Engineering and Software Services

All Hands Meeting
September 9, 2004
Agenda

- Acknowledgements
- Announcements
  - The Great Move of 04 - Wrap-up
  - Parking – how goes it?
  - Cafeteria Service
  - MC Plans
- FY04 Close-out & FY05 Look Ahead
- ESS After Hours Gathering
  - Pop survey...
- ESS Re-Organization
Acknowledgments

- The Planning Branches – completion of Two Gryo Phase A work.
  - Now waiting for end-to-end tests and tests with the spacecraft

- The Archive, Science Software, Data Processing, and Testing Branches – for imminent delivery of Multi-Drizzle

- Daryl Swade and Dave Taylor – Very successful Kepler DMC PDR presentation

- Others?
Announcements (1/3)

The Great 04 Move – wrap-up

- Division now in 4 (more or less) concentrated areas:
  - DESI, Archive, Data Processing, Testing – 3rd Floor Bloomberg
  - MAST/NVO/Galex group – 6th Floor Bloomberg
  - Planning Groups & Testing – Ground Floor Mueller
- PASS Branch is still come – before end of year; will be located on Ground floor
- Not everything is how we wanted it – but we can start considering how to fine tune what we have
- Thanks to everyone for their patience and support – it’s been noted and complemented on
- Special round of applause to Linda, Ann, and Lee for all the great support they provided us during the move
Announcements (2/3)

✿ Parking
  ■ How are folks finding what we have?
  ■ 15 spaces are available in Colonade at “no” cost
  ■ Plans are for the “Valley Lot” to open late Spring’05

✿ Cafeteria Service
  ■ Rodney’s contract was not renewed; last day will be about September 15th
  ■ Plans are to bring in a new caterer after fixing up the cafeteria itself
    ✷ Probably will be closed for 2 – 4 weeks during the refurbishment – but is supposed to be rather nice when completed
    ✷ Food will be more upscale than now
      ■ Has been sampled by several meetings held here over the past year
      ■ Cost($’s) is likely to increase
Announcements (3/3)

MC Plans

- Steve continues taking a very active role leading the organization
- Has set a direction for the MC to really get serious about strategic planning – especially in face of:
  - Potential re-compete of HST contract in FY06
  - To be ready to compete for TPF-C Institute proposal expected to come out within the next couple of years
- MC is planning an offsite retreat in October to focus on these topics
FY04 Close-out / FY05 Look-ahead (1/2)

Everybody breathe easy
- At the 95% confidence level – everything looks good for FY05
- As compared to this time last year (i.e. Sept’04)
  - ESS then had 118 FTE’s; ESS now has 109
  - Staff changes due to some (minimal) actions and several folks choosing to leave
  - Overall, the reduction were not as serious as we had first feared
    - Retention of some funding levels from HST; more funding from JWST; and new funding from Kepler – among others

Looking ahead
- See continual pressure on HST funding levels
- But also expect to start spinning up more JWST, Kepler, and other potential work
- We have good mechanisms in place to better track and prepare for changes – gives us more confidence in approaching future year discussions
Still some changes within Division to match up with the FY05 plan

- Shifts from HST to both JWST and Kepler
- Some shifts in funding within HST itself

- Generally speaking, these shifts shouldn’t affect more than 10 – 15% of the overall organization

- We will be meeting with the appropriate groups by end of month (September)
  - Plan on operating under the new plan with the beginning of FY (Oct 1)
ESS After Hours Gathering

- Not to be confused with the Institute’s own plans for a social event
  - Hey – who wants to argue over free food???

- Wanted to do something just for the Division
  - Allow us to mix and mingle
  - Celebrate – end of Summer, end of move, end of FY04, ...

- Pop Survey
  - Pizza or Ice Cream?
ESS Strategic Re-organization

Background
- 1st directive I received on taking the Division Head role was to begin a strategic planning process for the Division
- Initial swipes at it were more traditional:
  - Focused on our existing set of products (systems)
  - How we could make the products better...
  - How we could better market them

Problem – wrong start
- It’s not really our job to “make” and then “market” products
- Our job is to respond to the needs of the Mission Offices of the Institute – they are ones who are to define what work (products/systems/...) needs to be done
  - And they are the ones who get the $’s!
Restarted Our Thinking

- Done initially just Carl and myself
- Then brought in the rest of the ESS Division Office
- Iterated on/off this topic for almost a year
- Tried draft out on Mike
- Worked it again within the ESS DO
- Once passed Mike – brought in Leads
- Re-worked some of the concepts / other were strengthened
- Worked resulting draft with Mission Offices and other Directors (namely Lisa and Tom)
- Brought it before Steve
- Now bringing it to you
Engineering and Software Services

Strategic Organizational Forward Planning
September, 2004

Version 8/25/2004 @ 5:30 PM
ESS Mission Statement

ESS provides cost effective science enabling engineering services and software solutions to NASA and the astronomical community as requested and supported by the STScI Mission Offices.
Major Challenges facing ESS

- Change of focus from single major mission to multiple missions
  - Current branch structure was fundamentally created to support HST products
  - Branches should move away from specific products and focus on competency or skill domains

- Need to be highly dynamic in the area of staffing
  - There is uncertainty in future staffing levels
  - FY nature of funding puts pressure on divisions to increase/decrease staffing levels quickly
  - Durations of the work are significantly shorter than those experienced with HST

- Need to be more flexible in utilizing the existing workforce
  - Can no longer afford to have staff dedicated to singular efforts
  - Need to be able to deploy experts rapidly and backfill resultant holes

- Need to be competitive (or assist the Institute in being competitive)
  - Likely re-compete of HST contract in 2007
  - Constantly being unfavorably compared to Chandra and Spitzer
  - View products as STScI systems and look to leverage/reuse what we have to minimize costs for individual missions
1. Develop a dynamic teaming approach that is more responsive to the needs of the Missions

2. Adopt a staffing model based on abilities to do kinds of work (as opposed to supporting a product) and that (when needed) easily augments the Institute’s permanent technical workforce with qualified temporary staff

3. Identify the core competencies considered as most important for the Institute and then attract, retain, and professionally develop Institute staff that meet these competencies
Focus is on Teams – not Products

- Key to our success to date is having high powered, well focused teams that are directed at specific areas of the ground system

- Underlying goal is to build an organization that can create, support, and sustain such teams
  - ... and then re-absorb the staff into new work once a team’s work is completed
Key New Concepts

Branches – redefined to focus on the workforce (the staff) itself
  - Not directly concerned with products the workforce produces

Chief Engineers – defined to focus on the work in some particular “domain”
  - Domain is a high level concept for a broad area of work – like the Planning Systems or Data Management Systems
  - Not directly concerned with the staff
Teams in the New Organization

- Teams are formed to address specific work needs
  - Teams exist only as long as the work exists
  - Draw on the branches to populate with needed skills

- Teams are led by Project Leads
  - Project Leads are Institute staff that bring both technical expertise and corporate history to the work
  - Project Leads interact directly with Mission Offices on technical issues
    - Changes to technical scope, schedule, or staffing are worked through the Chief Engineer
  - Reports to Mission offices and Chief Engineers on schedule and resource issues
Chief Engineers

- Work flows to teams through Chief Engineers
  - Chief Engineers oversee the work
    - Negotiates the work packages, schedules and resource needs with Missions for a common collection of work
  - Coordinates the work associated with a system domain (e.g. Planning and Scheduling)
    - Assures consistency and compatibility for shared systems/components
    - Maximizes the leveraging of existing systems, works cross mission boundaries to assure smooth evolution of systems in response to changing mission needs while minimizing costs
    - Assures that the “right work” is getting done
Chief Engineers

Envision 3 Chief Engineers:

◆ Data Management Systems Chief Engineer
  ■ MAST/archive, science products and tools, data pipelines, interfaces to the archive, catalogs, ...

◆ Planning Systems Chief Engineer
  ■ Spike, Trans, PASS, SPSS/SCS, APT, Phase 1&2 Tools, GSS MOSS, STGMS, HST Commanding, JWST Scripting, ...

◆ Integration Chief Engineer
  ■ Ground & Flight Systems Engineering Products, Systems Integration/Acceptance products, Test Data Generation, JWST FOS, STScI System ICDs, Simulators, External (to STScI) Dependencies, PRDS and PRDOPS, ESS Development Toolsets, ...
Branches in the New Organization

Branches are discipline focused

- Responsible for the development of its defined core competencies
  - Manages the staff within the branch
    - Hiring, Timecards, Performance Appraisals, Termination, etc.
  - Monitors the quality (doing the work right) of the staff’s work
    - Best Practices, Coding Standards, Review Standards, etc.

- Supplies staff to all work (projects) requiring a particular skill
- Handles staffing level changes derived from mission needs
  - Includes selection of sub-contractors/consultants to augment Institute staff

Branches report directly to the Division Office

- Streamlines the organizational hierarchy
Branch Definitions (1/5)

◆ Astronomer Tools and Applications
  - User interfaces for Astronomers
  - Data Analysis
  - Data Prep (i.e. generic conversion)
  - Calibration
  - Exposure Time Calculators
  - Proposal Tools
  - the applications of OTFR

=>Driver: Providing science value/usability
Branch Definitions (2/5)

- Observatory Tools
  - Constraint Algorithms
  - Timing and orbital models/activities
  - planning/scheduling algorithms
  - from LRP -> SCS

=>Driver: Scheduling/constraint resolution algorithms
Branch Definitions (3/5)

Servers and Services
- Operator User Interfaces
- OPUS Core
- Archive Core
- DB Engineering
- PRDS
- Data receipt - through readiness for generic conversion
- Data distribution
- the mechanics of OTFR
- other primarily interface driven applications

=> Driver: COTS; interfacing with other apps/the OS; service/support oriented
Branch Definitions (4/5)

- **Spacecraft Systems**
  - Commanding
  - other flight s/w-like work
  - command load generation
  - PASS
  - PRD/PDB Operations

=> Driver: Spacecraft health & safety driven; attention to detail paramount
Branch Definitions (5/5)

- Systems Engineering and Test
  - Ground Systems Engineering
  - Testing and integration
  - Quality Metrics (i.e. how to measure/capture, not how to evaluate)
  - <<I might also include capacity planning/modeling, to degree we do it, in here>>

=>Driver: Process and Procedure development driven; need for consistency in approach/coverage
Updated ESS Org Chart

ESS Division
J. Pollizzi, Head
C. Johnson, Deputy

Division
Resource Mgr
D. Taylor

Division Scientist
S. Lubow

Chief Engineer
for Planning
Systems

Chief Engineer
for Systems
Integration

Ground Systems
Engineering and
Systems Testing
Branch

Observatory
Tools
and Applications
Branch

Servers and
Services Branch

Astronomy Tools
and Applications
Branch

Spacecraft
Systems Branch
Path Forward (1/3)

- Begin discussions with current Product Branch leads of new directions as soon as possible
  - Has already been started

- Inform staff of new organization
  - This All-Hands

- As Soon As Possible...
  - Identify current Department Heads as acting Chief Engineers
    - Already operating mostly within this role
    - Establish precedent for future work with the Mission Offices
Path Forward (2/3)

As Soon As Possible...

- Constitute the Project Teams – nominally using the previous leads as the Project Leads
  - Should be minimal change to current staff
    - (except as already noted in shifting allocations for FY05 plan)

- Work with current leads to identify staff with their appropriate new branches
  - Want the staff to know where we believe they would best fit in this new model
Path Forward (3/3)

- Develop Position Descriptions and Postings for the new positions
  - Department Heads to craft drafts of Chief Engineer descriptions
  - Branch Leads/Project Engineers to draft Branch Manager Description
  - Both groups will exchange drafts with each other for comment and review

- Division Office (Carl and Myself) to work with HR
  - To finalize drafts of the positions
  - To get the new positions posted
  - To form interview teams to consider the candidates
  - To make final selections for the new roles

- Plan on rolling out new organization in synch with the early part of FY05 (to degree possible)
Questions?