Green Bank Project Management
What, Why, How, When, Who

Tuesday, 22nd July, 2003
John Ford and Richard Prestage
Agenda

• What is a Project?
• What is Project Management?
• Why do we need to do this?
• How do we intend to do this?
• When do we start?
What is a project?

• A Project is a temporary endeavor undertaken to create a unique product or service.
  – Temporary
  – Unique
Project characteristics

• Endeavors of any size may be a project
  – Large and small projects demand different handling
• Temporary
  – Distinguishes projects from operations
• Unique
  – Not the same old thing
What is not a project?

- Emergency response to operations problems
  - Callouts
  - Repairs and troubleshooting

- Routine operations support
  - Maintenance of equipment
  - Minor modifications and tuning of equipment
What is project management

• The management of projects (Well, Duh!)

• A more academic, if not more useful, definition:
  – The application of knowledge, tools, skill, and techniques to project activities in order to meet project requirements
Project Management responsibilities

• Manage the work involved in a project in terms of:
  – Competing demands for scope, time, cost, risk, and quality
  – Stakeholders with different needs and expectations
  – Identified requirements
Why do we need to do this?

- Budgeting
- Staff allocation
- Schedule development
- Schedule credibility
- Sanity retention

- Reporting what we are doing to the NRAO management as well as the NSF.
How will we do this?

- Project Management Organization
- Project Planning
- Project Communication
Possible Organizations

- Functional Organization
  - Personnel organized by FUNCTION, i.e. electronics, software, operations, etc.
Possible Organizations, continued

- Project Organization
  - Personnel organized by Projects, i.e. Ka Band receiver, Spectrometer, etc.
Possible Organizations, continued

• Matrix Organization
  – Personnel organized in **BOTH** ways
Matrix Management

• Each staff member is a member of 2 distinct organizations
  – Functional – Electronics, SDD, etc.
  – Project – PTCS, Ka Band Receiver, etc.
• Different types of Matrix organizations
  – Strong Matrix
  – Weak Matrix
  – Balanced Matrix
Our Organization

• Our organization leans toward the balanced matrix organization
  – Project Managers typically work directly for a functional manager
  – Project Managers are part time managers
  – Project Managers have limited authority

• BUT: We also have a bit of the strong matrix organization.
  – We have the Project Planning Committee, which serves as the manager of project managers.
  – Project Managers have spending authority and budget responsibility
Execution of Individual Projects

• Each project is executed by a Project Team. For medium and large projects, Project Manager, Project Scientist and Project Engineer roles will be defined (may be combined into one or two individuals).
  – **Project Manager**: The Project Manager *is ultimately responsible for the overall success of the project*. Manages the project budget and staffing allocations, sets the project schedule. Responsible for arranging project reviews, providing status reports, and so on. Represents the project to the GBT Project Planning Committee.
  – **Project Scientist**: Responsible for setting the scientific requirements of the project, and ensuring that they are met.
  – **Project Engineer**: Responsible for the technical aspects of the project.
• Project Scientist and Engineer assist the Project Manager in the execution of the project e.g. preparation for design reviews, and so on.
• Large projects might also define *team leads* for work packages
• Additional scientific and technical staff will be added to the project team as necessary.
• The general level of effort will be agreed by the Project Planning Committee, and then the detailed staffing assignments will be agreed between the Project Manager and the appropriate functional Division Heads.
• We will aim for continuity of effort levels and of specific individuals assigned to a project throughout its life, and specifically through each development cycle.
• These may be reviewed and adjusted on a development-cycle to development cycle basis.
Example Project – PTCS

- Project Manager – Richard Prestage
- Project Engineer – Kim Constantikes
- Project Scientist – Jim Condon (Charlottesville)

- Approximately eight ftes effort spread across all GB and CV scientific services divisions!

- Work packages:
  - Antenna Instrumentation (Team Lead: Kim)
  - Engineering Measurement System (Team Lead: Kim)
  - Astronomical Characterization (Team Lead: Richard)
  - etc
Project Reviews

• Medium and Large projects expected to go through formal design reviews (might have caught some problems on earlier work!)
• Depending upon scope, may require some or all of the following:
  – Conceptual Design Review
  – Preliminary Design Review
  – Critical Design Review
  – Final Lab Review
  – Commissioning Review
• (For more details, see wiki)
Green Bank
Project Planning
Project Planning Overview

- An iterative process
- User’s and Visiting Committee input gathered for strategic direction
- NRAO Program Plan defines projects to be worked on during a year
- The program plan for Green Bank is executed by the Green Bank Staff.

- Simple, eh?
Not Really!
Green Bank Project Planning

• Project Planning Committee oversees the program plan implementation
• Major reviews are held every 6 months
• Mid-term reviews held every quarter
• Work is planned out over 6 week cycles by project managers, with specific development deliverables each cycle.
• Program Planning Committee resolves short-term conflicts over resources on a weekly basis.
Project Planning Committee:


- Meets weekly to resolve short-term conflicts, look ahead to the rest of the 6 week development cycle
- Meets each 6 weeks with all interested personnel in planning the next 6 week development cycle
- Meets quarterly to review progress on 6 month goals, perform mid-course corrections
Project Initiation

• Step 1 – Project Proposal submitted
  – By anyone
  – Submit to a member of the project planning committee
  – Format:
    • 1 page or less written summary.
      – email, fax, napkin, etc. O.K.
    • Should include:
      – scope, strategic value, possible work packages, time frame
  – IDEAS OF ANY SORT CAN BE SUBMITTED WITH ANY AMOUNT OF THE ABOVE DOCUMENTATION, AND WILL BE CONSIDERED
Project Initiation

- Step 2 – Project Charter
- Developed by the originator of the project
- Covers:
  - Why the project is important, including compelling information on items such as timeliness.
  - Scope of the project
  - Preliminary scientific justification
  - Outline of the potential solution
  - Proposed project team
  - Background information that the project team will need to know to execute the project
Project Initiation

• Step 3 – Formal Proposal
• Required for large projects (Months or years of effort)
  – Beyond the scope of this meeting!
Project Initiation

- All of our staff is fully committed right now
- We don’t anticipate starting any new significant projects any time soon
Project communication

- Absolutely critical to the success of our projects!
- Project Meetings
- Planning Meetings
- Weekly Coordination Meetings
- Internet Collaboration Tool: wiki.gb.nrao.edu
- GBT Development Plan
Project meetings

- Project team members
- Short, informational meetings
Weekly coordination meetings

- Attended by the Project Planning Committee
- Approves activities for the next 2 weeks on the GBT resource calendar
- Discusses GBT science, test. and commissioning scheduling
- Discusses other problems of cross-division importance
- Discusses observer comments received during the previous week
6 week cycle planning meetings

• Plan the work to be done on all projects in all disciplines for the next 6 weeks

• Attended by:
  – Project Planning Committee
  – Project Engineers
  – Project Managers
  – Project Scientists
  – Division Heads
  – Any others with an interest
Quarterly reviews

- Review progress against milestones for each project
- Set milestones for next quarter
- Reports on each project submitted by Project Managers prior to the meeting
- Attended by:
  - Project Planning Committee
  - Project Managers
- Outcome of this meeting becomes the contents of the Quarterly Report
Internet Collaboration Tool

- Wiki.gb.nrao.edu
Wiki Description

• The GB Collaboration Web, built on TWiki, is a flexible, powerful, secure, yet simple web-based collaboration platform. This site can be used to run a project development space, a document management system, a knowledge base or any other groupware tool either on an intranet or on the Internet.

• See http://twiki.org/ For more gory details
Project Planning wiki

- GB.Planning
- Contains documents describing the projects underway, their milestones, and the plans for the current 6 weeks and quarter.
- Can be edited by any of the project managers or project planning committee members
- Can (soon!) produce nice hardcopies of the documents easily
- Maintains history, so that older versions can be retrieved
- We should maintain a wiki for each project, at some point.
I Can’t Wait! When can we start?

• **Now!**

• 1st 6 week planning meeting August 4th
• 1st Quarterly Review meeting mid-September
Review

• Projects are Temporary arrangements of effort and money to accomplish a goal

• Project Management is effort expended to ensure the success of a project

• In a Matrix organization, people are members of 2 groups. For matters relating to a project, they take direction from the project manager.

• We are developing a more advanced planning and tracking process
Our aim is to become more systematic in our planning - more effective, not more bureaucratic
Strong Matrix Organization
Weak Matrix Organization

Chief Executive

Functional Manager
  - Staff
  - Staff

Functional Manager
  - Staff

Functional Manager
  - Staff

Project Coordination
Balanced Matrix Organization

- Chief Executive
  - Functional Manager
    - Staff
    - Staff
  - Functional Manager
    - Staff
    - Staff
  - Functional Manager
    - Staff
    - Staff

- Project Manager

Project Coordination
Strong vs. Balanced Matrix

Balanced Matrix Organization

Chief Executive

Functional Manager

Staff

Staff

Project Manager

Staff

Functional Manager

Staff

Staff

Strong Matrix Organization

Chief Executive

Functional Manager

Staff

Staff

Manager of Project Managers

Project Manager

Project Manager

Project Manager

Project Manager

Staff

Staff

Staff

Project Coordination