



AO Cost and Schedule Lessons Learned Workshop

A Proposer's View of Work Breakdown Structure (WBS) and Master Equipment List (MEL)

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Requirements in Recent AOs

| | Mars Scout 2006 | SMEX 2007 |
|--|--|--|
| MEL | Required in Mission Implementation Section | “Highly encouraged” |
| Heritage Appendix | Not required (added in Step 2) | Required |
| WBS | Required in Section on Management and Schedule | “Highly encouraged” Per “NPR 7120.5D up to level 2” |
| WBS Dictionary, WBS Cost Table, Basis of Estimate Details | Not Required, but “All assumptions used in developing cost estimates to help facilitate reviewer understanding the proposed cost estimates must be provided.” and “...proposers should also provide any additional costing information/data which they feel will assist the evaluation team to validate the project’s proposed costs. Vendor quotes, cost estimates, rationale for design heritage cost savings, are all examples of data that can be included here” | “Highly encouraged” |
| Page Limits | MEL and WBS Included in 32 Pages for Mission Implementation, Management and Schedule, and Cost and Cost Estimating Other Topics Included in Appendices with No Page Limit | No page limit |

Comments/Recommendations

- Guiding Philosophy: Step 1 Should Focus on Science, Step 2 on Implementation

 - MEL is Useful to Both Technical and Cost Evaluators and Should be Required
 - Contents Should be Box-Level Breakdown Showing Vendor, Mass (CBE and Contingency), TRL, and Flight Heritage
 - Typical MEL is 1-2 Pages with Current Font Requirements – Consider Moving to an Appendix?
 - Heritage Appendix Should be Deferred Until Step 2

 - WBS is Already Specified by Required Format for Cost Tables
 - WBS Does Not Need to be Included in Proposals

 - WBS Also Must be Consistent with NPR 7120.5D, which has a High Level WBS Dictionary
 - WBS Dictionary Does Not Need to be Included in Proposals
 - Suggest Including NPR 7120.5D WBS and Dictionary in AO

 - Discussion of Cost Estimating Methodology Should Continue to be Required
 - Properly Done, Provides Insight into Basis of Estimate
 - BOE Details Premature in Step 1 and Should Not be Required or “Encouraged” in AO
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Backup – SMEX 2007 AO



- 4.5.2 Management Plans and Structure for Flight Investigations

- “The investigation team should develop a Work Breakdown Structure (WBS) that follows the standard space flight project WBS defined in Appendix G of NPR 7120.5D up to level 2.”

- Appendix B, G. Cost and Cost Estimating Methodology

- “Although not a requirement, the proposers are highly encouraged to provide the following items, which will not be counted against the page limit, to enable the validation of their costs: MEL, WBS, WBS Dictionary, WBS Cost Table, Basis of Estimate Details. A fully developed MEL or WBS is not expected at this stage. However, since a preliminary top-level version of them will probably be used to generate the budget in the proposal, their inclusion in the proposal would be of value to the reviewers in the same way it was to the proposers. The rows in the WBS Cost Table would be the WBS elements whereas the columns would be the real year costs for each fiscal year. As in Tables B3 and B4, the last two columns in the WBS Cost Table would be the Total in real year dollars and the Total in FY 2008 dollars. Basis of estimate details include complete cost model input data, vendor quotes, and comparisons to analogous missions.”

- Appendix B – I. Appendices

- “11. Heritage. Describe heritage for each instrument, each spacecraft subsystem, each ground system, and each major module of flight or ground software. The description should address...[one page of topics]”

- Appendix B – Outline and Page Limits

- “Optional: Master Equipment List (MEL); WBS; WBS Dictionary; WBS Cost Table; and Basis of Estimate Details...No page limit”

Backup – Mars Scout 2006 AO



- 6.6.2. Management Plans and Structure for Flight Investigations
 - “The investigation team must develop a Work Breakdown Structure (WBS) that best fits its organizational approach and mission design concept (see also Appendix B). The WBS must be compatible with the WBS defined in NPR 7120.5C Section J.”
 - Appendix B – G. Mission Implementation
 - “12. A Master Equipment List (MEL) showing all major assemblies and components for every subsystem of each instrument and the spacecraft must be provided.”
 - Appendix B – H. Management and Schedule
 - “A Level-1 and 2 Work Breakdown Structure (WBS) must be provided as a part of the proposal that clearly links the project organization with the cost information to be provided in Table B-1 and provides the proposer with a template for the project schedule information requested above. Inclusion of additional WBS information (Levels 3 and lower) to show spacecraft subsystem and elements of each individual instrument is required to demonstrate clear understanding of the proposer’s implementation plans.”
 - Appendix B – I. Cost, Cost Risk, and Cost Estimating Methodology
 - “All assumptions used in developing cost estimates to help facilitate reviewer understanding the proposed cost estimates must be provided.”
 - Appendix B – J. Appendices
 - “13. Proposal team Cost Data. In addition to the specific cost table data requested in the Cost Proposal, Section J, proposers should also provide any additional costing information/data which they feel will assist the evaluation team to validate the project’s proposed costs. Vendor quotes, cost estimates, rationale for design heritage cost savings, are all examples of data that can be included here.”
 - Appendix B – Outline and Page Limits
 - 32 Pages for Sections G, H, and I Combined. No Page Limit on Appendix J.
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Backup – NPR 7120.5D WBS

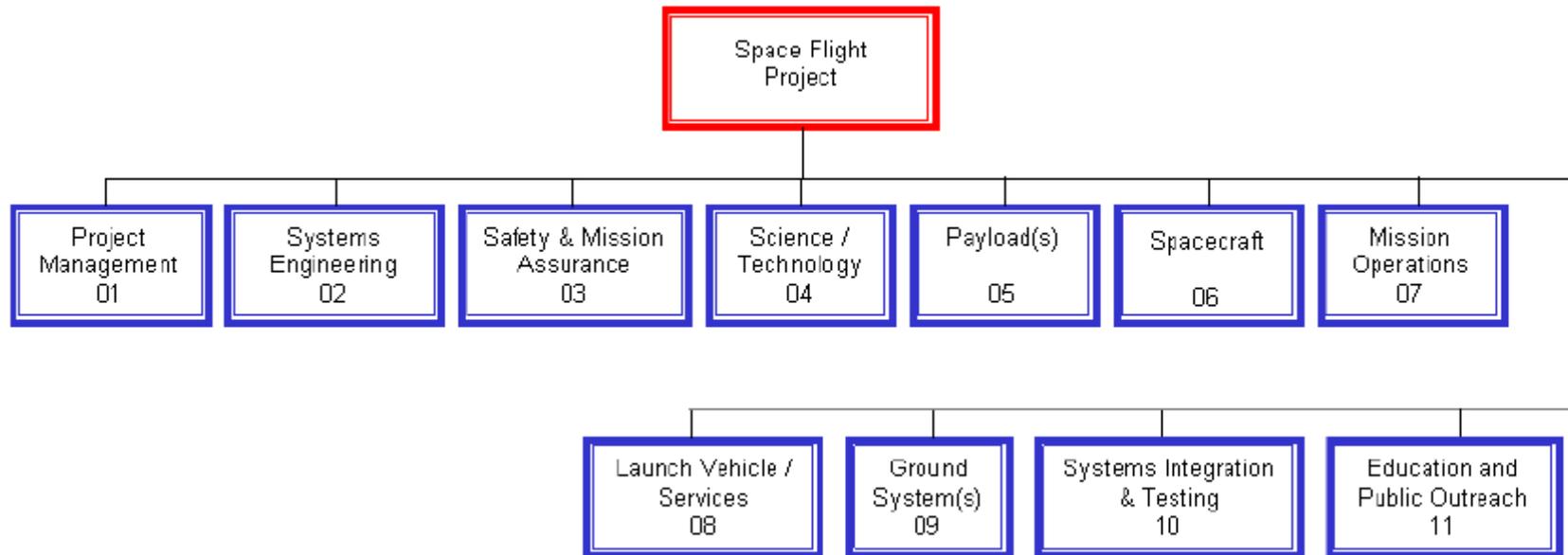


Figure G.4-1 Standard Level 2 WBS Elements for Space Flight Projects