1 PROGRAM MANAGEMENT OVERVIEW

Project	Work complete	Status	Comments
FLAMINGOS-2	70%	Behind-schedule (from original baseline established in Feb'12)	Because design and experimentation time with L1 took longer than expected and we confirmed the need to do minimal upgrades to L2-L9, our schedule slipped by about another month in the last quarter pushing the delivery to the telescope to our original pessimistic date of February 2013. Descope was applied to all upgrades that can be executed after the shutdown.
GeMS	54%	Behind-schedule	Phase 7 of shutdown is finishing mid October. Systems will be ready for scheduled night-time in 2012Q4. Some shutdown tasks with lower priorities are rescheduled and will be implemented between runs until 2013Q1.
GMOS CCD	37%	On-schedule	Considers lab work to be done until May 2013 only.
GPI	NA	On-schedule	Re-baselined after actuator failure in May. Expected delivery at telescope early 2013Q2.
GHOS	~25%	On-schedule	Preliminary Design Phase scheduled to start by mid-January. The overall project schedule will be refined at PDR but currently calls for science operations in 2016.
GRACES	~28%	Behind-schedule	Difficulty with throughput of long fibers, work outsourced to industry. Project re-baselined. Expected first light in April 2013.
A&G-2	NA	Behind-schedule	On-going work with requirements, ICDs, and Study tasks. Feasibility study and cost/benefit analysis underway that reviews project alternatives addressing cost constraints so formal RfP release pushed until 2013.

In general, most resources available outside of operations were assigned to priorities #1 (FLAMINGOS-2) and #2 (GeMS) causing some of the other projects to make slower progress.

2 PAST/CURRENT PROJECT ACTIVITIES

- **FLAMINGOS-2**
  - The new L1 lenses were received from 2 vendors in July and August (one of them was shipped back to the vendor because of missing acceptance data). We had L7 chipped edge stoned and polished by a vendor and also made a spare, and finally we purchased a spare for L9 as it showed signs of internal stress while mounted. We purchased a stress analyzer to ease our lens inspection.
  - Our FEA contractor processed all the data measured in-situ with the broken lens and provided detailed analysis for our final L1 cell design, validating the low mechanical stress in all conditions (in particular because of the large area contact pad concept). The hardware was made in a precision shop in Santiago and received early September.
  - The first thermal cycle of the old lens into the new cell late happened mid-September and achieved a cold temperature of 190K. We used the data from the multiple sensor to model improvements (thermal bridge from MOS bench to cell pads). The second thermal cycle confirmed we cold temperature is between 145K and 165K depending if a mask is inserted or the wheel opened to the entrance window.
  - OIWFS was tested successfully and we have hired the services of HIA to support its realignment in November.
  - We did a metrology of all the camera and collimator lenses and practiced their integration in their cells. In parallel we re-examined the risks for the rest of the optical train (L2-L9) and developed a minimal mitigation strategy to prevent mounting stress and tilt misalignment (inherent to design when cold).
- **GeMS and GSAOI**
  - NGSWFS upgrades to improve throughput were only partly successful: a new technique was used to assemble the optical components injecting light into the APD fibers but the good data obtained in the lab was not repeated inside Canopus because of missing degrees of freedom for alignment. We will review next year how to continue with those upgrades.
  - Real Time Computer (RTC) hot spare was partly built but not fully tested yet.
  - Miscellaneous BTO and laser upgrades to ease alignment and increase reliability.
  - A new chiller (#3) was installed in the plant room for laser system
  - GSAOI: new scheme implemented for cryo-cooler control ; Detector Controller and Component Controller occasional crashes were investigated and fixed ; the filter wheel #1 was fixed but failed again when cold forcing a dewar opening early October.
- **GMOS CCDs**
  - The custom signal conditioning board was characterized and validated, making the noise comparable to the required levels (3e- in slow readout mode and low gain, 5e- in fast mode and high gain).
  - The new blue CCD was tested in our lab in Hilo and accepted.
  - The new test dewar was received to enable testing of the full focal plane array in the lab.
- **GPI**
  - Various remediations conducted in during 2012Q3, in particular the fabrication and installation of new Lyot mask to hide the failed actuator, control software, cryocoolers of the IFS, calibration source.
  - Miscellaneous measurements (e.g. radiometry/ throughput for sub-systems and end-to-end) and troubleshooting/pre-acceptance verification (e.g. calibration unit, Non-Common Path Aberrations suppression) ongoing.
  - Project was re-planned until delivery.
- **GHOS**
  - External cost analysis received early July
  - Gemini compiled all the information and made a recommendation validated by STAC, then approved by Board in August to initiate contract negotiation with one vendor.
  - Meeting held with vendor in September to discuss all contract details.

- **GRACES**
  - Measurements of transmission of 280m long fibers at HIA are not meeting specifications due to Focal Ratio Degradation (FRD). Decided to Outsource to a vendor in September. FRD requirement relaxed from <10 to <15%.
  - Control and interface software to ESPaDOnS was finished by Gemini SW engineer.
  - Image slicer design finished and purchased.
  - Mockup presented inside ESPaDOnS to verify space for coupling module.
  - On-going design work on injection module in GMOS cassette.
- **A&G-2**
  - Science requirements updated to version 7.
  - Several new resources (system/electronics/software engineering) were injected into the project to review original requirements, control flow and ICDs and start updating them.
  - Project charter and business case for main option was update to calculate the return over investment period.
  - Qualitative failure mode analysis was finished and opens the door for a descoped project (i.e. not building 2 completely new units).
  - Limited funding available for FDF was confirmed by NSF and Board and also calls for descoped project too (project is cost-driven).
  - Work focused on identifying all project alternatives and running cost/benefit analysis.

3 COMING PROJECT ACTIVITIES (next quarter)

- **FLAMINGOS-2**
  - Install new L1 lens in new cell and run thermal cycle to validate new design by end of October.
  - Modify all L2-L9 cells by early November and re-install and align the optical train by end of November. Optimized alignment and image quality for full-compatibility with MCAO will not be ensured in this integration and could be part of a future shutdown.
  - Re-align OIWFS mid November with HIA.
  - Complete instrument integration and cool-down early December. January will be dedicated to testing on flexure rig and acceptance testing of all changes. Our target date to be back at the telescope is the second half of February.
- **GeMS and GSAOI**
  - LGSF Technical run (#1) happened Oct 19-21 with satisfactory results. Run #2 early November will resume full optimization of Canopus and GAOI if the later is fixed on time.
  - Commissioning of laser chiller between runs.
  - Fabrice Vidal, a new AO scientist, has joined our team at Gemini South and another temporary position is opened to enable smooth transition to science operations in 2013 (we expect a full year to stabilize completely the systems and simplify operations to a long-term cruising mode).
  - Systems Verifications Campaign will start late November until January 2013.
- **GMOS CCDs**
  - A custom board to provide Electro-Static Discharge (ESD) protection is being designed and will be mounted inside the GMOS dewar.
  - A new test dewar is being prepared to integrate, align and test the whole focal plane array (3 CCDs) by the end of the year. At this point the system could be kept operational for additional testing and reliability purpose (‘burn-in’).
  - In order to clarify priorities for 2013 (a busy year with up to 5 commissioning expected between both sites), it was decided to postpone the installation of the new CCDs into GMOS until 2013B. This will likely be done first at Gemini South if the queue is properly filled by GeMS and F2. Installation in the other GMOS is scheduled for 2014A.

- **GPI**
  - Resume system characterization in October
  - Prepare for the pre-delivery acceptance test stage starting in December.
  - Expected delivery at GS is now in April 2013.
- **GHOS**
  - We expect to submit the final contract to NSF signature in November with a kickoff meeting for Preliminary Design (PD) Phase tentatively scheduled for December.
  - PD Review expected around 2013Q4.
- **GRACES**
  - Finish injection module design and launch fabrication.
  - Expect fiber assembly to be done by December.
  - Expect image slicer delivery late December.
  - Start installing hardware for fiber routing inside the Gemini telescope building.
- **A&G-2**
  - Decide on future steps with Governance. Resource allocation is an issue until March when we expect GeMS and F2 have moved to science operations. An internal feasibility study of the main project alternatives is being performed in 2012Q4.

4 OTHER DEVELOPMENT TEAM ACTIVITIES

- **LGS+P1 mode for Altair (100% sky-coverage and 'super seeing'-like image quality)**
  - Some progress made but commissioning slowed by bad weather. Mode fully supported in 2013A.
- **Gemini Users Meeting (July 17-20)**
  - A few dedicated sessions were held by the STAC about instrumentation, AO workshop science outcomes and Long Range Plan.
- **Long Range Plan**
  - A internal team composed by Gemini science staff was created to support the Long Range Plan (LRP) process. Some financial scenarios and proposals to use Instrument Development Fund (IDF) were prepared for the STAC and Board to review.
- **Gemini-North AO workshop report**
  - Following the workshop held in Victoria in June, a comprehensive science report was written (led by D.Crampton and J.Christou heading the organizing committee). A basic report on the technology options was subsequently prepared by Gemini staff to answer the questions asked by the Board and STAC in April. This report will be discussed in October and November with the governance bodies as part of the Long Range Plan.
- **IR Detector Controller project**
  - Project was moved into planning mode. Quote for SDSU controller obtained. Discussion and planning for SW effort which is the current bottle-neck for in-house execution.
- **Discussion of collaborations**
  - Subaru has contacted us to discuss possible collaborations about a new AO system based on an Adaptive Secondary Mirror (ASM) for GLAO.
  - We have asked CFHT to present an update on the collaboration for SPIRou (IR high-resolution spectrograph).
  - We have started brainstorming future procurement models to ensure continuity post-Transition.