



**National Science Foundation**

4201 Wilson Boulevard  
Arlington, Virginia 22230

Office of Inspector General

**MEMORANDUM**

**DATE:** September 30, 2014

**TO:** Jeffery Lupis, Director  
Division of Acquisition and Cooperative Support (DACS)

**FROM:** Dr. Brett M. Baker   
Assistant Inspector General for Audit

**SUBJECT:** NSF OIG Audit Report No. OIG-14-1-005, Independent Audit of Association of Universities for Research in Astronomy (AURA) Cost Book Evaluation for the Rebaselined ATST/DKIST Project

We contracted with the Defense Contract Audit Agency (DCAA) to complete an audit of AURA's cost book proposal dated September 16, 2013, rebaselined in the amount of \$344.1 million, for the construction of the Daniel K. Inouye Solar Telescope (DKIST), formerly the Advanced Technology Solar Telescope (ATST). AURA submitted its proposal in response to NSF cooperative agreement AST-0946422, and proposed a performance period of 2010 to 2019. The purpose of this audit was to determine if AURA's proposed costs comply with applicable federal requirements and are acceptable as a basis for negotiation of a fair and reasonable price. DCAA's final report is attached to this memo.

**Summary**

DCAA disclaimed an opinion on AURA's cost proposal, due to the significance of AURA's estimating deficiencies found in the proposal, including unsupported estimates, outdated vendor quotes, and unallowable contingencies. DCAA was unable to obtain sufficient evidential matter on which to base an opinion on the proposed material (\$[REDACTED] million), direct labor (\$[REDACTED] million) and contingency (\$46.6 million) cost portions of AURA's proposal, which (totaling \$322.4 million) comprise nearly 94% of AURA's \$344.1 million cost proposal. The report stated, "In summary, AURA did not support the material cost in their proposal using adequate cost or pricing data, they did not use actual costs in the rebaseline of the proposal when actual costs do exist, and they included costs that were explicitly unallowable per the OMB circular regulations." DCAA further stated that "the data provided to us is so significantly flawed" that it... "renders us unable to perform a GAGAS-compliant audit."

We noted that the same or similar deficiencies have been documented at AURA for four years, and this report confirms that AURA has not corrected these deficiencies or improved its proposal estimating practices. Because DCAA could not affirm that the proposed costs are acceptable as a basis for a fair and reasonable price, NSF can have no assurance that the proposal is an

acceptable basis for funding. Further, the inadequacy of this cost estimate directly impacts the recipient's ability to properly monitor and manage federal funds.

## Background

In 2010, auditors attempted twice to determine whether AURA's initial \$298 million construction cost proposal was acceptable for audit. Both times, the auditors arrived at the same result that AURA's ATST proposal was unacceptable for audit.

The first inadequacy memo cited four major deficiencies: unsupported estimates and outdated vendor quotes; lack of support for labor costs; lack of support for indirect cost; and unallowable contingencies. Six months after this first attempt and after DCAA evaluated additional information that AURA provided, DCAA issued a second inadequacy memo in October 2010, which found that none of the four the previously cited deficiencies had been corrected and again concluded that the proposal was unacceptable for audit. Therefore, we recommended that NSF:<sup>1</sup>

1. Request AURA to revise and resubmit an adequate ATST proposal based on current, accurate and complete cost data that is acceptable for auditing purposes. This revised proposal should include a detailed "basis of proposal" statement that explains the basis for all proposed costs; identifies the basis/rationale for all engineering estimates used in calculating proposed costs; and provides all reconciliations and calculations needed to arrive at proposed costs. AURA should also provide cost/price analysis for its proposed subcontracts showing the basis for establishing source and reasonableness of price.
2. Require AURA to remove unallowable contingency provisions from its proposed budgets for ATST and discontinue NSF's practice of funding contingencies. Instead, NSF should require its awardee to submit proposed budgets supported by auditable, current, accurate and complete cost data, request independent audits of the awardee's proposed budgets prior to funding, and base NSF funding on the results of audit.

Subsequent to the two inadequacy memos, in 2011, DCAA issued an audit of AURA's accounting system and proposal estimating practices.<sup>2</sup> The audit found eight significant deficiencies, such as a lack of policies and procedures for subrecipient monitoring and failure to adequately identify receipt of funds by project, which could result in expenditures exceeding budgeted amounts for projects. Regarding AURA's practices for estimating costs, DCAA found that AURA did not have documented estimating policies and procedures or an effective process for preparing adequate proposals. The adequacy of the cost estimate directly impacts the recipient's ability to adequately monitor and implement critical financial controls post-award. Thus, the auditors concluded that AURA's "accounting system and estimating practices are not adequate to merit the receipt of a cooperative agreement."

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<sup>1</sup> NSF OIG Audit Report No. 11-1-001, *Audit of AURA's Cost Book Proposal for the ATST*, dated March 31, 2011

<sup>2</sup> NSF OIG Audit Report No. 11-1-010, *Audit of AURA's Accounting System and Proposal Estimating Practices*, dated March 31, 2011

In June 2012, at our request, DCAA briefed AURA and NSF on the continuing deficiencies in AURA's cost proposal and estimating practices. In September 2013, AURA provided a revised ATST cost proposal, which it had re-baselined at NSF's request. However, as the August 2014 audit being transmitted with this memo concluded, due to the significance of AURA's estimating deficiencies, DCAA could not affirm that AURA's rebaselined cost proposal was acceptable as a basis for negotiation of a fair and reasonable price.

For four years, audits consistently have documented significant deficiencies in AURA's ability to properly manage federal funds. The audits have demonstrated a pattern of repeated, longstanding estimating practice deficiencies which directly impact AURA's ability to properly monitor and manage federal funds. In light of AURA's known, continuing, and serious estimating deficiencies, we are also concerned about the reasonableness of AURA's proposed costs and its management of federal funds in connection with the recently awarded \$467.7 million Large Synoptic Survey Telescope (LSST) project, which will also be conducted under a cooperative agreement with AURA.<sup>3</sup>

#### **DCAA's Disclaimer of Opinion on AURA's Rebaselined DKIST Cost Book**

Due to the significance of AURA's estimating deficiencies, DCAA disclaimed an opinion on AURA's rebaselined DKIST cost book. The report explained, "In summary, AURA did not support the material cost in their proposal using adequate cost or pricing data, they did not use actual costs in the rebaseline of the proposal when actual costs do exist, and they included costs that were explicitly unallowable per the OMB circular regulations." DCAA stated that "the data provided to us is so significantly flawed" that it... "renders us unable to perform a GAGAS-compliant audit."

Below, by funding source, is the rebaselined DKIST Total Cost Book Summary. ARRA is the American Reinvestment and Recovery Act, and MREFC is Major Research Equipment and Facilities Construction.

	<u>ARRA</u>	<u>MREFC</u>	<u>Totals</u>
Contingency	\$ 1,886,166	\$ 44,745,373	\$ 46,631,539
Indirect			
Travel	4,419,567	3,484,040	7,903,606
Total	<u>\$ 146,000,000</u>	<u>\$ 198,129,000</u>	<u>\$ 344,129,000</u>

<sup>3</sup> NSF OIG Alert Memo Report No. 14-3-002, *NSF's Management of Costs Proposed for the Large Synoptic Survey Telescope Construction Project*, dated September 30, 2014

Specifically, the report notes problems with the cost proposal in the following areas:

- Material Evaluation** AURA did not provide adequate supporting documentation for the majority of its material cost (approximately \$[REDACTED] million). The support was not based on current, accurate and complete cost or pricing data, despite AURA having certified its cost book as such and informing the auditors during the proposal walkthrough that updated quotes were used in the two-year old proposal. The report notes that the majority of the data in the material section was based on an outdated subcontractor agreement where AURA developed a payment schedule which was not in the agreement (instead of using updated vendor quotes); the costs could not be tied back to source documentation; and several categories of costs were not properly classified. The majority of the material costs are actually made up of subcontractor costs for tasks such as labor and travel. Labor services, travel and other direct costs were improperly accounted for under the material section of the proposal. This can affect pricing as different indirect rates apply to different types of cost. Further, the report stated that AURA did not provide requested support for sampled material items in a timely manner and never provided requested cost/price analysis, although maintenance of these data is a requirement of AURA's policies and procedures and 2 CFR 215.45. Therefore, DCAA could not render an opinion on the reasonableness of the proposed costs.
- Incurred Costs** For FYs 2010 through 2013, the report notes a total overstated difference of nearly \$8.8M (not including an additional \$2.9 million in contingency costs) between AURA's rebaselined proposal amount and its A-133 audit report of actual incurred costs. This was despite AURA's telling the auditors during the entrance conference that actual costs were included in the rebaselined proposal. However, when the auditors asked AURA to explain the differences found during the audit, an AURA official told the auditors that numbers in the cost book were budgeted amounts that did not include actual expenses. The report explains that, for fiscal years completed at the time of rebaseline, no budgetary data should be used since the costs had already been incurred. The report further notes that the cost book was certified as current, accurate and complete; and, if budgeted values were used for completed years with known, audited actuals, then the information proposed is not the most current and accurate information available. For FYs 2010-2012, differences were noted between the proposed amounts in the cost book, the amounts shown in the A-133, and the amounts in AURA's accounting systems ([REDACTED] none of which match or were reconciled. For FY 2013, the auditors calculated the mathematical difference between the proposal and the A-133 amount, and found significant differences between the estimated and actual costs. Additionally, for 2013, the auditors asked for the most current version of the costs by cost element by year to review the updates made for FY 2013 forward, but AURA did not provide it.
- Contingency** The report states that the entire amount of proposed contingencies (over \$46.6 million) is unallowable per 2 CFR 230 (OMB A-122), which states, "*Contributions to a contingency reserve or any similar provision made for events the occurrence of which cannot be foretold with certainty as to time, intensity, or with assurance of their happening, are unallowable...*" The report acknowledges that AURA is following the NSF Large Facility Manual, (which instructs them to develop contingency reserves) but states that this manual

does not follow the OMB Circulars (which prohibit such reserves). The report concludes that the Circulars are the overarching regulations that must be followed, and no other guidance can override these regulations.

### **DCAA's Comments on AURA's Organization and Systems**

- **Accounting System** The report states that DCAA performed a preaward survey of AURA's accounting system, but had not performed a post-award accounting system audit at AURA. The scope of DCAA's preaward accounting system audit was limited to the design of AURA's accounting system, whereas a post-award accounting system audit would determine if the accounting system is adequate for accumulating and billing costs to NSF. Without a post-award accounting system audit, there is no assurance that policies and procedures developed by AURA have been satisfactorily implemented and are working as intended.
- **Estimating System** The report also states that DCAA has not reviewed AURA's estimating system and related internal controls. To provide recommendations to eliminate the deficiencies in estimating practices found repeatedly at AURA, an audit of AURA's estimating system and related internal controls audit is clearly needed.

We made recommendations for NSF to obtain both a post-award accounting system and an estimating system audit of AURA in our previously cited alert memo on NSF's management of the LSST construction project, another project managed by AURA.

### **Conclusion**

After over four years of attempting to audit proposed costs in AURA's ATST/DKIST cost book, DCAA continues to report lack of adequate documentation to determine if the costs are fair and reasonable. Also, in one significant instance (proposed contingency), the auditors state that NSF's Large Facility Manual conflicts with federal requirements. The repeated estimating deficiencies demonstrate lack of improvement on the part of both AURA and NSF and heighten our reported concerns (pre-and post-award) about unsupported costs being proposed and included in high-dollar, high-risk awards.<sup>4</sup> DCAA's findings also underscore the need for an estimating system and a post-award accounting system audit of AURA.

### **Recommendations**

In view of AURA's estimating system and incurred cost deficiencies found in this audit and the over \$344 million of taxpayer dollars at risk, we recommend that the NSF Director of the Division of Acquisition and Cooperative Support take appropriate action to ensure that the deficiencies are fully addressed and corrected before funding any additional amounts for the

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<sup>4</sup> NSF OIG Alert Memo, Report No. 12-6-001, *NSF's Management of Cooperative Agreements*, dated September 28, 2012

DKIST project or finalizing DKIST project costs. Such actions would include requiring that AURA:

1. implement policies and procedures designed to correct the significant estimating and incurred cost deficiencies found in this audit to ensure the adequacy of all future proposed budgets, annual program plans, and incurred cost submissions to NSF;
2. submit a revised cost proposal for the DKIST project containing only budgeted costs that are current, accurate, complete and adequately supported; and demonstrate to NSF that the revised cost proposal corrects all cited deficiencies, including reconciling the incurred cost portion of the proposal to AURA's A-133 reports and to its accounting records;
3. remove unallowable contingency provisions from its proposed budgets for DKIST unless and until AURA demonstrates a bona fide need for the funds supported by adequate supporting documentation; and
4. provide annual incurred cost submissions to NSF for FYs 2010 and forward (including the DKIST project among all of AURA's NSF projects) to provide NSF with increased visibility to perform its management functions of AURA and a baseline on which AURA's incurred costs could be readily audited to ensure that costs are reasonable, allocable and allowable.

In accordance with OMB Circular A-50, please coordinate with our office during the six-month resolution period to develop a mutually agreeable resolution of the audit findings. Also, the findings should not be closed until NSF determines that the recommendation has been adequately addressed and the proposed corrective actions have been satisfactorily implemented.

We are providing a copy of this memorandum to the DKIST Program Director and the Director of Large Facilities Projects. The responsibility for audit resolution rests with DACS. Accordingly, we ask that no action be taken concerning the report's findings without first consulting DACS at (703) 292-8242.

### **OIG Oversight of Audit**

To fulfill our monitoring responsibilities of DCAA's work, the Office of Inspector General:

- Reviewed DCAA's approach and planning of the audit;
- Evaluated the qualifications and independence of the auditors;
- Monitored the progress of the audit at key points;
- Coordinated periodic meetings with DCAA and NSF officials as necessary to discuss audit progress, findings and recommendations;
- Reviewed the report prepared by DCAA; and
- Coordinated issuance of the report.

DCAA is responsible for the attached report on AURA and the conclusions expressed in that report.

We thank you and your staff for the assistance extended to us during the audit. If you have any questions about this report, please contact Jannifer Jenkins at (703) 292-4996 or David Willems at (703) 292-4979.

Attachments:

DCAA Audit Report No. 4301-2014A17900001, *Independent Audit of Association of Universities for Research in Astronomy (AURA) Cost Book Evaluation*, dated August 22, 2014

cc: Martha Rubenstein, BFA  
Mary Santonastasso, DIAS  
Craig Foltz, AST  
Matthew Hawkins, LFO  
Fae Korsmo, OD  
Michael Van Woert, NSB  
Ruth David, NSB

# Defense Contract Audit Agency



United States  
Department of Defense

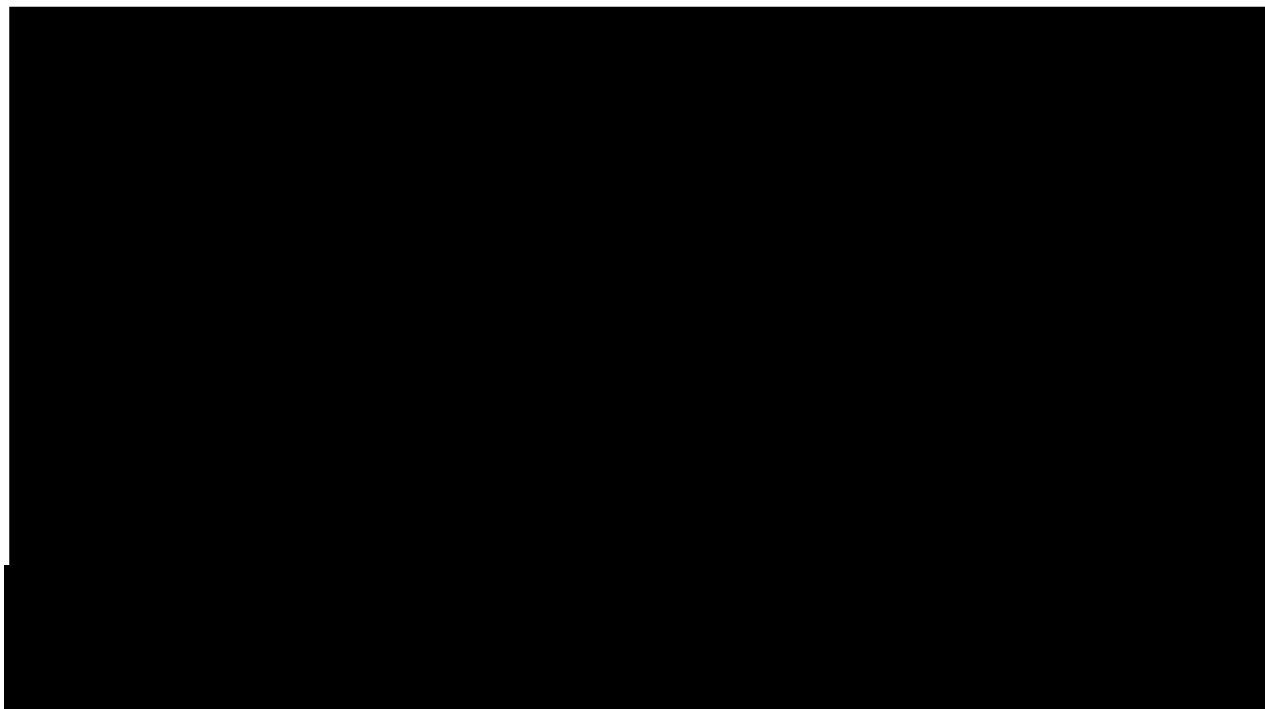


August 22, 2014

Independent Audit of Association of Universities for Research  
in Astronomy (AURA)  
Cost Book Evaluation

**AUDIT REPORT NO. 4301-2014A17900001**

RESTRICTIONS:





## DEFENSE CONTRACT AUDIT AGENCY

**PREPARED FOR:** Assistant Inspector General for Audit  
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**PREPARED BY:** DCAA Arizona Branch Office

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**REFERENCES:** Relevant Dates: (See Page 3)

**AWARDEE:** Association of Universities for Research in Astronomy

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## **SUBJECT OF AUDIT**

We were requested by David Willems, NSF IG, on April 29, 2014 to examine Association of Universities for Research in Astronomy's (AURA) Cost Book proposal submitted in response to cooperative agreement AST-0946422 dated September 16, 2013 to determine if the proposed costs are acceptable as a basis for a fair and reasonable price. The \$344,129,000 proposal is for the development and construction of a telescope to monitor the sun. The awardee proposed a performance period of 2010 to 2019. The proposal and related cost and pricing data are the responsibility of the awardee.

## **SCOPE RESTRICTIONS**

Due to the AURA's estimating deficiencies found in this proposal, we were not able to obtain sufficient evidential matter on which to base an opinion on the proposed material, direct labor, and contingency cost portions of the AURA proposal. In summary, AURA did not support the material cost in their proposal using adequate cost or pricing data, they did not use actual costs in the rebaseline of the proposal when actual costs do exist, and they included costs that were explicitly unallowable per the OMB circular regulations. As a result, we were unable to establish an alternative approach for each of the costs elements we attempted to evaluate. Therefore, we do not believe that we can render an opinion on the material, direct labor, and contingency costs in this proposal which represents our scope of audit. While we recognize that the awardee's support is a matter of subject reservations, we also believe that the data provided to us is so significantly flawed that it has caused engagement reservations and therefore renders us unable to perform a GAGAS compliant audit. This precludes us from expressing an opinion on whether the awardee's cost and pricing data are adequate for negotiations.

## **RESULTS OF AUDIT**

Due to the significance of AURA's estimating deficiencies found in this proposal as discussed in the Scope Restrictions section, the scope of our work was not sufficient enough to enable us to express, and we do not express an opinion on whether the awardee's cost book is in all material respects, and therefore, acceptable as a basis for negotiation of a fair and reasonable price as discussed with [REDACTED], Business and Facilities Manager, by Senior Auditor, [REDACTED] on August 11, 2014.

[REDACTED]

## **AWARDEE ORGANIZATION AND SYSTEMS**

### **1. Awardee Organization**

The Association of Universities for Research in Astronomy, Inc. (AURA) is a consortium of universities, and educational and other non-profit institutions, operating several astronomical observatories. AURA members include 32 U.S. institutions and 7 international affiliates. AURA has four operating segments. The Gemini Observatory is an international partnership to operate twin 8.1-meter telescopes on Hawaii's Mauna Kea and Chile's Cerro Pachon. The National Optical Astronomy Observatory (NOAO) operates telescopes located on Kitt Peak in Arizona and Cerro Tololo in Chile. NOAO also provides support for the Gemini Observatory. AURA operates NOAO for the National Science Foundation (NSF) under a cooperative agreement. The National Solar Observatory (NSO) provides observing facilities for use by the nation's solar and solar-terrestrial physics community. NSO conducts research at Sacramento Peak in New Mexico and at Kitt Peak in Arizona for the NSF under a cooperative agreement. The Space Telescope Science Institute (STScI) carries out the scientific mission of the Hubble Space Telescope. In addition, STScI is developing the Science and Operations Center for the James Webb Space Telescope (JWST), the successor to the Hubble. AURA manages STScI under contract with NASA. In 1999 AURA established the AURA Observatory Support Services (AOSS) to provide administrative and logistics support for AURA operations in Chile. AOSS is considered a service center in which its costs go directly to NOAO and NSO; it is not a segment of AURA.

### **2. Accounting System**

AURA/NOAO uses [REDACTED] accounting software by [REDACTED] for not for profit entities. The accounting system is maintained on the accrual basis in accordance with GAAP. The accounting period is October 1 through September 30.

The Advanced Technology Solar Telescope (ATST) cooperative agreement is booked under Project No. Award [REDACTED] ARRA funds and [REDACTED] MREFC funds under the NSO Chart of Accounts and General Ledger Trial Balance Report Account [REDACTED] Award Receivable.

General Ledger journal entries are posted when written; otherwise, the General Ledger is updated at least twice a week after Accounts Payable checks are run. There is a formal monthly close after all the pertinent journal entries are recorded. The month-end closing includes settling interfund accounts between the NSF centers. The General Ledger accounts for the various NSF awards are reconciled in the month following the end of a quarter and at fiscal year-end.

We performed a Preaward survey of AURA's accounting system in audit report 4301-2012B17740010 dated May 31, 2013 to determine if the accounting system is suitably designed, in all material respects, for award of a prospective contract in accordance with the criteria contained in 2 CFR Part 215 (OMB Circular A-110). We have not performed a Post Award Accounting System audit at AURA.

### **3. Estimating System**

We have not reviewed AURA's estimating system and related internal controls.

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**DCAA PERSONNEL**

Telephone No. \_\_\_\_\_

Primary contacts regarding this audit:

[REDACTED]

Other contact regarding this audit report:

[REDACTED]

FAX No. \_\_\_\_\_

DCAA Arizona Branch Office

E-mail Address \_\_\_\_\_

DCAA Arizona Branch Office

[REDACTED]

General information on audit matters is available at <http://www.dcaa.mil/>.

**RELEVANT DATES**

Request Date: April 29, 2014  
Original Due Date: July 25, 2014  
Revised Due Date: August 22, 2014

**AUDIT REPORT AUTHORIZED BY:**

[REDACTED]

Branch Manager  
Arizona Branch Office

[REDACTED]

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**OTHER MATTERS TO BE REPORTED**

Total Cost Book Summary

	ARRA	MREFC	Totals
Contingency	\$ 1,886,166	\$ 44,745,373	\$ 46,631,539
Indirect			
Labor			
Material			
Travel	4,419,567	3,484,040	7,903,606
Total	<u>\$ 146,000,000</u>	<u>\$ 198,129,000</u>	<u>\$ 344,129,000</u>

\* Differences due to rounding

1. Contingency Costs

AURA is proposing \$46,631,539 in costs classified as contingency costs. According to 2 CFR 230 OMB Circular A-122 contingency costs are unallowable.

Contingency Costs

Year	Proposed
2010	\$ -
2011	-
2012	-
2013	2,956,120
2014	12,835,650
2015	7,328,830
2016	2,139,250
2017	3,349,990
2018	9,556,960
2019	8,464,739
Total	<u>\$46,631,539</u>

As noted in the CFR 12.2 cooperative agreements are defined as:

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*"All financial assistance awards and subawards, in the form of grants and cooperative agreements, in accordance with paragraph (b) of this section, are subject to subparts C, D, E, and F of this part, OMB Circulars A-102, "Grants and Cooperative Agreements with State and Local Governments," A-110, "Grants and Other Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations," A-87, "Cost Principles for State and Local Governments," A-21, "Cost Principles for Educational Institutions," A-122, "Cost Principles for Non-Profit Organizations," and A-133, "Audits of States, Local Governments, and Non-Profit Organizations."*

Accordingly, the OMB A-122 Circular provides the definition of contingency cost per 2 CFR 230. This criterion states the following:

*"9. Contingency provisions. Contributions to a contingency reserve or any similar provision made for events the occurrence of which cannot be foretold with certainty as to time, intensity, or with an assurance of their happening, are unallowable..."*

The only exclusions to these contingency costs are self-insurance reserves and reserves for normal severance pay.

OMB Circular A-21 has a similar definition:

*"Contingency provisions. Contributions to a contingency reserve or any similar provision made for events, the occurrence of which cannot be foretold with certainty as to time, intensity, or with an assurance of their happening, are unallowable. (See also Section J.21.c.)"*

According to AURA, their definition for the contingency costs are defined as:

*"the amounts of funds, budget, or time needed above the estimate to reduce the risk of overruns of project objectives to an acceptable level to the organization and stakeholders. Contingency is used to mitigate costs and/or schedule risk."*

They also considered a GAO definition in the GAO -09-3SP of contingency in their argument:

*"Contingency funding is added to the budget estimate to allow for items, conditions, or events for which the state, occurrence or effect is uncertain and experience shows are likely to result in additional costs."*

Additionally when AURA was putting together their cost book, they were instructed by the National Science Foundation (NSF) to use the NSF large facility manual which details the definition and use of contingency reserves. This manual states that contingencies are:

*“...used to control the workflow and adjust WBS budget elements for rate changes and other unknowns, but is never used for additional scope outside of the authorized work scope.”*

AURA is in noncompliance with the OMB Circulars. AURA is developing their cost book using two conflicting regulations. The NSF large facilities manual is instructing them to develop contingency reserves and the OMB circulars state that these costs are unallowable.

What we have discovered is that the NSF large facility manual does not coincide with the overarching regulations of the OMB circulars. These regulations clearly state that contingency reserves are unallowable unless they can tell with time, certainty or assurance that they will happen. Based on AURA's definition there is no certainty or experience to show that any of these events will happen.

### Awardee's Response

We agree with the auditor's assessment that we are compliant with the NSF Large Facilities manual.

The report also notes:

*"These regulations clearly state that contingency reserves are unallowable unless we can tell with time, certainty, or assurance that they will happen."*

We note that the project provided brief descriptions of contingency based on an e-mail request from the auditors. The definitions provided (and quoted in their report) are only a partial description of the contingency definition, development and management within the project; the documents which detail this were provided to the auditors.

- SPEC-█████: Risk Management Plan
- SPEC-█████: Integrated Change Control Plan
- SPEC-█████: Contingency Management Plan

Overall, the contingency funds are expected to be fully spent in the execution of the approved project scope:

“If a project is estimated properly, one hundred percent completion of a project will use one hundred percent of the direct estimate and one hundred percent of contingency” (Section 1.4, SPEC-██████).

As noted, the contingency allows the project to handle **known** uncertainties in the initial project planning. The timing of that impact is based on the ‘trigger’ or encounter dates for those risks as noted in the project risk register. The risks are described by Section 4.1, SPEC-█████:

- a unique identifier



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- a description of the risk and how it will affect the project (this includes identifying the type of risk, e.g., safety, cost, schedule, performance)
- the review status (when the risk was last updated)
- the trigger date or date at which the project expects to encounter (pay off) or avoid that risk
- a probability for the risk
- a cost for the risk
- the expected exposure cost
- owner

Based on this information, the risks are modeled using a Monte Carlo simulation code to evaluate the cost impact of the risks at different levels of probability and a spend profile is developed. This is integrated with the direct budgeting estimates to provide the project's overall budget. The current guidance is to prepare for an 80% probability of success for the spend-out of contingency funds. This is what the project has done.

Overall, although the individual risks have an inherent probability, the pool of risks are statistically certain to be spent to assure the success of the project (at the 80% level); further, the timing for spending contingency funds is also known based on the trigger dates for their occurrence.

Unspent contingency funds are returned to the NSF (Section 7, SPEC-██████████). Unknown risks are handled by the NSF (an example of this is the permitting process delays to the start of the project construction).

**Auditor's Rebuttal**

In the awardee's response, they site SPEC-██████████ Risk Management Plan, SPEC-██████████: Integrated Change Control Plan, and SPEC-██████████: Contingency Management Plan as rationale for estimating using contingency costs. However, the OMB Circulars are the overarching regulations that must be followed. No other guidance can override these regulations. AURA is following the NSF Large Facility Manual, but the manual does not follow the Circulars, which state contingency costs are unallowable, unless it can be told with time, certainty, or assurance that it will happen.

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### 2. Incurred Costs

AST-0946422

Year	Rebaseline/Proposal Amount	A-133 Audit Amount	Mathematical Difference
2010	4,521,376	4,851,106	(329,730)
2011	16,028,674	16,925,846	(897,172)
2012	28,768,532	26,557,835	2,210,697
2013	49,606,896	41,832,130	7,774,766
			<u>8,758,560</u>

\* FY 2013 costs were reduced by the amount shown for contingency costs (\$2,956,120). These costs were shown as unallowable in Note 1 above and have been removed to avoid duplication.

Initially, we asked during the entrance conference if actual costs were included in the new baseline proposal and we were told that this was the case. When we compared the amounts in the proposal to the amounts in the A-133 audits we found that there were significant differences between the two amounts. We asked [REDACTED] Business and Facilities Manager, to explain what was causing these differences as the two amounts should match. He explained to us that the numbers in the cost book were actually budgeted numbers and that they did not include actual expenses. Based on this information we are providing the amounts in the proposal and the amounts in the A-133 audit reports for your use and information.

#### Awardee's Response:

The report notes:

*"Initially, we asked during the entrance conference if actual costs were included in the new baseline proposal and we were told that this was the case. When we compared the amounts in the proposal to the amounts in the A-133 audits, we found that there were significant differences between the two amounts."*

We note that there appears to be a misunderstanding on the Budget vs. Actuals information in the re-baseline cost book:

- The Actuals information is contained within the cost book at the work package level (and is labeled as 'Actuals').
- The numbers in the report table labeled "Rebaseline/Proposal Amount" appear to be the summary Budget numbers (the planned spending profile).
- The Budget numbers were reconciled to the actuals only in July 2012 and at that time were intended to match the actuals.
  - o The reconciliation does not modify historical budget numbers (as these have been used in older reports and so must be retained for transparency). At the time of the reconciliation, an adjustment is made.

- The reconciliation performed in July 2012 did not completely reconcile the Budget and Actuals.
- After July 2012, the Budget and the Actuals will begin to diverge due to the inherent uncertainties in the estimated spending within the project (and latencies in invoicing). By the end of FY12, this difference is \$983,794; this is not surprising based on the changes in the project after July 2012 (e.g., the site permitting was not achieved until November 2012, several months after the planned start and so activities and work that were planned (Budget) did not occur until later and so are absent from the Actuals.
- The 2013 numbers in the report contain no Actuals (this is the 2012 cost book) and only further illustrates the difference between the project spending plan in 2012 and the Actuals incurred in 2013.

We attach a screen shot of the information provided to the auditors illustrating:

- Figure 1: [REDACTED] (actuals in project accounting) and [REDACTED] (actuals in AURA accounting – tied to the A133 audits) are different by \$10,126.66 (due to mischarges corrected after the FY close).

We note that we responded to a question in this area on June 25 and inquired if there were further questions.

### [REDACTED] (COST BOOK 9-15-13)

Sum of Value	Column Labels ▾		
Row Labels ▾	FY2010	FY2011	FY2012
ARRA	\$ 4,721,885.82	\$ 13,915,241.21	\$ 20,220,346.90
MREFC	\$ 200,090.72	\$ 2,991,816.11	\$ 6,367,450.93
<b>Grand Total</b>	<b>\$ 4,921,976.54</b>	<b>\$ 16,907,057.32</b>	<b>\$ 26,587,797.83</b>
	Sum through FY2012 \$ 48,416,831.69		

### [REDACTED] (AURA ACCOUNTING SYSTEM)

Row Labels	FY2010	FY2011	FY2012
ARRA	\$ 4,743,186.34	\$ 13,930,957.05	\$ 20,193,457.20
MREFC	\$ 200,090.72	\$ 2,994,888.90	\$ 6,364,378.14
	<b>\$ 4,943,277.06</b>	<b>\$ 16,925,845.95</b>	<b>\$ 26,557,835.34</b>
	Sum through FY2012 \$ 48,426,958.35		
	Delta \$ 10,126.66		

Figure 1

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### Auditor's Rebuttal:

The A-133 audits that were performed by a third party accounting firm reconcile the incurred cost to AURA's books and records. These costs are audited as the actual costs for this cooperative agreement.

AURA's response above:

"The Budget numbers were reconciled to the actuals only in July 2012 and at that time were intended to match the actuals.

- The reconciliation does not modify historical budget numbers (as these have been used in older reports and so must be retained for transparency). At the time of the reconciliation, an adjustment is made.
- The reconciliation performed in July 2012 did not completely reconcile the Budget and Actuals."

For fiscal years completed at the time of a rebaseline (FYs 2010-2012), no budgetary data will be used in determining the costs as the costs have already been incurred. The cost book was certified as current, accurate, and complete. If budgeted values are being used for completed years with known, audited actuals then the information being proposed is not the most current and accurate information available. The cost book provided to us dated September 16, 2013, shows proposed costs for FYs 2010-2012 totaling \$49,318,581. The A-133 audits for FYs 2010-2012 total \$48,334,787. Neither of these amounts ties back to the screen shots provided by AURA above.

For FY 2013, more current information was available and we calculated the mathematical difference between the proposal and A-133 results. We found significant differences between the estimated and actual costs. We noted the mathematical difference.

We asked for the most current version of the costs by cost element by year to review the updates made for FY 2013 forward and it was not provided.

### 3. Material Evaluation

We had requested [REDACTED] Business and Facilities Manager, to provide us the source documents to support each of the material parts in our sample. Over a period of several weeks, [REDACTED] provided us with the documentation to support the material expenses in the cost book. We found the support was not based on current, accurate and complete cost or pricing data. The majority of the data was based on a subcontractor agreement where AURA developed a payment schedule. The amounts from the payment schedule were the amounts showing up in the material expenses report. According to AURA's support, these amounts were based on milestones or certain percentages to complete. This is not adequate cost support because it's not based on any cost support.

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We also could not tie the majority of the proposed cost back to the supporting documentation. Our analysis found that the majority of the "parts" in the material schedule were not actually material. These were different tasks with an estimated value. We found labor services, travel, and other direct costs which we believe to be improperly accounted for under the material section of the proposal. This can affect the pricing as different rates apply to material vs. ODC cost vs. labor.

In addition there were several requested items in which we never received supporting documentation. These parts are not supported. Based on our evaluation of the material, we do not believe that we can audit these costs per our standards. We have no way to determine a fair and reasonable price. Therefore, we cannot, and did not, opine on the material costs in this proposal.

### Awardee's Response:

We note a number of misunderstandings in the provided report. The report notes:

- a) *"We found the support was not based on current, accurate and complete cost or pricing data."*

We note that the DCAA is evaluating a two-year old cost profile. At the time of its release and review, the pricing quotes and estimates were current and accurate. In addition, subcontractor agreements are signed contracts which commit to the cost to the project. They are the most accurate cost for that development and are the result of a competitive bid process.

- b) *"The majority of the data was based on a subcontractor agreement where AURA arbitrarily developed a payment schedule."*

We recognize that the auditors experience is more strongly aligned with a more traditional contracting process of identifying needed parts, issuing purchase orders for those parts and reviewing the reasonableness of those costs. Our project is, however, a research and development endeavor and many of the components are not commercially off-the-shelf (COTS) items and must therefore be engineered and/or developed. As an example, the primary mirror for the project is not COTS hardware available for purchase. A contract was negotiated to develop the blank (the raw material needed for the mirror) and a further contract was developed to grind and polish the mirror to the required specifications necessary for the project science. Within the contract, the milestone payments are built on developmental stages in reaching the specifications and are tied to the metrology/measurements demonstrating that progress. This demonstrated physical percent complete is tied to the payment schedule and to our earned value system of management. We disagree with the characterization of the methodology used to develop the payment schedule as 'arbitrary'.

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- c) *"Our analysis found that the majority of the "parts" in the material schedule was not actually material. These were different tasks with an estimated value."*

The project has several categories of costs:

- Labor: the project staffing effort in building the DKIST
- Materials: materials and contracts to develop materials in building the DKIST
- Travel: travel by the project staff in building the DKIST
- Indirects: fees associated with the higher level management by AURA

As indicated, contracts to develop necessary components are labeled as 'materials' within the project, and encompass all effort and costs associated with that development. As it is not performed by project staff and ultimately results in a material asset to the project, it is labeled as such. Within the bids, there are more detailed cost break-downs available which detail the costs further (differentiating the vendor's materials, labor, etc.), however, from the project stand-point they are material deliverables.

- d) *"In addition, there were several requested items in which we never received supporting documentation."*

We have documented evidence that we provided all requested information. We also communicated via e-mail on July 17 indicating that we thought we had provided all requested information and to contact us if anything more was required; we received no response.

**Auditor's Rebuttal:**

- a) *"We found the support was not based on current, accurate and complete cost or pricing data."*

*"We note that the DCAA is evaluating a two-year old cost profile. At the time of its release and review, the pricing quotes and estimates were current and accurate. In addition, subcontractor agreements are signed contracts which commit to the cost to the project. They are the most accurate cost for that development and are the result of a competitive bid process."*

During the proposal walk through, we had asked if the rebaseline proposal used the most current, accurate and complete data because we noted that the proposal was already two years old. They told us updated quotes were used in the rebaseline proposal dated September 16, 2013. We did not find this to be the case. We found that the majority of the data in the material section was based on subcontractor agreements which were outdated.

- b) *"The majority of the data was based on a subcontractor agreement where AURA arbitrarily developed a payment schedule."*

We recognize that the auditors experience is more strongly aligned with a more traditional contracting process of identifying needed parts, issuing purchase orders for those parts and reviewing the reasonableness of those costs. Our project is, however, a research and development endeavor and many of the components are not commercially off-the-shelf (COTS) items and must therefore be engineered and/or developed. As an example, the primary mirror for the project is not COTS hardware available for purchase. A contract was negotiated to develop the blank (the raw material needed for the mirror) and a further contract was developed to grind and polish the mirror to the required specifications necessary for the project science. Within the contract, the milestone payments are built on developmental stages in reaching the specifications and are tied to the metrology/measurements demonstrating that progress. This demonstrated physical percent complete is tied to the payment schedule and to our earned value system of management. We disagree with the characterization of the methodology used to develop the payment schedule as 'arbitrary'.

If these milestone payments were part of the subcontract agreement, the agreement should have detailed the payment schedule, which was not in the agreement. This made tying any of the costs back to source documentation impossible. It also made it very hard to determine the reasonableness of the costs. Based on the lack of detailed information, we were unable to, and did not, render an opinion on the evaluation.

c. *"The project has several categories of costs:*

- *Labor: the project staffing effort in building the DKIST*
- *Materials: materials and contracts to develop materials in building the DKIST*
- *Travel: travel by the project staff in building the DKIST*
- *Indirects: fees associated with the higher level management by AURA*

*As indicated, contracts to develop necessary components are labeled as 'materials' within the project, and encompass all effort and costs associated with that development. As it is not performed by project staff and ultimately results in a material asset to the project, it is labeled as such. Within the bids, there are more detailed cost break-downs available which detail the costs further (differentiating the vendor's materials, labor, etc.), however, from the project stand-point they are material deliverables."*

While we do agree that there are several categories of costs, we do not believe that these costs are properly classified. The majority of the material costs is actually made up of subcontractor costs for tasks such as labor and travel. While these costs may be outsourced to a third party, they are not material items.

d. *We have documented evidence that we provided all requested information. We also communicated via e-mail on July 17 indicating that we thought we had provided all requested information and to contact us if anything more was required; we received no response.*

By July 17, 2014, we had already ended our field work as the awardee was not responsive to our requests for information and did not provide us support for the material items in a timely

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manner. We requested a 2-3 day turnaround, which did not occur. Our initial request stated that we needed all information to support the costs for the sampled items. The requested data also included the cost price analysis to demonstrate cost reasonableness, which is a requirement of both AURA's policies and procedures along with OMB Circular 2 CFR 215.45. These analyses were never provided. There were additional items from our sample in which we received no supporting information. These items remain were not supported.