# Case Study

# Task Plan

**Responsible Person:** J. Johnstone (for approval); R.C. Everette (for recommendations and implementation)

**Last Updated:** 7/28/01

**Origination date:** 7/14/01

**Risk Statement**

Risk # 7

> Science requirements have substantial TBDs; late completion of TBDs likely, with reduction in adequate testing time, possible science application software failure, incorrect science data being captured, hardware damage if incorrect safety limits were provided, extensive rework and substantial cost overruns, mission failure if problems not found before system is in operation.

**Classification:** Requirements

**Related risks:** None

**Identified causes**

- inadequate scheduling to allow for requirements definition
- inadequate civil service and contractor personnel resource planning
- all of the science requirements are still not available

**Mitigation goals/success measures/criteria**

The goal of this task plan is to

> Complete the science requirements and submit the change for implementation WITHOUT slipping the overall development completion date. It is preferable to not use overtime or additional resources.

**Chosen Strategies**

The selected strategies to address the key causes and to reach the mitigation goal are

- to analyze, research, and complete the TBD science requirements, and to submit change requests
- to reprioritize the baselined requirements and reorder the builds to minimize impact of TBDs

**Specific actions**

The following work breakdown structure (WBS) describes the actions that will be performed as part of the mitigation plan and identifies who is responsible for completing them. This information will also be reflected in a Gantt chart.

1.0 Reprioritize the baselined requirements and reorganize the builds to implement the high priority requirements first. The likelihood of their changing will be factored into the prioritization process. (J. Johnstone)

- 1.1 Identify requirements with high probability of change. (R. C. Everette)
- 1.2 Identify critical path dependencies among requirements and software modules. (R. C. Everette)
- 1.3 Build a prioritized list of requirements. (R. C. Everette)
- 1.4 Reorganize the contents and schedule of builds to meet the new priorities. (R. C. Everette)
- 1.5 Distribute the changes in build content and schedule to all personnel, and tell the customers that no changes to a specific build will be accepted once implementation of that build has begun (except for corrections to requirements errors that would cause mission failure). (J. Johnstone)

2.0 Estimate the impact to the schedule for builds and requirements based on the projected completion of the TBD requirements. Verify (as much as possible) that the new schedule accounts for the anticipated changes. (R. C. Everette)

3.0 Complete the requirements document for TBD Requirements 38-42 and submit a change request. (John Smith/NASA)

- 3.1 Estimate the intermediate completion milestones.
- 3.2 Report progress weekly.
- 3.3 Complete peer review requirements.
- 3.4 Submit change requests upon the completion of the requirements.

4.0 Complete the requirements document for TBD Requirement 73 and submit a change request. (John Smith/NASA)

- 4.1 Estimate the intermediate completion milestones.
- 4.2 Report progress weekly.
- 4.3 Complete peer review requirements.
- 4.4 Submit a change request upon the completion of the requirements.

5.0 Complete the requirements document for TBD Requirement 104 and submit a change request. (Mary Blue/NASA)

5.1 Estimate the intermediate completion milestones.

5.2 Report progress weekly.

5.3 Complete peer review requirements.

5.4 Submit a change request upon the completion of the requirements.

6.0 Complete the requirements document for TBD Requirements 143-149 and submit a change request. (Joe Kelley/University Intern)

6.1 Estimate the intermediate completion milestones.

6.2 Report progress weekly.

6.3 Complete peer review requirements.

6.4 Submit change requests upon the completion of the requirements.

7.0 Set up a tracking mechanism for change requests and help R. C. Everette determine the magnitude of the problem created by change requests. Weekly reports will be provided to R. C. Everette. The reports will include the impact to the schedule and the resources required to implement each submitted change. (J. Johnstone)

7.1 Design a weekly status report.

7.2 Set up automated metrics collection and reporting.

**Risk tracking indicators**

*TBD requirements completion:*

Indicator: actual completion dates compared to planned completion dates

Trigger: a projected 10% schedule slip in the completion of any requirements document is cause for review

Trigger: a projected 25% schedule slip in the completion of any requirements document will trigger contingency plan A

*Change request magnitude*

Indicator: the cumulative schedule impact due to the changes (based on submitted change requests)

Indicator: the cumulative resource requirements required to implement the changes (based on submitted change requests)

Trigger: If either the cumulative schedule impact indicator or the cumulative resource requirements indicator exceeds their projections by 20%, it will trigger contingency plan B

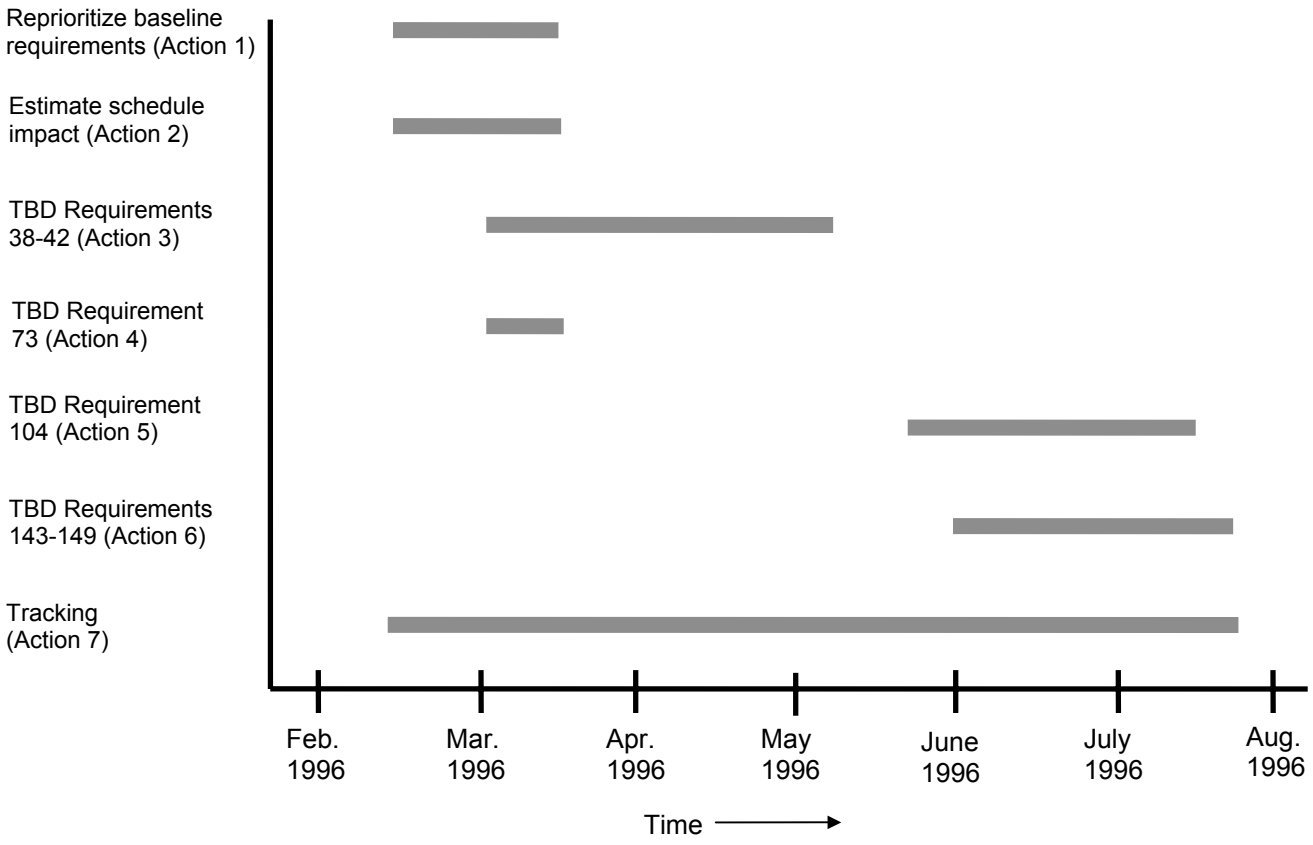
**Budget**

- Planning/oversight:
  J. Johnstone/R. C. Everette: 5 days
- Completing TBD requirements:
  3 civil servants: 14 weeks
  1 university intern: 7 weeks, $10,000
- Reprioritizing:
  R. C. Everette: 7 days
  2 team members: 1 day each to review
- Tracking costs:
  1 civil servant: 3 days to set up automated system;
  R. C. Everette &
  J. Smith: 2 days each to determine tracking measures, triggers, report format, and intermediate triggers. (Cost to produce weekly reports is negligible)
- Totals:
  Civil service time: 18-person weeks
  University Intern cost: $10,000

Expected return: The number of errors is projected to decrease by approximately 75%. The amount of resources assigned to late requirements changes should decrease accordingly by 75%. For this project, the total estimated savings is 50% of the total planned budget. The probability for mission failure due to this risk will be eliminated.

## Schedule (Gantt chart)

| Action | Start Date | End Date |
|---|---|---|
| 1 | February 15, 1996 | March 15, 1996 |
| 2 | February 15, 1996 | March 15, 1996 |
| 3 | March 1, 1996 | May 7, 1996 |
| 4 | March 1, 1996 | March 15, 1996 |
| 5 | May 24, 1996 | July 15, 1996 |
| 6 | June 1, 1996 | July 21, 1996 |
| 7 | February 15, 1996 | July 21, 1996 |



**Contingency strategies, actions, and triggers**

*Contingency Plan A:*

Trigger: A projected 25% schedule slip in the completion of any requirements document

Strategy/actions: Authorize contractor overtime to assist civil service (a maximum of 10 person weeks in contractor time is allowed). Approval by J. Johnstone is required.

*Contingency Plan B:*

Trigger: When either the cumulative schedule impact indicator or the cumulative resource requirements indicator exceeds its projections by 20%

Strategy/actions: Drop the lower-level science requirements to compensate for the estimated development time required to complete the higher-priority requirements.