Gemini Gen 4#3 Steering Committee:

Report on the development of The Gen 4#3 Request For Proposals

Report Date: March 31, 2016

Participation:

Committee Members:

- Michael Balogh
- Tom Barnes
- Chuck Claver (Chair)
- George Jacoby
- Sarah Martell
- Dave Palmer

Gemini Representatives:

- Catherine Blough
- Ruben Diaz
- Stephen Goodsell
- Scot Kleinman

Summary:

This report contains comments and recommendations by the Gemini Gen4#3 Steering Committee on 5 key areas of questions related to the development of the Gen4#3 Request For Proposals (RFP). Stephen Goodsell and his team provided the committee with following materials for our consideration:

- Gen 4#3 Steering Committee - Questions v5
- GIFS Assessment Report v1.1
- STAC Report from December 11, 2015
- STAC Report from October 29-30, 2015
- Resolution from the November 4-6, 2015 Gemini Board Meeting

The committee met twice, March 16, 2016 and March 30, 2016, to review the submitted questions with Stephen and his team. The questions from the 5 key topical areas and the committee's comments and recommendations are provided below.

Committee Comments and Recommendations to Key Issues:

1. Guiding Principles:

Question: Considering the GIFS Assessment Report, do you agree that the order of importance should be: core capabilities, then schedule, then budget and then additional capabilities?

The Steering Committee concurs with the STAC and the GBoD that the guiding principles for the Gen 4#3 instrument procurement be ordered as presented:

- Meeting a set of “core” capabilities
- Meeting a set of “core” capabilities to schedule [LSST Operations]
- Meeting a set of “core” capabilities to schedule and budget
- Meeting a set of additional capabilities to schedule and budget

2. Core Capabilities:

Core capabilities	**Value**	**Notes**
Spectrographic		
Wavelength range	0.4 to 1.6 micron	STAC recommended
Simultaneous coverage	Yes	GIFS studies
Continuous coverage	Yes	GIFS studies
Resolving power	>4000 with a 1” slit	STAC recommended
Minimum spatial sampling	<0.2” at V, <0.15” at H	IQ-20 conditions
Imaging		
Imaging FOV	>85”x45”	GIFS studies
Spatial sampling	<0.2” at V, <0.15” at H	IQ-20 conditions
Performance		
Throughput	xx% at 4000A, xx% at 7000A, xx% at 1 micron, xx% at 1.5 micron	Needs numbers
Target acquisition time (Instrument allocation)	<120s	First guess - once slewing etc is complete
Nighttime calibration time	Minimize	Needs a number?

Question: Considering the GIFS Assessment Report, do you agree with these set of core capabilities?

Recommendation: "Reliability" or "up-time" should be added as a core performance capability. This performance should be maximized. The intent is to ensure the proposed instrument is a robust "workhorse" type instrument that doesn't require much if any handholding or finesse.

Recommendation: Simultaneous multi-channel imaging should not be a required core capability. Instead simultaneous multi-band imaging should be considered as an additional capability and given "medium" priority.

Recommendation: The RFP should make clear the desire for the spectrometer to include the capability to obtain spectra of spatially resolved targets.

Question: Are there values we can assign to the performance core capabilities based on the GIFS studies, or should we allow proposers to provide values for these parameters for us to evaluate?

Recommendation: Target values for core performance capabilities of "Throughput" and "Target acquisition time" should be given. In the RFP it should be made clear that these target values are not "shall meet" requirements and can be interpreted as "goals".

3. Additional Capabilities:

Desired capability	Parameter/statement	Relative priority
Wavelength range	Extending into K band	High
Simultaneous multiband imaging	>2 bands	Medium
AO system	Taking advantage of	Medium
IFU	Inclusion of	Medium
Wavelength range	Extending into U band (within telescope capabilities)	Low
All other additional capabilities		Low

Question: Based on the GIFS Assessment Reports, do you agree that their relative priority is appropriate?

Recommendation: Extending the wavelength range to the UV (e.g. the blue limit of the telescope) should be rated as a "low" priority.

4. Schedule:

Given the importance of schedule and the creation of the Request for Proposals Documentation Set (which includes the Statement Of Work), we suggest including the following:

- Having a baseline project structure of 6 stages (Conceptual Design, Preliminary Design, Critical Design, Build, Telescope Integration & Commissioning) and allowing proposals to deviate from the structure if they can demonstrate that the overall risk to the project (schedule, budget, requirements) will be less. [I.e. a team may propose to start with the Preliminary Design Stage if they can demonstrate their concept is sufficiently mature, or propose separate optical, mechanical, etc Critical Design Review if they demonstrate the overall risk to the project is less.]

- Baseline contracting a single team (rather than baselining 2 teams and down selecting at the Conceptual Design Review). We would make a final decision based on assessed overall risk proceeding with the first choice proposal.

- As an additional incentive to meet schedule, Gemini propose awarding telescope time for meeting stage milestone targets.

Do you agree? Do you have any other suggestions that would help retain schedule?

Comment: The RFP should allow some flexibility in the 6 stages of the project. For example, if long lead items are identified during the design phase, the "build" phase for these can be started early. For example, the DOE Critical Decision process allows CD3a (purchasing of long lead items) to occur prior to CD2 (Preliminary Design).

Comment: The conceptual design phase could be abbreviated or even eliminated if the winning bid contains an advanced instrument design.

Recommendation: Given the GIFS process and assuming the successful bidder has an advanced instrument design, the competition aspect of the conceptual design phase should be eliminated to expedite the schedule. However, if a team with a new concept proposes and is found credible a conceptual design stage may be warranted.

Recommendation: Restructure the incentive program to make clear the following conditions:

- Meeting a milestone locks in the associate award nights;
- Missing a milestone causes the associated award nights to be lost; and
- However, achieving a subsequent milestone will recover lost nights, locking them in as though the original milestone(s) was(were) met.

Comment: Requiring a minimum of 15% schedule reserve for the contractor appears to be about right.

5. **Budget:**

Given the GIFS study reports we want to provide a budget that will comfortably cover the costs of a team delivering the core capabilities and provide the possibility of obtaining additional capabilities.

- We suggest making $15m available for the Gen 4#3 contract.
- Compensate in-kind contribution reducing the total cost to AURA to below $15m with telescope time. (No of nights for the team to propose)
- As an additional incentive to meet budget, Gemini propose awarding telescope time for meeting stage milestone targets.

Do you agree? Do you have any other suggestions that would help retain budget?

Recommendation: Retaining the increased budget from the original $8M-12M to $15M is prudent given the complexity and scope of the desired instrument.

Comment: In spite of the increase, $15M may even be tight considering this amount includes 15% “risk mitigation” funds. In essence, the base budget for the instrument is ~$11.5M with 15% team held “risk mitigation” funds and an additional 15% of “risk mitigation” funds held at the Observatory level. The overall 30% “risk mitigation” margin seems about right at the early stages of a proposed project.

Recommendation: The same conditions for awarding nights from schedule performance should also apply to the budget incentives.

Recommendation: The RFP should include specific instructions to provide a scope reduction plan to recover budget and/or schedule if any of the “additional capabilities” are proposed. Further, the descope plan should indicate how the “core capabilities” are retained with descope.