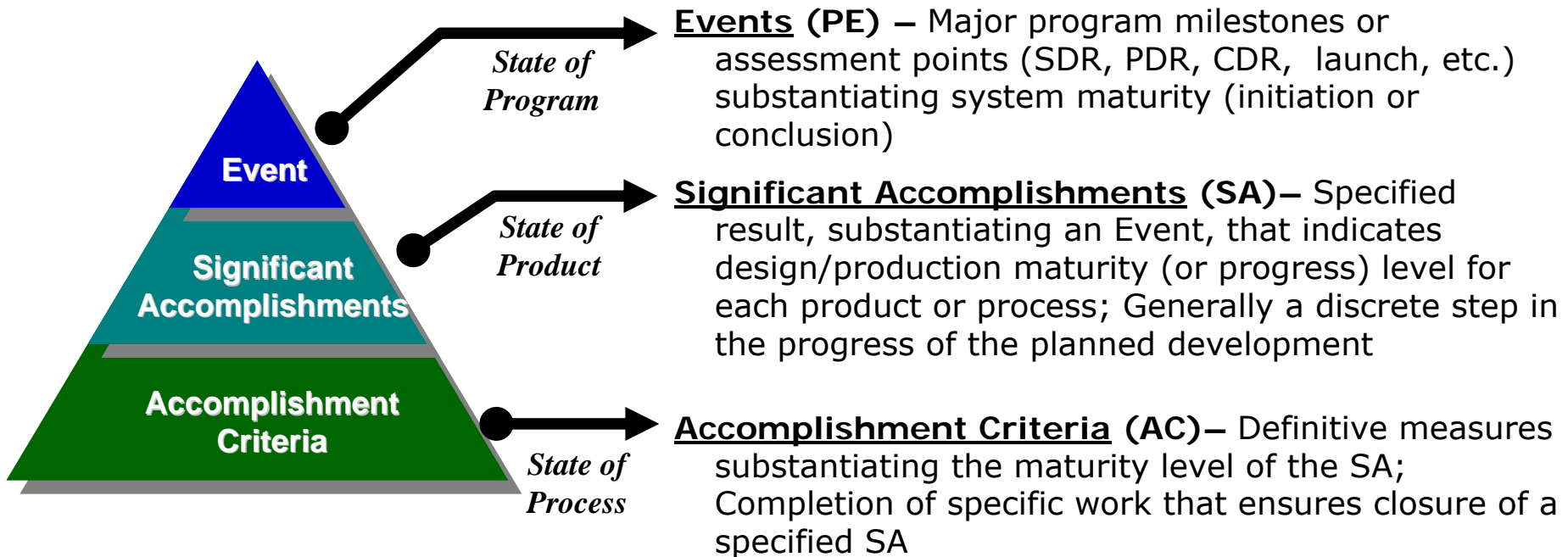


- IMP is a part of the contract and an extension of the SOW
- Understand your terminology (ex. "Conducted" vs. "Completed")
- IMP Level of details
  - Define work required to satisfy completion of each program event
  - Focus on external/internal hand-off points
  - Consistent approach driven process through all sections
- IMP events define how the program progresses toward successful delivery
- SA and AC provide definition of success



# Understanding IMP Hierarchy

- IMP is a hierarchical event-based plan for accomplishing the “measurable” objectives of the program
  - Identifies key PE, SA, and AC





## *What Makes a Good Program Event (PE)?*

PMAG

- Represents the conclusion of an interval of major program activity
- Represents key decision and/or transition points between major activities
- Distribute over the contract period of performance
- Examples of possible program events:
  - Customer requested events
  - Key decisions needed [e.g., down-select of competitive developments; choosing a key implementation, such as ion thrusters vs. liquid propulsion]
  - Risk mitigation event [e.g., completion of a critical payload qualification].
  - Program Milestone events: IBR, SRR, SDR, PDR, CDR, TRR, PCA/FCA, Mission Success Reviews
  - Integrated capability events to demonstrate system maturity





# What Makes a Good Significant Accomplishment (SA)?

- Indicates completion of discrete steps in the development process
- Indicates maturity of the product
- Significant for measuring program event status
- Relevant and logically linked to the right event
- Progress towards completion can be measured discretely
- SAs are NOT merely a listing of "things" coincident with the system event
  - Preferably, they represent a series of staggered accomplishments each of which leads to the event
    - System Event = CDR completed
      - SA # 1 = CDR CDRLs delivered
      - SA # 2 = Critical methods analyses completed
      - SA # 3 = 85% drawings completed
      - SA # 4 = RVTM approved
      - SA # 5 = Development environment operational
      - SA # 6 = CDR meeting conducted
      - SA # 7 = CDR action item work-off plan established



# *What Makes a Good Accomplishment Criteria (AC)?*



- Measurable and provides objective, explicit proof of completion
- Defines conditions for closing the significant accomplishment
- Answers "how do I know when an SA has been completed?"
- A single IPT has accountability for its completion



# *Accomplishment Criteria (AC) to Avoid*

PMAG

- Not significant
  - Too small to significantly contribute to successful event completion
  - Would lead to trivial tasks (e.g., 1 day duration)
- Ambiguous
- Wrong verb or missing verb
  - Using verbs incorrectly
  - Doesn't have a verb at all
- Not measurable
  - Can't tell when we're done
- Too many – more than 10 may indicate:
  - Need for an additional Significant Accomplishment
  - Some may be better identified as IMS Tasks supporting the AC



# IMP Example

**Event "D"**

**Significant Accomplishment "C01"**

**Accomplishment Criteria "C 01 01"**

Hierarchical Numbering  
Format and Outline-style  
indentation

IMP #	Significant Accomplishment Accomplishment Criteria	WBS #	CDRL #
Event D	Cross Program Integration Review - conducted (Detailed technical description of Event D ....)		
SA-D01	FY 2010 Increment 1 Assessment - completed	2	
SA-D0101	FY 2010 SoS Performance allocation Report - submitted	2.2.1.7	B004
SA-D0102	...etc	2.2.1.8	B004
SA-D0103	... etc	2.3.2.2	B004
SA-D0104	... etc	2.4.1.2	B004

"Closure"

**MAY be placed on contract**



# *IMP Building (Case Study)*

PMAG

- When Things Go Wrong
  - Undisciplined collaborative efforts between Government and Contractor
  - Majority of Government representatives and Contractor representatives were not adequately prepared to produce three layers of IMP
  - Provided a Facilitator without Integrated Program Management Content Based Knowledge
  - IMP Group members preparation and inputs were inadequate
  - When a Government group was well prepared and provided significant inputs, but the inputs were ignored by the biased facilitator
  - The Contractor Key SME/Facilitator was not prepared to handle true program content or a realistic IMP Executable Structure

The PMAG experience shows how a program can craft an IMP at the right time, but still face an impractical IMP as a result of applying wrong methodologies and experiencing dysfunctional cultures



# ***Integrated Master Planning Formulation*** ***(PMAG Approach)***

**PMAG**

- **Program Start Up/Transition Assistance to SPO's program team**
  - Planning and IMP formulation for Program Executability
    - Focus Program Reviews in Technical, Cost, Schedule, Management Control, Resource, Systems Integration
  - Training
    - IMP, IBR, EVMS, Integrated Program Risk Formulation, Schedule Assessment and Analysis
  - Hands-on participation in program reviews
    - Identify Integrated Program Risks
- **Joint Collaboration / training including prime and major subs reps**
- **PMAG work products**
  - Application Oriented Training courses
  - Integrated program risks
    - Technical risks
    - Technical Content Based Cost risks
    - Technical Content Based Schedule risks
    - Management Control Processes risks
    - Resource risks
    - Systems Integration Risks
  - PMAG IMP Draft



# *Integrated Master Planning Formulation* (PMAG Approach)

PMAG

- **PMAG value add**
  - Details oriented focus (not just top level)
    - Evaluate technical scope of work at individual control account and work packages level in mind
    - Evaluate technical specifications for 100% completion criteria
    - Evaluate technical specification for work products handoff between IPTs and between prime and major subs
    - Evaluate cost and schedule documents
- **PMAG focus and findings**
  - Insufficient and inadequate technical scope definition
  - Completion criteria are often missing or insufficiently defined
  - Disconnects between customer and prime and major subs on program content of what will be delivered
  - Inadequate technical content description for supplemental detailed IMS or Program Schedule tasks/activities

Programs are often not executable due to inadequate and non-specific definition of technical/cost/schedule scope of work



# *Integrated Master Planning Formulation*

## *(PMAG Workshop Process)*

PMAG

- Creation of IMP Early in the Program's Life
- Develop a deep understanding of the program's scope and requirements
- All project office members are accurately aware of the current status of the program and the direction in which it is headed
- Craft IMP Ground Rules and Assumptions
- Extensively review Program Documents
  - Acquisition Strategy, RFP, Contract, CWBS, Schedule, etc
  - Draft Integrated Program Risks
- The PMAG IMP Planning Team to Draft and Provide a IMP Starting Point to Project Office
  - Draft IMP Contains Initial Set of PEs, SAs, and ACs
- Develop Content Based Application Oriented IMP Training & Workshop





# *Integrated Master Planning Formulation*

## *(PMAG Workshop Process)*

PMAG

- Hands on IMP build assistance to the IPTs and its members in crafting their respective IMP inputs
- Facilitate collaboration and discussions to increase understanding of program dependencies among the IPTs
- Representatives from each IPT gathered at specific times each day to merge the IMP details into a coherent and logical program IMP
- The PMAG team keeps the process moving by simultaneously developing Integrated Program Risks and providing questions for the Program Manager to seek clarification on program structure
  - Convert risks to create appropriate IMP PEs, SAs, ACs to cover the IMP gaps
- Promote Integrated Team Work at all times



# IMP Building Example



## Characteristics

- Provides event based roadmap aligned with product development
- Allows for combined and collaborative Team Structure
- Increases fidelity
- Identifies critical integration items between IPTs



# *Lessons Learned*

## *(PMAG Approach)*

PMAG

- Collaborative discussions fostered mutual respect and enabled the program team to develop a holistic understanding of the program
- Daily, focused, and collaborative team execution is what made the IMP workshop successful
- Use of Application-Oriented training created a real-time, interactive workshop in which understanding could be fostered, materials created, and results evaluated almost instantaneously
- Essential to integrate a diversity of approaches to IMP formulation
  - Different IPTs approaching the program from different perspectives then defend their inputs during the integration of the IMP details
  - IMP integration process consisted of talking through opinions among individuals from different IPTs and choosing different IPT representatives each day for IMP integration



# Lessons Learned

## (PMAG Approach)



- Bottom-up IMP integration process enabled the Program Office to develop a better understanding of dependencies among the IPTs and what the program truly required
- True understanding of a Program Came from actual application-oriented touch time instead of didactic learning
- Inexperienced IMP team members demonstrated that they can learn the essentials of IMP generation through disciplined reading of the materials and guides available
  - Through detailed training by IMP experts on the team and after long, diligent preparation
- Disciplined, focused activity, and Touch-Time enabled program acquisition professionals to truly get involved and understand the program
  - Entire program office benefitted
  - Help project members become one integrated team vs. functional teams
- Project personnel become better educated and more capable as acquisition professionals



# Lessons Learned (PMAG Approach)

PMAG

- Useful IMP should reflect key items from Acquisition Strategy, SOO, SOW, RFP objectives/evaluation criteria to place into the IMP
- Essential to create top-down IMP accomplishments/criteria with management and IPT leads and IPT members
- Essential to keep IMP integrated with all the program baselines
  - Once you have an agreed to set of PEs/SAs/ACs, lock it down and require Program Management approval for any changes
- Do not confuse between Program Office program IMP vs. contract IMP
- Appropriate quantity of SAs and ACs
  - Rule of thumb: 2-10 SAs per Event and 2-10 ACs per SA....but use good judgment
  - Enhance program executability



# Summary

- Event-based planning provides the foundation for managing the execution of the program
- Robust IMP planning enhances government team's understanding of program foundation
- Promote organic IMP formulation capabilities that clearly connects IMS tasks through the IMP/IMS analysis and assessment
- Clearly defined work scope: Everybody understands what is in scope and the implementation strategy
- Clear Traceability: All the product structures align (product, documentation, WBS, OBS, IMP/IMS)
- Requires disciplined and systematic hands-on approach to IMP planning, formulation, and implementation