

#### NGAO Real-Time Controller Mini-Design Review

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# Agenda

- 10:00 am: Welcome and introductions
- 10:05 am: Presentation
- 10:30 am: Response to reviewers' questions
- 11:15 am: Open discussion and questions
- 12:00 pm: Review committee closed session
- 12:30 pm: Review committee feedback to team



### Charge to reviewers

- Evaluate the design for
  - Technical feasibility and design completeness
  - Satisfies requirements
  - Risk is manageable
  - Approach is cost effective
- In scope of review:
  - Real-time (50-100 frames/second) hardware and software
  - Algorithms
- Not in scope
  - Supervisory control, user interface
  - Enclosure / environment control



## Requirements

- RequirementsSpreadsheet\_RTC
- Requirements Issues:
  - A large number of TBD's were filled in by the RTC team with "reasonable values"
    - Latency times (FR-1406)
    - Update rates (FR-1436)
    - Data transmission rates (FR-1437, FR-1456)
    - Uptime (FR-1449)
    - Bootup & shutdown time (FR-1454)
  - Many requirements are vaguely specified, or irrelevant references to an old architecture
    - Doesn't distinguish tomography from point-and-shoot guidestars (FR-1401, FR-1406)
    - TWFS processing included in RTC (FR-1411, FR-1412)
    - Presumption that RTC processes parametric data (FR-1426)
  - Several requirements needed are missing
    - Vibration control
    - Operational zenith angle range
    - Performance requirements on the P&S AO loops
    - Use NGS WFS as an alternative LOWFS source





Compliance Key:	
in compliance	
unresolved	
push back	

## Requirements (2)

- More Guidance is Needed (from the System Engineering Team or the "Nasmyth Czar"):
  - Power usage constraints
  - Weight and Volume constraints



# Jointly with the AO Control team, we need to more fully define the AO Controller's RTC support operations

"The RTC is a slave subsystem of the AO Control System" (FR-1403 rationale)



Figure from KAON 569 Non-Real-Time Controls System Design Report

- Translation of "familiar" parameters to the forms needed by the RTC
  - $S_x$ ,  $S_y$ ,  $S_{yn}$ , Q, etc., from the Algorithms Document depend on Cn2, wind;  $E_{TT}$  depends on TT star constellation
- Scripting of the calibration and observation setup steps
- AO configurations and files management



#### **RTC** Design





Figure 4 Top-level view of the AO Control's View of the RTC















#### **Reviewers' Questions**

