

LSST CAMERA PROJECT OFFICE

TO:	LSST senior leadership
FROM:	Vincent Riot and Steve Ritz
SUBJECT:	Agreement to proceed with non-compliant CCDs
DATE:	April 27, 2018

This memo is to document the agreement to proceed with assembly of science rafts with noncompliant CCDs.

Background: The baselined design of the LSST Camera has 189 CCD sensors in the science focal plane. Sensors are obtained from two vendors, E2V and ITL. The latter has experienced manufacturing issues causing a large fraction (~50%) of the otherwise good sensors to exhibit high read noise, beyond the 9e- rms requirement, when integrated with LSST electronics, and small-to-moderate violations of other requirements, most notably CTE (requirement 1-5x10⁻⁶). See attached document (LPM-262). Based on quantities projected to be available from the two vendors, the Camera Project now plans to deliver 13 science rafts (9 sensors per raft) constructed with E2V sensors, which are expected to be compliant with requirements, and 8 (+1 spare) rafts with ITL sensors expected to contain at least some non-conformant sensors. Having developed a method to detect these sensors at the vendor, the Camera project has been setting them aside, in favor of assembling rafts with all remaining available sensors without these issues.

It has now become necessary to dip into the population of compromised ITL sensors to complete the Camera. The lead time to purchase more sensors from either E2V or from ITL is estimated to be 8 to 11 months, and given previous issues, there would be significant risk of additional sensor production delays. The cost per sensor would be \$50K to \$150K, with roughly 40 replacement sensors needed. The Camera Project has only ~8M of contingency left with \$6.5M of risk-based cost exposure at the 80% confidence level and the project has only 8.5 months of schedule float. Most importantly, the Project Science Team has concluded, as summarized in LPM-262, that use of these sensors is acceptable, with only small impacts on the current best estimates of performance against the requirements in the Science Requirement Document (SRD) as a result. As LSST is still projected to meet the SRD requirements, large delays and cost increases are not warranted.

The LSST Project and the Camera Project Office have reached the agreement to proceed as outlined above with raft construction. ITL-based rafts will be populated with the sensors predicted to provide the best performance, based on requirements and the prioritization discussed in LPM-262. As always, each raft will be tested, and every non-conformance documented and submitted for review and approval via the LSST Change Control Board (LCR process).

The Camera Project Office



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