

PUBLIC COMMENTS ON NSF MAJOR FACILITIES GUIDE (MFG) DRAFT, DECEMBER 2018 & NSF FINANCIAL DATA COLLECTION TOOL WITH NSF RESPONSES

Each comment is addressed with one of the following NSF Responses

- Addressed in this version with an explanation of how the comment was addressed
- No change with an explanation of why
- Will be assessed and addressed in later version

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Cmt #	Sec Para, page no.	Source	MFG Language/Observation	Comment	NSF Response/Resolution
1.	General	AUI-NRAO (Beasley)		<p>Who is the audience for this document now? If it is meant to be project proponents – ok, it does a lot of that, but also has long sections on the way NSF is governing MREFC, how NSF is doing its internal processes, etc. It is good knowing that stuff, but it increases the bulk of the document and therefore the challenges to efficiently extract information from it.</p> <p>This document may be too long now ... there's a lot of great stuff, but it's not easy to read or navigate. There are long detailed sections in there (like Risk management) that probably would be better off in their own documents, and merely summarized here? The LFM used to be about policy and summaries of processes, now it seems to be leaning towards recording the processes, which is making it unwieldy?</p>	<p>No change.</p> <p>The audience is both internal and external. The Guide is intended to summarize internal workings at a high level, so Recipients understand the process. NSF has several internal process documents that the community does not see.</p> <p>NSF has equal concerns about it growing in size and intend to pare down some sections as we enhance others. We may bring in a professional editor as part of a future revision to help with the organization and areas of duplication.</p>
2.	General	AUI-NRAO		<p>Preference: real page numbers vs section-specific numbers (which can get deep and long)</p>	<p>No change.</p> <p>With the size of the Guide and alignment of content type to Sections and Sub-sections, we find the use of the section number in the page number to be more helpful than confusing.</p>
3.	General	Woods Hole-OOI		<p>There are multiple instances of "Large Facility," "LFOs," "HLFO," and "Large Facilities" throughout the document, including the header, 2.1.6-15 through -18, 2.1.6, 4.6.2-2, 2.1.4-5, 2.1.6-1 through -3, and page 8-2. I believe the intention was to change these instances to align with new terminology "Major Facility."</p>	<p>Accepted.</p> <p>Yes, the intention was to change "Large Facility" to "Major Facility" throughout the document except the organizational name of the Large Facilities Office (LFO) has <u>not</u> changed and remains in the Guide as LFO and Head of the LFO (HLFO). A word search was conducted, and associated edits were made.</p>

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4.	General	Trusted CI		<p>The purpose of our detailed comments and suggested changes or additions is to aid in usability and readability, as well as alignment with Trusted CI's guidance to the community.</p> <p>Suggested change: Replace "information security" with "cybersecurity" throughout or define them as being equivalent terms.</p> <p>Discussion: Cybersecurity and information security - both used but not explicitly described as equivalent.</p> <p>Justification: Clarity and consistency</p>	<p>No change.</p> <p>"Information Security" and "Cybersecurity" are defined as equivalent terms in Footnote 3 on page 6.3.2-1 which states "For the purposes of this section, there is no distinction among the terms "information security," "cybersecurity," and "IT security" as referenced in the award terms and conditions. However, this section specifically addresses digital information."</p>
5.	General	Trusted CI		<p>Throughout the document: Suggested change: Add page numbers to the document</p> <p>Discussion: The lack of page numbers makes referencing or communicating about the text in the document more difficult.</p> <p>Justification: Improve ease of communication about parts of the text.</p>	<p>No change.</p> <p>There are page numbers. It is the sub-section number and then consecutive page number. For example, pages 6.3.3-1 and 6.3.3-2 discuss Governance under Section 6.3 Guidelines for Cyber-Security of NSF's Major Facilities.</p>
6.	General	BOAC Subcommittee		<p>NSF initiate a dialogue with the recipient community in preparation for the establishment of a set of core competency recommendations for recipient staff who support the administrative and management aspects of large facilities projects.</p>	<p>Accepted and will be addressed in later version.</p> <p>This will be codified as part of an interim update to the MFG by adding a new section on "Key Personnel".</p>
7.	General	NSF BFA-DGA		<p>"Grant/Agreement Officer" should be "Grants and Agreements Officer"</p> <p>"Contract Officer" & "Contracts Officer" should be "Contracting Officer"</p>	<p>Accepted.</p> <p>Changed throughout the document.</p>

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8.	General	NSF BFA-DGA		References to “Federal grant” should be “Federal award” and the “the applicable award terms and conditions”; “assistance agreement” should be “assistance award”; “government funds” should be “Federal funds”; “cooperative service agreement” should be “cooperative support agreement”	Accepted.
9.	1.1, 1.1-1	AUI- NRAO	“NSF makes awards to external Recipients that include nonprofit organizations and universities to undertake construction, management, and operation of facilities. Such awards frequently take the form of cooperative agreements but may also be made in the form of contracts. The reasons underlying the selection of the cooperative agreement as the appropriate funding mechanism are: ...”	The Guide says cooperative agreements are “the appropriate” approach, which seems to imply contracts aren’t ... but you admit you do have contracts. “an appropriate funding mechanism” better?	Accepted. The language was revised for clarification - cooperative agreements are the preferred award instrument. The reasons for selection of cooperative agreement are given in the bullets on page 1.1-1. If these conditions are not present, then a contract may be appropriate.
10.	1.1, 1.1-1	AUI- NRAO	“NSF makes awards to external Recipients that include nonprofit organizations and universities to undertake construction, management, and operation of facilities.”	MFG talks about NSF using CAs with a range of organizations, but you don’t list “for profit” orgs... omission? (polar: Lockheed martin)	Accepted. Awards can be made to “for profit” organizations as indicated later in the Guide. Sentence was edited to include “private sector”.
11.	1.1, 1.1-2	AUI- NRAO	“The cooperate agreements also affords flexibility to tailor project-specific requirements and performance metrics.”	“affords” should be “afford”	Accepted. Removed “The” and changed “affords” to “afford”.
12.	1.1, 1.1-2	NSF BFA-DGA	“The cooperate agreements also affords ...”	“cooperate agreements” should be “cooperative agreement”	Accepted.

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13.	1.1, 1.1-2	AUI-NRAO	"The Major Facilities Guide (MFG) contains NSF policy on the planning and management of major facilities. The purpose of the Guide is to: ..."	Seems like the guide talks about more than just "planning and management"... initiation, planning, evaluation, execution, performance monitoring, lifecycle, etc.	Accepted. Added the words "through their full life cycle" after "major facilities" to indicate from initiation through execution to the end of the life cycle (divestment).
14.	1.1, 1.1-2	AUI-NRAO	"...required policies and procedures as well as pertinent guidance and practices at each stage of a facility's life cycle."	Sentence uses the phrase "life cycle", but not clearly defined	Accepted. A footnote was added listing each life cycle stage and referencing Section 2 of the Guide for a description of each stage.
15.	1.1, 1.1-3	AUI-NRAO	"The R&RA account is used to support other activities involving a major facility that the MREFC Account cannot support, including planning and development, design, operations and maintenance, and scientific research."	This sentence kind of defines life cycle here... move up?	No change. A footnote was added to define life cycle.
16.	1.1, 1.1-3	AUI-NRAO	"Facilities and infrastructure projects constructed or acquired with funds from the R&RA (and/or leveraged with EHR Accounts) with a total project cost (TPC) greater than \$100 million or that require National Science Board (NSB) authorization; whichever is less."	Refers to the National Science Board – is that body defined somewhere? (overall question – are the committees/boards/departments/individuals involved all named somewhere?)	No change. Section 2.1.6 describes the organizations and individuals with responsibilities associated with oversight of NSF Major Facilities.
17.	1.1, 1.1-3	AUI-NRAO	"Facilities and infrastructure projects constructed or acquired with funds from the R&RA (and/or leveraged with EHR Accounts) with a total project cost (TPC) greater than \$100 million or that require National Science Board (NSB) authorization; whichever is less."	\$100M before some external constraints added? Seems a bit high to me. And there are \$25M projects with horrible externalities (international partnerships) where some monitoring might be relevant. I know this won't be a popular opinion here, but defining the threshold purely by cost, and setting that number so high, seems... brave. Conversely, too much process on small projects is annoying and wasteful.	Accepted. A reference to Section 5 Guidance for Mid-Scale Research Infrastructure Project of the Guide was added to this section. The policies in this Guide are tailored for mid-scale projects. Section 1.4.4 defined mid-scale projects.

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18.	1.1, 1.1-3	AUI-NRAO	"If, on a case-by-case basis, departures from the policies in this Guide are considered necessary or prudent, the Recipient must provide a written justification and discuss proposed deviations with the Program Officer, LFO Liaison, and Grants/Agreements Officer or Contracting Officer as early as possible."	LFO acronym used ... defined?	Accepted. Revised to "Large Facilities Office (LFO) Liaison"
19.	1.2, 1.2-1	AUI-NRAO	"The MFG requirements flow from other NSF policies and statutory requirements. The hierarchy of documentation, in order of precedence, is as follows: ..."	hierarchy of documentation ... wouldn't there be some higher docs? NSF organic act, NSF mission/charter, NSF strategic plan, ??	No change. Impact of NSF's Organic Act on major facilities is given in Section 1.1. The MFG has no requirements that flow down from this Act.
20.	1.2, 1.2-1	AUI-NRAO	"All facilities projects require merit review, programmatic/technical review, and a substantial approval process. This level of review and approval differs substantially from standard grants, as does the level of oversight needed to ensure appropriate and proper accountability for federal funds. The policies, requirements, recommended procedures, and best practices presented herein apply to any facility large enough to require interaction with the NSB or any facility so designated by the Director, the Deputy Director, or the Assistant Director/Office Head of the Originating Organization(s). ³	"merit review, programmatic/technical review, substantial ... all jargon?"	No change. Footnote 3 states "See Section 2.1.6 for definition of this and other key terms. ... <u>Readers not familiar with NSF and its processes should review this material before proceeding.</u> "

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21.	1.2, 1.2-2	AUI- NRAO	“Program Officers (PO) are encouraged and expected to continue to identify and adopt best practices aimed at improving NSF oversight and Recipient management of major facilities projects ...”	Asks POs for feedback, don’t tell them how to deliver it ... “please direct your comments to XXX”	Accepted. Added a reference to NSF Knowledge Management program which identifies the process for updating policies and procedures, such as this Guide.
22.	1.3, 1.3-1	AUI- NRAO	“Section 3 describes the requirements for preparing and following the various detailed management plans required during the life cycle of a major facility including Recipient’s plans and guidance for NSF’s Internal Management Plans (IMPs).”	Para 1 third bullet, comma missing after facility	Accepted.
23.	1.4.1, 1.4-1	AUI- NRAO	“Major Facilities and mid-scale projects are subsets of research infrastructure.”	Why is “Major Facilities” both capitalized?	Accepted. Associated edits were made throughout the guide.
24.	1.4.2, 1.4-1	AUI- NRAO	“NSF Director Memo NSB-2016-46 to the National Science Board dated October 20, 2016 informed the Board of the Director’s decision to reduce the Total Project Cost (TPC) threshold for MREFC account eligibility to \$70 million. This modification to the previous threshold of 10% of a Directorate’s or Office’s Current Plan was intended to enable innovative infrastructure projects.”	Remove history lesson, just state current limits at time of document freeze?	No change. These references help maintain the historical record for NSF.
25.	1.4.3, 1.4-1	AUI- NRAO	“Per Section 110 of the 2017 American Innovation and Competitiveness Act (AICA), a major multi-user research facility ...”	Remove history lesson, just state current limits at time of document freeze?	No change. These references help maintain the historical record for NSF.

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26.	1.4.3 & 1.4.4, 1.4-1	AUI-NRAO	“Per Section 109 of AICA, a mid-scale project means research instrumentation, equipment, and upgrades to major research facilities or other research infrastructure investments that exceeds the maximum funded by the Major Research Instrumentation program (MRI) and are below that of a major multi-user research facility project.”	Guide makes this distinction about “multi-user”. Is that real? generally big facilities are for multiple science goals, but so are some of the midscale facilities (in fact, they go out of their way to find additional uses for their data). the “multi-user” definition is a correlation, not causal?	Accepted. A clarification has been added. Multi-user is a congressional term. The Guide intentionally shortens to simply “major facility”.
27.	1.4.5, 1.4-2	AUI-NRAO	“NSB statement 2015-45 and resolution 2015-46 address recompetition of major facilities. The NSB issued a statement that the question of whether to recompete or not should be assessed at the time of every potential renewal.”	Recomp thing non sequiter ? And is an award issue, not a facilities issue. this text seemed lost here.	No change. This language is included in this Section <i>Applicable Legislation and NSF Policy</i> because it is policy set by the NSB regarding competition, renewal, and divestment of major facilities.
28.	2.1.2, 2.1.2-1	AUI-NRAO		Ahem.. 7 character page number ☹)	No change. With the size of the Guide and alignment of content type to Sections and Sub-sections, we find the use of the section number in the page number to be more helpful than confusing.
29.	2.1.2, 2.1.2-1	AUI-NRAO	“To be eligible for consideration for MREFC funding, each candidate project should represent ...” “In addition, a candidate project should...”	In para 1 and 2, it talks about projects, do you mean facilities?	No change. Section 2.1.1 defines MREFC funding is specifically for the construction of major science and engineering infrastructure. The use of “Project” refers to the Construction Stage which has a defined start and end.

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30.	2.1.3, 2.1.3-2	NSF BFA-LFO		The process to exit from Development Stage to transition to Design Stage is a recommendation from the CORF to the Director based on a strategic review and NSF Director approval.	Accepted.
31.	2.1.3, 2.1.3-3	NSF BFA-LFO		For projects with other funding for development and design, can enter at CDR or PDR based on technical readiness and strategic review by the CORF.	Accepted.
32.	2.1.3, 2.1.3-4	AUI-NRAO	“The Concept of Operations Plan (including robust operations and maintenance cost estimates and agreements between parties for funding, data sharing, etc.) should be in place in preparation for entering this stage.	In para 2 – At the Operations Stage, it talks about the Concept of Operations doc being in place – suggest at this point, detailed operation plans and a full suite of maintenance / development plans should be in place.	Accepted. Agree the that Concept of Operation Plan that is initiated during the Design Stage should be finalized prior to start of Operations. The language has been revised to clarify.
33.	2.1.3, 2.1.3-5	AUI-NRAO	“It is recommended that the Sponsoring Directorate develop a plan that follows NSF policy on divestment decisions...”	“Sponsoring Directorate” defined?	Accepted. The guide used “Sponsoring Directorate” and “Originating Organization” interchangeable. The guide has been revised to use “Sponsoring Organization” which is defined in Section 2.1.6.1.
34.	2.1.4, 2.1.4-1	AUI-NRAO	“Following successful research and development by scientists and engineers in an educational institution, the entire project may then be further designed and constructed by an award made directly to a competent managing organization, including industry.”	Here you seem to suggest for-profits can be involved. (see comment above).	No change. Awards can be made the private sector. Section 1.1 was revised in response to comment above.
35.	2.1.5, 2.1.5-1	AUI-NRAO	This section, to be written, will illustrate when various preconstruction planning activities ...”	TBD	No change. Comment is an observation. This Section is planned to be addressed in a future version of this Guide.

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36.	2.1.6	AUI-NRAO (Beasley)		The section of how LFO, CORF, senior NSF layers interact with projects – was somewhat difficult to understand. The landscape IS difficult to understand, I know. I wonder if this material would be better as highly summarized here, more detail in some supporting doc?	Will be assessed and addressed in later version. We may bring in a professional editor as part of a future revision to help with the organization and areas of duplication.
37.	2.1.6, 2.1.6-1 through 2.1.6-22	NSF BFA-DGA		DGA is not involved with major facility awards. CSB is responsible for cooperative agreement awards for the Major Facilities. Recommend references to DGA be removed from the MFG.	Accepted. Section 5 of the MFG provides guidance for mid-scale projects which are funded through both DGA & CSB. References to DGA were retained but clarifications were added. Titles of figures were revised to include “mid-scale research infrastructure”. DGA was removed from Figure 2.1.6-4 since IPTs are not associated with mid-scale projects. On page 2.1.6-12, changes to “The G/AO is administratively part of DACS in BFA, except for mid-scale projects where they may be part of DGA (See Section 5 of this Guide).”
38.	2.1.6.1, 2.1.6-4	AUI-NRAO (Beasley)	“NSB – Establishes policy, reviews and authorizes MREFC Account budgets, and reviews and authorized specific MREFC projects for funding.”	Here those definitions of stakeholders... could reference earlier ... (NSB defined?)	No change. Footnote 3 on page 1.2-1 references this Section for descriptions of the NSF organizations and officers.
39.	2.1.6.1, 2.1.6-4	AUI-NRAO	“Figure 2.1.6-3 NSF organization chart showing policy and approval bodies for major facilities.”	All these panels and boards are confusing. It looks like you’ve got multiple threads of governance and responsibility, and I appreciate the effort to map it out in some non-conflicting way, but.... (understand, this may be where we are at present, but I’m pretty sure if I provided you a project org chart like this, you’d want it thinned/trimmed).	Accepted. Figures 2.1.4-1 and 2.1.4-2 provide a mapping of the Panels and Boards to the major facility life cycle stages and NSF oversight responsibilities. A footnote was added here to refer to these figures.
40.	2.1.6.1, 2.1.6-8	NSF BFA-DACS		Table 2.1.6-1: Change “Cost Proposal Review Document (CPRD)” to “Decision Memo” to align with internal terminology.	Accepted.

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41.	2.1.6.2, 2.1.6-15 Figure 2.1.6-4, 2.1.6-18	AUI- NRAO	<p>“The CORF advises the NSF Director on all aspects of NSF major and mid-scale facilities throughout their life-cycle and collaborates with all at NSF who are involved in oversight and assistance for the NSF research facilities portfolio.”</p> <p>“The LFO has the institutional authority and resources to effectively develop mandatory policies, practices and procedures, which are approved by senior management, for all stages of the facility life-cycle.”</p>	<p>The oddness of multiple threads of governance and responsibility is further reinforced where the CORF and Head, LFO roles defined. I know some of the history here, so don't mean to bug you, but the lack of connection between these two roles is odd. Shouldn't – LFO report to CORF, not BFA?</p> <p>Diagram 2.1.6-18 – indicates the rich complexity.</p>	<p>No change.</p> <p>The LFO deals with business-related policy, process, and procedures for oversight of major facilities and is properly located in BFA reporting to the CFO. Where the CORF deals with strategy issues and is located in the Office of the Director. See Figure 2.1.6-1 for a graphic of these relationships.</p>
42.	2.3.3.2, 2.3.3-2	NSF BFA-LFO	<p>“Due to the Federal appropriations process, there may be one or more years between the PDR and the start of construction, which is predicated on successful completion of the FDR. During this time the NSF will review the project at least annually to ensure that the total project cost and basis of estimate (BOE), acquisition strategies, schedule, and risk management plan presented at the PDR are still valid.”</p>	Delete paragraph.	Accepted.

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43.	2.3.3.2, 2.3.3-3	NSF BFA-LFO	NSF has implemented a “no cost overrun policy” on major facility construction projects. This policy requires that the Total Project Cost (TPC) estimate developed at the Preliminary Design Stage has adequate contingency to cover all foreseeable risks, and that any cost increases not covered by contingency be accommodated by reductions in scope.	Delete paragraph. The no-cost overrun policy is applicable to the post FDR TPC negotiated for award.	Accepted.
44.	2.4.2.1, 2.4.2-1	AUI-NRAO	“As part of the annual construction review process outlined above in section 2.4.1 Construction Award Management and Oversight, at an appropriate time approaching or following construction completion, NSF will conduct a final construction review. This review is intended to assess the extent to which the required scope was delivered in accordance with the PEP and award terms and conditions.”	Close out review – is this an internal (NSF only) or external review?	No change. The close-out review is organized by NSF and comprised of panelists external to NSF.
45.	2.4.2.2, 2.4.2-1	NSF BFA-DGA	“Per the PAPPG, the Recipient may authorize a one-time extension of the end date of a cooperative agreement of up to 12 months. The Recipient should discuss such an extension with the Program Officer (PO).”	The section about NCE’s is incorrect. Grantee approved NCEs are only for grants. In accordance with the NSF CA FATCs, grantee-approved extensions are NOT applicable to cooperative agreements.	Accepted. Sentence was deleted, and language revised to state the PO recommends approval of the first NCE.

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46.	2.4.2.2, 2.4.2-3	AUI-NRAO		The descriptions through this whole section about transitions to Ops were a bit simplistic. In reality, there are profound interactions between construction and operations, with potential costs/damages going both ways depending on what happens, complexity about ownership of equipment (owned by construction, ops?) etc. Seems like between “construction” section and “ops” section there should be more discussion of several vexing transition issues.	No change. There are indeed many possible scenarios that may arise during the transition from construction to operations. The period leading up to the close-out review is an opportune time to identify and discuss these types of issues. Adding these issues to the charge to the review panel creates an occasion for an external and unaligned group of experts to offer recommendations on resolution.
47.	2.5.1, 2.5.1-3	AUI-NRAO	“It is the Recipient’s responsibility to manage and maintain the NSF-funded facilities, equipment, and instrumentation used in the conduct research. However, <u>NSF rarely maintains ownership</u> to major research equipment and facilities it funds.”	I disagree. NSF are the owners, it may be the title of things is in the mgt org hands, but if they lose recompetition, they are obliged to sign the equipment to new mgt org. May need some finesse in this description.	Accepted. Section 2.5.1 and Section 6.6 were revised to clarify it is the Recipient’s responsibility to maintain the NSF-funded facilities and NSF ownership is specified in the terms and conditions of the award and NSF may choose to invoke it contingent interest to take title or transfer to another organization.
48.	2.5.1, 2.5.1-4	AUI-NRAO	“In most cases, NSF will annually conduct Operations Reviews of its major multi-user research facilities, utilizing an external panel of experts...”	Guide references Annual Operations Reviews ... we call them Program Operating Plan reviews...	Accepted. The operations review referenced here is not a formally defined term. To reflect this concept “operations review” is not capitalized throughout the document. Reviews with similar objectives may have different names.
49.	2.5.1, 2.5.1-3	Woods Hole-OOI	The Annual Work Plan (AWP) describes what the facility expects to accomplish in the coming fiscal year. <i>For many facilities, the AWP, annual operations proposal, and Cost Estimating Plan (per Sections 4.2.2 and 4.2.4) can be combined as one document, so long as all elements are addressed.</i>	Not a comment for the draft, but I would be interested in seeing a sample document for the layout and appendices that accomplishes this.	No change. Responded directly to commenter.

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50.	2.5.1, 2.5.1-3	Woods Hole-OOI	The Annual Report describes in detail the activities of the facility in the previous twelve months. This report is required by NSF policy and necessary to review progress on that year's performance goals as described in the AWP.	It would be helpful to have definitive clarification of what should be included in the "Annual" report timeframe. This document mentions the "previous twelve months" and the "year's goals described as in the AWP." However, in reality, the Annual report is due 90 days before the end of the AWP POP, so the "Annual" Report either covers 12 months of two different project years (3 months of the prior year and 9 months of the current report year) or just the 9 months of the current report year. Neither of which quite fit the statement in the Major Facilities Guide. Different directorates, even different POs within the same directorate, are inconsistent in their interpretation of the how the annual report timeframe is applied.	Accepted. Language has been revised to clarify that the period for the Annual Report is based on the award date and award terms and conditions.
51.	2.6, 2.6-1	AUI-NRAO	"While not part of the annual budgeting process, proposals may be requested to address partial or full divestment of the facility following the award period, including property divestment, decommissioning, and disposition costs and other costs related to employee separations."	Do you want to mention that typically it is considered that decommissioning costs for a facility are about the same as 2-3 years of ops costs? (I don't know where this rule came from, and I can think of horrible exceptions e.g. AO, but giving some sense of scale might be considered).	No change. It is more appropriate for a review body to assess or advise on the cost estimate range based on each facility's situation and divestment plan. This guide will apply to a wide range of facilities and projects with very different research focuses. Setting a range that can be applied to all may not be realistic and could lead to more difficulties and controversial.
52.	3.2, 3.2-1	AUI-NRAO	"NSF FACILITY PLAN [RESERVED]"	TBD	No change. Comment is an observation.
53.	3.3, 3.3-1	AUI-NRAO	"NSF OVERSIGHT MANAGEMENT PLANS FOR THE MAJOR FACILITY LIFE CYCLE"	title is "NSF Oversight Management Plans" should be "NSF Internal Management Plans" ?	Accepted.

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54.	3.4.1, 3.4.1-1	AUI-NRAO	Table 3.4.1-1 List of the Typical Components of a Project Execution Plan, with Sub-Topics and Descriptions	Table should include any special construction requirements, closeout requirements?	Accepted. The second paragraph on page 3.4.1-1 was added to address special construction requirements. The Table currently has component 16.1 Project Close-out Plan to document the closeout requirements.
55.	3.4.1, 3.4.1-1	AUI-NRAO	Table 3.4.1-1 List of the Typical Components of a Project Execution Plan, with Sub-Topics and Descriptions	Important for PEP to document all assumptions and boundary conditions driving project design and implementation. (didn't hear that clearly...)	Accepted. Added language to this section.
56.	3.4.1, 3.4.1-1 through 3.4.1-6	AUI-NRAO	Table 3.4.1-1 List of the Typical Components of a Project Execution Plan, with Sub-Topics and Descriptions	Table 3.4.1-1 is kinda long, really breaks up the document. Put in as an appendix (like previous LFM's?).	Will be assessed and addressed in a later version.
57.	3.4.1, 3.4.1-1	AUI-NRAO	Table 3.4.1-1 List of the Typical Components of a Project Execution Plan, with Sub-Topics and Descriptions	Missing from Table 3.4.1-1 – A Construction to Operations Transition Plan?	No change. The administrative process for transition to operations is addressed in Component 15.2. The technical aspects are addressed in Component 15.1. These components could be in one or more plans as needed by the specific project.
58.	3.4.1,	BOAC Subcommittee	Table 3.4.1 PEP components: Section 1.2 (Scientific Requirements), Section 4.1 (Project Definition) and Section 4.4 (Scope Management Plan).	Threshold or Non-negotiable science and or technical performance requirements should be traceable. There should be more clearly defined criteria around scoping/de-scoping decisions. Threshold or Non-negotiable requirements are the level of requirements below which the project isn't worth doing.	No change. NSF will develop internal guidance for major facility reviews to ensure that scoping/descoping criteria and the impact of descoping decisions on the threshold requirements be carefully evaluated.
59.	3.4.2, 3.4.2-1 – 3.4.2-3	AUI-NRAO		TBD	No change. Comment is an observation.

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60.	3.4.2.15, 3.4.2-2	AUI-NRAO	"The Operational Readiness Plan defines the process for acceptance at the end of construction and determining operational readiness."	Para 4 - Operational Readiness Review ... this gets back to the point raised above... sometimes you're already in operations while still in construction? Might be good to check that your callouts here (like this review) make sense in these complex C->O transitions. Could be "Science Operations Readiness Review".	No change. The MFG language is referring to a "Plan" not a "Review". The Guide states: "Transition from construction to operations could be a <u>single</u> acceptance event <u>or multiple</u> depending on the nature of the project." "At least one year prior to initial commissioning activities, the plans must be updated and provided to NSF for review." "Once the commissioning planning is complete, an operations readiness review <u>may be held</u> to examine and comment on the plan."
61.	3.4.2.15, 3.4.2-3	AUI-NRAO	A Concept of Operations Plan (PEP-15.3) is also required by the PEP, whereby the hand-off from construction project responsibility and funding to operations responsibility and funding is detailed.	Having only concept of operations doc at this stage seems too little too late.	Accepted. Language revised to clarify that the Concept of Operations Plan is refined during the Construction Stage in preparation for the Operations Stage.
62.	3.5.2, 3.5.2-1	AUI-NRAO	"Federally Funded Research and Development Centers (FFRDCs) follow a slightly different process and cannot be renewed or divested until a comprehensive review is performed.	Discussion of FFRDC complexities. Don't think FFRDC's are defined anywhere in this doc. Guide talks about a "comprehensive review"; aren't they all?	Accepted. Language revised to clarify FFRDC follow a different process as outlined in the Federal Acquisition Regulation (FAR).

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63.	4.2.1, 4.2.1-1 through 4.2.1-4	BOAC Subcommittee	4.2.1 Overview of Guidance and Process for Both Construction and Operations Awards	<p>The methodology used for estimating purposes should be listed in this order of preference: 1) Actual/historical data for the system/subsystems being estimated; 2) Analogous data with adjustments to reflect the technical and complexity differences; 3) Parametric data should be used for higher level WBS - modified to reflect the technical, size, weight, quantity and/or schedule of the system being estimated; 4) Expert opinion - used only if a secondary methodology is used to substantiate the expert opinion provided by the recipient or evaluator.</p>	<p>Accepted.</p> <p>Partially accepted. A different order of estimating method preferences is not currently provided anywhere in Section 4.2. Section 4.2.2.1 and 4.2.3.4 have the following, in order of increasing maturity “(e.g., expert opinion, analogy, parametric, engineering build-up, historical data)”. 4.2.3.4 also discusses expected evolution of estimate through design phases.</p> <p>Agree preferences might be helpful. However, Analogous is considered top-down and is less accurate than parametric. Also, Section 4.2 applies to construction and operations, so the focus is not solely on systems being estimated.</p> <p>Added a statement to 4.2.2.3 on GAO best practice #6 Obtain data that: “The best estimating method should be chosen for each WBS element. The following cost estimating methodologies should be used, in order of preference, if the data exists: (1) Actual/historical data for the systems or operations being estimated; (2) Detailed engineering build-up; (3) Parametric data with adjustments to reflect differences (e.g., technical, size, weight, quantity, location, schedule); (4) Analogous data with adjustments to reflect differences; (5) Expert opinion, only if a secondary methodology is used to substantiate.” 4.2.2.3 currently states that an explanation for choosing a particular estimating method should be documented in the CEP and Cost Book.</p>
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64.	4.2.1 and 4.2.2, 4.2.1-1 through 4.2.2-17	BOAC Subcommittee	4.2.1 Overview of Guidance and Process for Both Construction and Operations Awards and 4.2.2 Elements of Both Construction and Operations Estimates	Improve cost estimate documentation. Both the Recipients and evaluators should clearly document the estimate approach, quantitative justification and support.	No change. Section 4.2 describes how estimate shall be documented. GAO considered this best practice of documenting the estimate to be "fully met".
65.	4.2.2.1 & Figure 4.2.2-1, 4.2.2-2 and 4.2.2-3	NSF CISE	Figure 4.2.2-1 Sample Project Management Control Systems Relationship Diagram	It is unclear as to what guidance applies to the operations stage. In many places, it seems that the operations phase is being treated the same way as a construction project in terms of budget, risk management, and projects controls requirements. A case in point is Figure 4.2.2-1 which is contained within section 4.2.2 Elements of Both Construction and Operations: The figure has boxes for integrated master schedule, EVM, Schedule reports etc. that should apply just to construction projects	Accepted. Figure 4.2.2-1 was revised to add clarifications as to what is applicable to operations versus construction. CEP, WBS, Cost Model Data Set and Cost Reports are elements of both construction and operations estimates. The other elements are applicable to construction and major facility upgrades.
66.	4.2.2.3, 4.2.2-6 thru 4.2.2-9	Woods Hole-OOI	Application of GAO Cost Guidance to Major Facilities.	The addition of this section is helpful by summarizing each of the 12 GAO steps and providing some interpretation, insight, and suggested approaches as to how the steps might be applied to the MF.	No change. Comment is an observation and no response required.
67.	4.2.2.4	Woods Hole-OOI	"To assist Recipients in determining the difference between a subaward and a contract, please refer to the "Subrecipient vs. Contractor Checklist," developed by the Association of Government Accountants."	Inclusion of the Subrecipient vs. Contractor checklist is useful. This is an area that often raises questions.	No change. Comment is an observation and no response required.
68.	4.2.2.5, 4.2.2-15	AUI-NRAO	"The payment of fee may be authorized for major facility construction and operations awards, unless otherwise prohibited in specific circumstances by NSF. ..."	Would it be useful to open this section with an explanation of the uses/philosophy behind Fee?	Will be assessed and addressed in later version.

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69.	4.2.2.5, 4.2.2-15	AUI- NRAO	"The amount of fee will not exceed the statutory limitations pertaining to cost contracts set forth at 41 U.S.C. 3905, notwithstanding that the fee is provided through a cooperative agreement."	In the middle, the text refers to "cost contracts", what is relevance for CA/CSAs?	No change. This is the name used in the U.S. Code to describe the percentage amount NSF will not exceed. NSF has determined to use code for Cooperative Agreements and Cooperative Support Agreements.
70.	4.2.2.5, 4.2.2-15	NSF BFA- DACS		In the FEE paragraph, change "Cost Proposal Review Document (CPRD)" to "Decision Memo" to align with internal terminology.	Accepted.
71.	4.2.2.6, 4.2.2-16	AUI- NRAO	"Recipients are not limited to using the publicly available economic assumptions and broad OMB inflators (https://www.whitehouse.gov/omb/budget/Supplemental) when doing cost estimates."	OMB inflators ... why isn't LFO delivering each year for all projects?	Accepted. The information on OMB inflators was removed since the practice of NSF providing them for all projects is no longer followed or necessary. OMB and the Congressional Budget Office provide publicly available economic assumptions. Specialized escalation data may also be more helpful for a particular facility.
72.	4.2.3.4, 4.2.3-7	AUI- NRAO	Figure 4.2.3-2 Construction Cost Book Sheet Sample Format	Figure is unreadable.	Will be assessed and addressed in later version.
73.	4.2.4, 4.2.4-1	AUI- NRAO	Section 4.2.4 - Additional Guidance for Operations Estimates	No discussion of metrics? KPIs?	Will be assessed and addressed in later version. Metrics may also be more appropriately discussed in another section.
74.	4.2.4.4, 4.2.4-3 and 4.2.4-4	AUI- NRAO	Figure 4.2.4-1 Operations WBS and Budget Sample Format "Contingency, if requested, must be in compliance with Section 4.2.6 of this Guide."	Language discussing contingency in operations estimates – is that a thing now? Has been outlawed previously.	No change. LFM language has existed in section 4.2.6.
75.	4.2.5.1, 4.2.5-1	NSF BFA-LFO		Management reserved, if authorized, is held by NSF and not a portion of the Recipient's risk-adjusted TPC.	Accepted.

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76.	4.2.5.2, 4.2.5-2	AUI- NRAO	"The scope contingency should be well considered and strive to minimize negative impacts."	"Scope Contingency" is mentioned. Ok, but key point is it's hard to use late in the project... add some text to indicate that scope management plans/docs must be accompanied by time profile information?	No change. Sentence above states "... the project's prioritized and <u>time-phased de-scoping plan</u> should equal at least 10% of the baseline budget..."
77.	4.2.5.2, 4.2.5-2	AUI- NRAO	"...the project's prioritized and time-phased de-scoping plan should equal at least 10% of the baseline budget..."	Text says scope plan should be for at least 10% of baseline budget – you mean 10% of TPC?	No change. NSF Policy is 10% of baseline budget.
78.	4.2.5.2, 4.2.5-2	AUI- NRAO	"NSF does not normally hold a management reserve for a specific project as part of the TPC. As a result, the Directorate is responsible for the first 10% of costs which exceed the authorized TPC."	Good to make the relevant Directorate on the hook for the first 10%	No change. Comment is an observation and no response required.
79.	4.2.5.2, 4.2.5-3	AUI- NRAO	"Since development of contingency is statistically-based, there is a chance that not every risk will be realized at its maximum impact. Therefore, even when properly managed, it is possible that contingency dollars will remain at the end of the project."	Delete "even when properly managed" weird	Accepted.
80.	4.2.5.8, 4.2.5-10	AUI- NRAO	Each project in construction must report monthly to NSF on the status of the project, while projects in the Design stage are highly encouraged to submit a monthly report	Reporting also impacted by construction to operations transitions ... may be need for additional reporting in overlap period.	No change. Section 4.6.2 reference award terms and conditions (T&Cs). Reporting to NSF is defined in the governing CA/CSA and is applicable through the award end date. In cases where there are construction and operations CSAs in place, reporting is required for each award as defined in the governing terms and conditions.

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81.	4.2.5.5, 4.2.5-12	AUI-NRAO	Figure 4.2.5-1 Sample of a Change Control Request Form, with instructions for filling out the various sections	Fig 4.2.5-1 hard to read...	Will be assessed and addressed in later version.
82.	4.2.6, 4.2.6-1	AUI-NRAO	Section 4.2.6 Budget Contingency Planning during the Operations Stage	Again referring to contingency in ops. If we're doing this – what happens to unallocated contingency in Ops – roll to next year?	No change. LFM language has existed in this section.
83.	4.2.6, 4.2.6-1	Woods Hole-OOI	Budget Contingency Planning during the Operations	Need to correct typos/grammar: Text should read: “there are many inherent risks with operations” or “there is inherent risk with operations” and “Basis of Estimate”	Accepted.
84.	4.4, 4.4-1	AUI-NRAO	“Elements of the Transition Plan are first addressed during Conceptual Design, and become progressively more detailed as planning evolves. During construction, the PO reviews the plan, utilizing internal staff, external experts, consultants, external review panels and the resources of the Large Facilities Office.”	Para 3 talks about “Transition Plan” ... defined previously?	Accepted. Language deleted “Transition Plan” to align with terminology used in the rest of the guide, specifically 3.4.1 and 3.4.2.
85.	4.4, 4.4-1 and 4.4-2	AUI-NRAO	“The review of the plans for commissioning and acceptance should consider the following questions: ...”	To list of bullets ... add “discussion of risks to project from operations delays”?	Accepted.
86.	4.6.3.3 4.6.3-2	Woods Hole-OOI	“BSRs are conducted on a regular review cycle which is informed by the internal NSF annual Major Facility Portfolio Risk Assessment.”	Changing the five-year cycle to “a regular review cycle” makes the statement vague and opens up the possibility of more frequent BSRs. If the intent is to delete the five-year requirement (as is noted in #25 in the Summary of Significant Changes), perhaps the language should be the same as the referenced BSR Guide (although the posted version is old). The Guides identifies the frequency as “Whenever possible, the BSRs are conducted on a five-year cycle...”	No change. The intent is to delete the five-year cycle since the frequency is informed by the annual risk assessment. With this new framework it is feasible for NSF to conduct more frequent BSRs which align with the identified risk rather than a fixed time cycle. The BSR Guide is under revision to reflect the new framework and annual risk assessment.

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87.	4.6.3.6, 4.6.3-5 and 4.6.3-6	AUI-NRAO	Section 4.6.3.6 Earned Value Management Verification, Acceptance, and Surveillance	Refer to section 6.8?	Accepted.
88.	4.6.4, 4.6.4-1	Woods Hole-OOI	"The NSF performance metric goal (using EVM) is keeping both the total project cost and schedule variances against the Performance Measurement Baseline at, or better than, negative 10 percent."	Positive EVM Variances are important as they characterize the accuracy of the baseline estimate, so suggest changing this: "at, or better than, negative 10 percent," to "at, or better than, positive or negative 10 percent."	No change. The MFG requires Recipients to report both positive and negative cost and schedule variances >10% (see last paragraph of this Section and Section 4.6.2) The negative 10% in the first paragraph of this Section is referring to NSF's performance metric per GPRAMA and OMB requirements.
89.	4.6.4, 4.6.4-1	Woods Hole-OOI	"Projects that are less than 10 percent complete are not held to this goal because EVM data is less meaningful statistically in the very early stages of a project"	This statement is not correct. EVM in the earliest stages of a project are actually good indicators of the quality of the baseline budget and schedule. For example, statistics have shown that a project that is less than 10 percent underway, but has significant cost and schedule variances, is likely to never recover.	No change. This is applicable to NSF's performance metric per GPRAMA. This is not applicable to Recipient reporting to NSF. Recipient earned value reporting requirements are in Section 4.6.2.
90.	4.7.2, 4.7.2-1	AUI-NRAO	Section 4.7.2 Partnership Funding	Suggest you structure these agreements to produce a default operations number, consistent with a 5-yr plan. (ALMA is suffering from lack of this). Or a default that this year is last years plus the appropriate inflation.	No change. The comment is a Memorandum of Understanding (MOU) level of detail and not appropriate for the MFG.
91.	5, 5-1 thru 5-4	Woods Hole-OOI	Section 5 - GUIDANCE FOR MID-SCALE RESEARCH INFRASTRUCTURE PROJECTS	Overall comment: This section is much less detailed than others, although it does refer to other sections as reference. There are a wide variety of projects that will fit into this category, and while it is preferable to correlate the tracking and reporting overhead to the size of the project, the sections should list minimum requirements, and use established project management protocols to define the difference in management scope between a mid and large scale projects.	No change. Mid-Scale projects are defined in Section 1.4 of this document which is referenced in the first sentence of this section. The specific circumstances of each Mid-Scale project will be unique, as are larger MRFEC projects, and thus the oversight requirements need to be tailored through discussions between NSF and the Recipient. In addition, if there are minimum requirements, they will be detailed in the proposal solicitation.

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92.	5, 5-1	Woods Hole-OOI	Section 5 - GUIDANCE FOR MID-SCALE RESEARCH INFRASTRUCTURE PROJECTS	"does not preclude the requirement for appropriate rigor": Add detail to the remaining sub-sections that support this statement, similar to section 4.	No change. Mid-scale projects can take many forms from unique configurations of commercially procured equipment to projects requiring state of the art, not yet available technology. Thus, the oversight requirements for these projects need to remain flexible so an optimal solution can be tailored through discussions between NSF and the Recipient.
93.	5, 5-1	Woods Hole-OOI	"...some typical project characteristics that may be considered..."	change "Level of maturity on collaboration or partnerships" to "Level of maturity of collaborations or partnerships."	Accepted.
94.	5, 5-2	Woods Hole-OOI	"Mid-scale projects are selected based on the merit review criteria detailed in the program solicitation. However, some typical project characteristics that may be considered ..."	change "Technical feasibility and consideration of risks" to "Technical feasibility, cost impacts, and consideration of risks and opportunities."	Accepted. The following bullet was added to reflect that the that the proposal budget itself and life cycle costs may be considered: "Budget alignment with solicitation and lifecycle cost impacts."
95.	5, 5-2	Woods Hole-OOI	"Mid-scale projects are not subject to the formal stage-gate review process given in Section 2.3 of this Guide. However, the internal proposal review process used by NSF for construction/acquisition proposals should be sufficiently robust to assess readiness ..."	"not subject to the formal stage-gate review process", and the "internal proposal review... should be sufficiently robust": The "internal review" should list types of minimum criteria, and who within NSF conducts (and approves) the reviews. The NSF Program Officer?	No change. The minimum criteria for reviews of Mid-scale proposals will be detailed in the specific solicitation. The question of who within NSF conducts and approves the reviews depends on which office initiates the solicitation. Sometimes, solicitations are initiated by a specific Directorate or Division and others can be NSF-wide solicitations. The review process and approval authority may differ from one solicitation to another.

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96.	5, 5-3	Woods Hole-OOI	"Although substantial rigor is required in establishing the TPC, mid-scale research infrastructure projects are not subject to NSF's "No-Cost Overrun" policy used for major facilities projects."	"not subject to NSF's "No cost overrun" policy": Add formality to this statement, certainly add detail to section 4.3 (especially critical as other reporting / tracking mechanisms are being simplified).	Accepted. Added a reference to Section 1.4.5 for definition of TPC. Revised sentence as follows: "Although substantial rigor is required in establishing the Total Project Cost (TPC), projects are not subject to NSF's "No-Cost Overrun" policy used for major facilities projects as defined in Section 1.4.5."
97.	5, 5-4	NSF BFA-DGA	"LFO Liaison to assist Programs and the Grants Officers in the appropriate BFA unit (either the Division of Grants and Agreements (DGA) or Division of Acquisition and Cooperative Support (DACS)) depending on the funding program."	Revise to: "LFO liaison to assist Programs and the Grants <u>and Agreements</u> Officers in the appropriate BFA unit (either Division of Grants and Agreements (DGA) or Division of Acquisition and Cooperative Support (DACS)) depending on the funding program."	Accepted. For clarification, revised to: "LFO liaison to assist Programs and the Grants and Agreements Officers in the appropriate BFA unit, either Division of Grants and Agreements (DGA) or Division of Acquisition and Cooperative Support (DACS), depending on the nature of the project and the funding program."
98.	6.2, 6.2.1-1 through 6.2.12-1	AUI-NRAO	Section 6.2 Risk Management Guidelines for Construction Stage	Risk section (6) ... long. It's good, but I wonder if shouldn't be in a separate document.	Will be assessed and addressed in later version. NSF has equal concerns about the MFG growing in size and intend to pare down some sections as we enhance others. We may bring in a professional editor as part of a future revision to help with the organization and areas of duplication.
99.	6.2.11, 6.2.11-1 through 6.2.11-5	AUI-NRAO	Section 6.2.11 Contingency Management for Risk Mitigation	Any guidelines on what year dollars the contingency is stored in... then year? Do they inflate year to year when carried over?	Will be assessed and addressed in later version. Just like the initial NSB approved Project Baseline budget, contingency budget is part of the TPC approved by the NSB. See Section 6.2.8.8. Additional words will be considered as part of a later version.

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100.	6.3, 6.3.1-1 through 6.3.5-2	AUI-NRAO	Section 6.3 Guidelines for Cyber-Security of NSF's Major Facilities	IT/Cybersecurity guys reviewed the section. No significant comments, although they noted that several definitions were soft (e.g. cybersecurity component of IT budgets 3-12% ... deciding what to include/not means you can land on any number).	No change. Comment is an observation. Example text provided, as well as other phrasing in this section, is planned to be re-examined in a future version.
101.	6.3, 6.3.1-1 through 6.3.5-2	AUI-NRAO (Beasley)	Section 6.3 Guidelines for Cyber-Security of NSF's Major Facilities	The cybersecurity section lacks definition in many areas but was too prescriptive/detailed in others. Just a data point.	No change. Comment is a general observation. Section is expected to undergo revisions in future versions.
102.	6.3.1, 6.3.1-1	Trusted CI	"It is necessarily a living program that adapts, adjusts, and advances. As such, cybersecurity programs require reporting, evaluation, and updating of the program as appropriate."	Suggested change: Last sentence - strike "of the program" Justification: redundant and awkward phrasing	Accepted.
103.	6.3.1, 6.3.1-1	AURA-NSO (Cross)	6.3.1 Introduction "Data creation, sharing, and analysis are central to the progress of science. As information..."	Agreeable introduction and setup for the content of the entirety of Section 6.3.	No change. Comment is an observation. This Section is planned to be addressed in a future version.

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104.	6.3.2, 6.3.2-1 and 6.3.2-2	AURA-NSO (Cross)	<p>6.3.2 Major Facility Cybersecurity Program</p> <p>“Uniform Guidance §200.303 states that the Recipient’s internal controls, including technology infrastructure and security management, should be compliant with guidance published by the Comptroller General or Committee of Sponsoring Organizations of the Treadway Commission (COSO). ... The three pillars of a cybersecurity program rely on a project-specific inventory of “information assets” to be protected. Risk-based approaches to protection of information assets are further determined by a project-tailored “information classification” which recognizes varying degrees of value, priority, and/or sensitivity of the information assets. The information asset inventory and information classification are described in the Controls section.”</p>	<p>My interpretation of the MFG is that it is inherently directed towards NSF supported Large Facilities (LFs). I believe LFs are all sizeable programs with complex Information Technology Infrastructures. As such, I feel the NSF’s commentary here provides too much leeway to the LFs to define the size and scope of their information security program. In this case, I expect wide-ranging implementations of security practices across all NSF LFs. As a result, an example of cybersecurity difficulty would be requesting all LFs to deploy a critical security requirement. Should a security change be mandated, impacts of deploying the changes will vary greatly across the LFs, and could potentially cease work.</p> <p>As a real-world comparison, within Department of Defense (DoD) Programs, regardless of size (whether a single laptop, or thousands of computer systems), all programs must follow similar security program pillars – governance, resources and controls. These pillars are well-defined and provide program contractors specific information to implement these pillars, following detailed rules (not guidance), leaving little interpretation to the contractor. Within DoD Programs, information security programs will have little variance, and blanket modifications can be implemented with consistent impact across programs.</p>	<p>Will be assessed and addressed in a later version.</p> <p>Your interpretation is correct that the MFG is directed towards NSF funded major facilities (formerly called Large Facilities) as noted in Section 1.1 Purpose and Scope of the MFG.</p>

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105.	6.3.2	Trusted CI	<p>“Uniform Guidance §200.303 states that the Recipient’s internal controls, including technology infrastructure and security management, should be compliant with guidance published by the Comptroller General or Committee of Sponsoring Organizations of the Treadway Commission (COSO)¹. Further, the Cooperative Agreement Supplemental Financial & Administrative Terms and Conditions (CA-FATC) for Recipients of Major Facilities or Federally Funded Research and Development Centers (FFRDC)² requires an information security program³ and identifies a modest set of required components for the program. Additionally, an information security plan is a required element of the Project Execution Plan (PEP) per Section 3.4 of this Guide.”</p>	<p>Suggested paragraph replacement text: A cybersecurity plan is a required element of the Project Execution Plan (PEP) per Section 3.4 of this Guide. Additionally, based on Uniform Guidance §200.303, to the extent the award recipient’s IT infrastructure is integral to internal controls, the relevant portion of the cybersecurity program should be compliant with guidance published by the Comptroller General or Committee of Sponsoring Organizations of the Treadway Commission (COSO). Further, the Cooperative Agreement Supplemental Financial & Administrative Terms and Conditions (CA-FATC) for Recipients of Major Facilities or Federally Funded Research and Development Centers (FFRDC) requires an information security program and identifies a modest set of required components for the program. [add footnote references where appropriate]</p> <p>Discussion: The first paragraph is confusing since it is an amalgam of requirements from different sources with different scopes. We suggest moving the sentence with the broadest scope (the requirement for the PEP to include a cybersecurity plan) to the start of the paragraph. Next would be the requirement on the internal controls but reworded to narrow applicability to cases when internal controls implemented through information technology. Finally, close with the Cooperative Agreement Supplement(s). Note: Uniform Guidance §200.303 does not actually include the phrase “including technology infrastructure and security management”.</p> <p>Justification: The document now applies to more than Large Facilities or FFRDCs, so it adds clarity to state the requirements in order of scope. Also, clarifying the application of 200.303 to IT implementations of internal controls.</p>	<p>No change.</p> <p>The name change from “Large Facility” to “Major Facility” is to align with the American Innovation and Competitiveness Act (AICA) terminology as noted in the draft Major Facilities Guide (MFG). The MFG does not apply to any additional facilities than the Large Facilities Manual did. The portfolio of “Major Facilities” is the same as “Large Facilities”.</p> <p>The paragraph is structure based on the governing hierarchy of requirements starting with the Uniform Guidance. Section 1.2 of the MFG lists the hierarchy of documents from which MFG requirements flow from.</p> <p>Also, a PEP is required only for the construction stage of major facilities. The PEP is not required for facilities in operations, but parts of the PEP will evolve during construction and may be maintained during the operations stage.</p>
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106.	6.3.2, 6.3.2-1	Trusted CI	<p>“The three pillars of a cybersecurity program which rest on this foundation are governance; resources; and controls. Like other facility project components, the cybersecurity program should be appropriately represented in standard project documents and NSF oversight activities such as the project execution plan, project risk management plan, project budget, project reports, and project reviews.”</p>	<p>Suggest changing the sentence “The three pillars of a cybersecurity program which rest on this foundation are governance; resources; and controls.” To read “The four pillars of a cybersecurity program which rest on this foundation are mission alignment, governance; resources; and controls.</p> <p>Discussion: While the “research mission and goals of the facility” are foundational, the actual alignment of the cybersecurity program is an additional pillar because the program elements there need to evolve in concert with the other pillars.</p> <p>Justification: Adding the Mission alignment pillar will be consistent with the upcoming Trusted CI Framework.</p>	Will be assessed and addressed in a later version.
107.	6.3.2, 6.3.2-1	Trusted CI	<p>“The following sections define and describe a suggested framework for the facility cybersecurity plan. This framework is based on the previously mentioned three pillars of information security programs: Governance, Resources, and Controls.4 Major Facilities may use these pillars as a framework for founding, operating, evaluating, and improving their information security programs, and meeting the award terms and conditions.”</p>	<p>Suggest changing the sentence: “This framework is based on the previously mentioned three pillars of information security programs: Governance, Resources, and Controls.” To read: “This framework is based on the previously mentioned four pillars of cybersecurity programs: Mission Alignment, Governance, Resources, and Controls.”</p> <p>Discussion: Alignment with changes suggested for paragraph 2</p> <p>Justification: Consistent changes</p>	Will be assessed and addressed in a later version.

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108.	6.3.2, 6.3.2-1 & 6.3.2-2	Trusted CI	<p>“The three pillars of a cybersecurity program rely on a project-specific inventory of “information assets” to be protected. Risk-based approaches to protection of information assets are further determined by a project-tailored “information classification” which recognizes varying degrees of value, priority, and/or sensitivity of the information assets. The information asset inventory and information classification are described in the Controls section.”</p>	<p>Suggest inserting a new page formatting command</p> <p>Suggest changing the sentence: “The three pillars of a cybersecurity program rely on a project-specific inventory of “information assets” to be protected.” To read: “6.3.3 Mission Alignment</p> <p>The other three pillars of a cybersecurity program rely on a project-specific inventory of “information assets” to be protected.” Note: Requires changing the numbering of subsequent sections and updating page headers/footers</p> <p>Discussion: Add the Mission Alignment pillar</p> <p>Justification: See above</p>	Will be assessed and addressed in a later version.
109.	6.3.3 and 6.3.3.1, 6.3.3-1	AURA-NSO (Cross)	<p>6.3.3 Governance “Recommended governance elements ... and management.” “6.3.3.1 Roles and Responsibilities “Successful cybersecurity programs require an active role for facility leadership ... risk management decisions by facility leadership and information asset owners.”</p>	<p>While these recommendations and definitions are accurate and positive, I feel this is guidance (not mandates) that leaves these recommendations as options, open to acceptance or rejection by the LFs. I would prefer to see that each LF is mandated by the NSF to fill these roles and responsibilities, due to their importance to an overall security program.</p>	<p>No change. Comment is an observation and opinion on the generalized issue of mandating requirements vs. flexibility for major facilities to scope their own cybersecurity program. With the wide range of differences between NSF major facilities in both science community and management structures, NSF feels flexibility is appropriate in this version of the MFG.</p>

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110.	6.3.3.1, 6.3.3-1	Trusted CI	“In addition, most cybersecurity programs identify a senior security role, such as a Chief Information Security Officers (CISO) or Information Security Officer (ISO) as owner of the cybersecurity program and lead decisionmaker for operational aspects of the cybersecurity program.”	<p>Suggest changing: “In addition, most cybersecurity programs identify a senior security role ...” To read: “In addition, cybersecurity programs should have an identified senior security role ...”</p> <p>Discussion: Having an individual responsible for the cybersecurity program is important and should not be an undue burden. The task is not necessarily full-time but the core responsibility for the program should be centralized.</p> <p>Justification: Strengthen the guidance to have individual primary program responsibility</p>	Accepted.
111.	6.3.3.2, 6.3.3-1 and 6.3.3-2	AURA-NSO (Cross)	6.3.3.2 Policies “Every facility project with information assets will require the development, approval and implementation of some information security policies within its cybersecurity program. ...”	A stronger message would be for the NSF to adopt Trusted CI policy templates, and provide them directly from NSF accessible resources.	Will be assessed and addressed in a later version. NSF major facilities currently have access to Trusted CI project resources and documentation currently as noted in Section 6.3.3.2.
112.	6.3.3.3, 6.3.3-2	AURA-NSO (Cross)	6.3.3.3 Risk Management and Acceptance “Cybersecurity programs employ a risk-based approach to information security and as such, there is inherent acknowledgement by NSF that any valuable activity requires acceptance of residual risk. ...”	I am not confident LF leadership will acknowledge the importance of Risk Management and Acceptance of their security programs based on the commentary in section 6.3.3.3. I feel this important task could easily be ignored, or set aside, due to the lack of any NSF published requirement. LFs leadership is focused on their scientific project, and if they are not required to accomplish an information technology security related task, I would expect little effort and few resources being available to LF Cybersecurity/Information Technology teams for these types of activities.	No change. Comment is an observation and opinion on the generalized issue of mandating requirements vs. flexibility for major facilities to scope their own cybersecurity program. With the wide range of differences between NSF major facilities in both science community and management structures, NSF feels flexibility is appropriate in this version of the MFG.

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113.	6.3.3.3, 6.3.3-2	Trusted CI	“In addition to the Center for Trustworthy Scientific Cyberinfrastructure (CTSC) guide which is tailored to the scientific community, ...”	<p>Suggest changing: “Center for Trustworthy Scientific Cyberinfrastructure (CTSC)” To read: “Trusted CI”</p> <p>Discussion: CTSC has changed its name to Trusted CI.</p> <p>Justification: Update organization name</p>	Accepted.
114.	6.3.3.4, 6.3.3-2	Trusted CI	“Given the dynamic technology and cybersecurity landscape, organizations are advised to plan for periodic evaluations of the cybersecurity program, including policies, practices, and controls. While project management and NSF oversight will involve regular reporting and review of program milestones, outcome metrics, and incidents, the project is encouraged to consider periodic self-assessments, external or stakeholder reviews, and evaluation of incident response. Tools are available from variety of sources to aid in assessment.”	<p>Suggest changing: “... organizations are advised to plan for ...” To read: “... organizations should plan for ...”</p> <p>Suggest changing: “... the project is encouraged to consider ...” To read: “... the project should include in the NSF review ...”</p> <p>Discussion: Given that NSF oversight will require a review of the cybersecurity program, the language in this paragraph should be strengthened.</p> <p>Justification: Ensure the cybersecurity program undergoes periodic evaluation and review</p>	<p>Accepted.</p> <p>Will be assessed and addressed in a later version.</p>

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115.	6.3.3.4, 6.3.3-2	AURA-NSO (Cross)	6.3.3.4 Evaluation “Given the dynamic technology and cybersecurity landscape, organizations are advised to plan for periodic evaluations of the cybersecurity program, including policies, practices, and controls. ...”	I like the tone of this section. It does tend to conflict with the remainder of the overall section 6.3. All of section 6.3 is providing guidance of some sort, but does not prepare or setup the LF for NSF oversight: security evidence/reports, review of milestones, metrics, incidents, etc. These are tangible NSF actions that I feel an LF cannot appropriately prepare for without specific actions, controls, etc. for the LF to fulfill. Simple example: If the NSF does not require minimum password complexity, how can an LF define password complexity to be compliant with NSF expectations during an NSF oversight exercise?	No change. Recipients are required to establish and maintain a cybersecurity program in accordance with the award terms and conditions for compliance with Uniform Guidance. If an NSF oversight exercise were conducted, the expectation is that the Recipient is following their established and documented program.
116.	6.3.4.1 and 6.3.4.2, 6.3.4-1	AURA-NSO (Cross)	Section 6.3.4 Resources Subsections 6.3.4.1 Budget and 6.3.4.2 Personnel	I do not understand the value of this section, and I believe it will be less useful to LF leadership. This may be a stretch, but I feel including comments about how the LF is required to include Cybersecurity funding line-items/work breakdown structure codes will have more impact. My feeling as an IT professional is that these funds should be included as separate/called-out “bucket” within all LF Cooperative Agreements between the NSF and the LF. Cybersecurity seems as-needed as every other aspect of the LF’s construction and operations, so I would ask why are Cybersecurity funds not outlined and agreed upon during initial LF support by the NSF? The current Cooperative Agreement Supplemental Financial & Administrative Terms and Conditions (CA-FATC) for Recipients of Major Facilities or Federally Funded Research and Development Centers (FFRDC) are far too vague for LFs to implement security programs that the NSF (or outside security consultant) could review comparatively.	No change. As noted in Section 6.3.2, there are various considerations in developing and maintaining a cybersecurity program including a budget. The MFG gives major facilities the flexibility to balance the mission and goals with good business practices.

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117.	6.3.4.2, 6.3.4-1	Trusted CI	“In addition to technical skills, teaching skills, communication skills and negotiating skills are endemic to cybersecurity programs and are, therefore, necessary personnel considerations.”	<p>Suggest changing: “In addition to technical skills...” To read: “While technical skills are important ...”</p> <p>Discussion: The sentence is easily misread due to the comma-separated list.</p> <p>Justification: Better separation of “technical skills” from the other listed items</p>	Accepted.
118.	6.3.5 6.3.5-1 and 6.3.5-2	AURA-NSO (Cross)	Section 6.3.5 Controls Subsections 6.3.5.1 Information Asset Inventory, 6.3.5.2 Information Classification and 6.3.5.3 Control Set	<p>I like calling out these controls, assets and information classification guidelines. This section, 6.3.5, is the heart of what a LF Chief Information Security Officer would be looking for from the NSF to ensure their LF was maintaining a proper Cybersecurity program, with respect to the NSF. In my position, I would hope there would be a control set requirement guide, with specific and detailed controls, that mandated LF’s compliance. I believe stronger wording, with accountability, would move LFs toward better overall security posture. Even if the NSF does not now have a mechanism to be the Cybersecurity “Police”, having the requirements in place for LFs to implement would be extremely beneficial. This would arm LF Cybersecurity and Information Technology professionals with a minimum set of security controls to deploy across the LF’s infrastructure. In this scenario, LFs could collaborate within a cybersecurity control set ‘language’ that is recognizable across the entire NSF landscape. Currently, LFs can only discuss how to deploy certain technologies. As it stands now, LFs cannot help one another with deploying specific technologies and mechanisms to ensure their information security program controls are meeting NSF defined/blessed Cybersecurity settings and requirements.</p>	No change. Comment is an observation.

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119.	6.3.5, 6.3.5-1	Trusted CI	“Information security objectives, and controls, center on confidentiality, integrity and availability. Controls are designed to the facility’s portfolio of information assets and aligned to the corresponding information classification for those information assets.”	<p>Suggested paragraph replacement text: “Controls are tailored to the facility’s portfolio of information assets and aligned to protect confidentiality, integrity, and availability based on the corresponding information classification for those information assets.”</p> <p>Discussion: The paragraph is poorly worded or contains redundant information.</p> <p>Justification: Better wording for the point being made.</p>	Accepted.
120.	6.3.5.1 and 6.3.5.2, 6.3.5-1 and 6.3.5-2	Trusted CI	Section 6.3.5.1 “Information Asset Inventory” and 6.3.5.2 “Information Classification”	<p>Suggested change: Move the two sections under the Mission Alignment pillar and renumber the Control Set section. Make appropriate page header/footer alterations.</p> <p>Discussion: The subsections now belong under Mission Alignment and should be moved entirely under that pillar.</p> <p>Justification: These topics are part of the Mission Alignment pillar.</p>	Will be assessed and addressed in a later version.
121.	6.3.5.1, 6.3.5-1	AUI-NRAO	Section 6.3.5.1 Information Asset Inventory – “Organizational identification and location of information assets is a prerequisite to competently securing those assets. See, CIS Critical Security Controls 1 and 2,1 and NIST 800-53 control CM-8.	IT here claims that NIST 800-171 is the more appropriate reference.	No change. NIST 800-171 is a subset of NIST 800-53 and focused on confidentiality. The existing reference is merely meant to reinforce the importance of information asset inventory.
122.	6.3.5.1, 6.3.5-1 and 6.3.5-2	AUI-NRAO	Section 6.3.5.1 Information Asset Inventory	Definition of “Information Systems” .. the scope you suggest is “insane”, according to my guys; SCADA and HVAC? Too deep. Need layered security.	Accepted. Last sentence is removed – that text does not appear in the U.S. Code 3502 under the definition of an “information system”.

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123.	6.5, 6.5-1 and 6.5-2	AUI-NRAO	Section 6.5 Environmental Considerations in Major Facility Planning	Seems pretty short for what is what of the most detailed and painful parts of NSF construction planning.	No change. Environmental regulations governing NSF construction are basically the same as for other Federal Agencies. As noted, determining the level of compliance activities is complex and POs are to consult with OGC.
124.	6.8, 6.8-1 through 6.8-3	AUI-NRAO	Section 6.8 Guidelines for Earned Value Management Systems	Doesn't talk about the formal requirements for EVMS mentioned earlier? sect 4.6.3.6	No change. The verification, acceptance, and surveillance conducted by NSF is the last three bullets of Section 6.8.3 and references Section 4.6.3.6.
125.	6.8, 6.8-1	Woods Hole-OOI	"NSF recognizes that a properly implemented Earned Value Management System (EVMS) can provide accurate and reliable performance measurement metrics and forecast potential problems to support sound and timely management decisions. A properly implemented EVMS is also essential to inform NSF's oversight of the project."	EVMS can provide metrics and uncover problems, so change "forecast" to "uncover." Remove the word "also" from last sentence.	Accepted. The language was revised to include forecasting and uncover potential problems. EVMS is a project control tool for the Project Management Team (Recipient) and the monthly earned value results inform NSF.
126.	6.8.1, 6.8-1	Woods Hole-OOI	"Plan all the project's work scope to completion."	The first bullet appears to disallow the use of "Planning Packages," which are commonly used for activities with known work content but without detailed schedule activities. Is this correct?	Accepted. Language was added to clarify the use of planning packages is acceptable.
127.	6.8.1, 6.8-1	Woods Hole-OOI	"Break down the project work scope into finite pieces that are assigned to a responsible person or organization for control of technical, schedule and cost objectives."	Suggest replace the word "control" with "delivery"	No change. The responsible person is the control account manager for delivery of the finite piece of work; therefore "control" of the objectives associated with the scope is appropriate.

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128.	6.8.1, 6.8-1	Woods Hole-OOI	"Use actual costs incurred and recorded in accomplishing the work performed."	Suggest replace the word "accomplishing" with "calculating"	No change. Principle is as outlined in EIA-748. Typically, actual costs should not be the source to determine the earned value (work performed).
129.	6.8.1, 6.8-1	Woods Hole-OOI	"Objectively assess accomplishments at the work performance level."	Suggest replace the word "performance" with "package"	No change. Principle is as outlined in EIA-748.
130.	6.8.1, 6.8-1	Woods Hole-OOI	"Analyze significant variances from the plan, forecast impacts, and prepare an estimate at completion based on performance to date and the remaining work to be performed."	Suggest adding "develop corrective actions," following "forecast impacts."	Accepted.
131.	6.8.2, 6.8-2	Woods Hole-OOI	"...EVMS should be implemented in a way that can provide the Recipient management team a reliable basis for objectively assessing performance against plan..."	add "with" before "a reliable basis..."	Accepted.
132.	6.8.3, 6.8-3	Woods Hole-OOI	Section "Guidelines for Establishing an EVMS."	Add EVMS Training to this section.	No change. Training is not a component of EIA-748, nor NDIA Intent Guide. Concur the Recipient's project management staff need to understand the concepts of earned value. This can be achieved through experience and/or training.
133.	7, 7-1	Woods Hole-OOI	References: "Guide to the Project Management Body of Knowledge, (PMBOK® Guide), Project Management Institute, 5th Edition, 2013"	Guide to the Project Management Body of Knowledge is currently on 6th Edition, 2017.	Will be accessed and addressed in a later version. The changes in the 2017 PMBOK have not been reviewed yet to assess changes to the MFG.
134.	8, 8-1	Woods Hole-OOI	Acronyms: "CDR Conceptual Design Review"	The most common widespread definition of "CDR" is "Critical Design Review," not "Conceptual Design Review." Conceptual Design Reviews are frequently abbreviated to "CoDR."	No change. The acronym "CDR" has multiple meanings. For NSF major facilities, it is Conceptual Design Review as defined in this Section.

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135.	9.2, 9.2 through 9-15	AUI-NRAO	Section 9 Lexicon	Seemed like there are entries missing, and entries for items not called out (Pessimistic Duration .. seems like there was more pedagogical scheduling info in here at some point). Fonts weird. Few entries out of alphabetical order.	Will be assessed and addressed in a later version. Section 4.3 is reserved for future content on schedule development and analysis. In conjunction, the Lexicon will be reviewed. The entries in italics are from Project Management Institute, Inc lexicon as noted in the footnote on each page of the lexicon.
136.	9, 9-7	Woods Hole-OOI	Lexicon: "Independent Cost Estimate Review. One of eight types as defined by the Government Accountability Office (GAO) used by NSF to help validate the Recipient's estimate. An Independent Cost Estimate (ICE) is one of the eight types."	Second sentence of ICE is redundant to the first sentence.	Accepted. Language was revised to clarify that there are eight types of Independent Cost Estimate Reviews and ICE is one of those eight types.
137.	Financial Tool	Woods Hole-OOI	NSF Financial Data Collection Tool for Major Facilities 2019 - CSA Budget Worksheet, Column E - Current Expenditures	Blue cells in Column E of tab "CSA Budget Worksheet" appear to be missing the proper formulas. I believe they should be linked to the "CSA Cost Worksheet".	Accepted. Worksheet will be revised so blue fields are prepopulated.