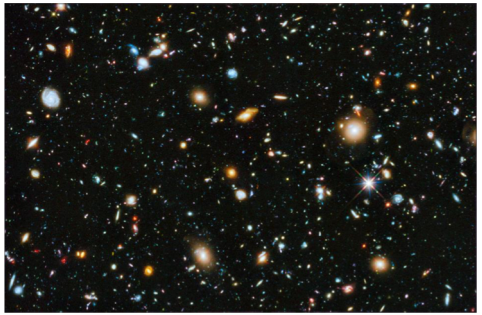
National Aeronautics and Space Administration

SOFIA Operations & Maintenance Efficiency Review (SOMER)

SOFIA 5-Year Flagship Mission Review (S5YFMR)



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Philosophy for the reviews

- SOFIA's initially agreed upon 5-year prime mission will be completed at the end of FY19
- At the end of a prime mission, NASA usually assesses the science performance, management of a program and proposed future science to decide on an extension of the program through a Senior Review Process
- However, the 2018 Consolidated Appropriations Act forbade NASA from placing SOFIA in the 2019 Senior Review

Philosophy for the reviews

- Given that the program has finished 5 years of operations, the time is appropriate to review 2 aspects of the SOFIA Project:
  - A review of SOFIA's maintenance and operational paradigm to assure that SOFIA is optimally efficient and effective in planning and executing the science program.
  - A review of SOFIA's science progress and science prospects to assure that SOFIA is and will remain scientifically productive and relevant.
- The results of these reviews will provide input into the FY20 Op Plan and FY21 budget formulation. **The reviews will not consider closeout or cancellation of SOFIA.**

SOFIA Operations & Maintenance Efficiency Review (SOMER)

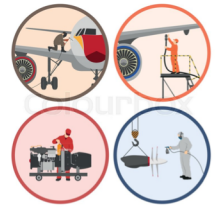
The objective of this review is to establish a baseline for comparison between the current SOFIA operations and maintenance model with alternative SOFIA aircraft operations and maintenance models **with the goal of achieving a substantially greater number of flights and/or reducing overall program cost**.

SOFIA Operations & Maintenance Efficiency Review (SOMER)

Aircraft Operations & Maintenance means end-to-end operations of the plane, the costs of which include FTEs/WYEs and material costs for flight, fuel, parts, and maintenance. **It includes, everything <u>except</u> strictly science operations and science management.** There will be some cases of overlap which can be clarified at the time of the review and captured appropriately in the costing.

The SOMER is directed to **<u>start with a blank slate for SOFIA operations</u>** and assume that SOFIA, its entire spare parts inventory including the spare planes, the spare engines, and its instruments are available. The instruments will be considered only to the extent that any aircraft operations and maintenance model changes affect the use of the science instruments.

The SOMER is charged with the following:



1. Assess the current baseline for the current model of aircraft operations and maintenance for SOFIA and characterize it by the number of flights and the total operations and maintenance costs. Assess the current baseline for the maintenance model and plans for spares, procurements and critical items list as well as the mean time between failures for parts and any subsystem and/or the plane. Assess the current baseline management structure by interviewing both management and staff personnel as appropriate.
2. Explore alternative models of aircraft operations and maintenance for SOFIA to achieve substantially more flights annually and characterize the aircraft operations and maintenance costs that support such models.
3. Study and recommend strategies and combinations of procedures from different operations and maintenance models to achieve substantially increased flights annually for a minimum of cost.

The SOMER is charged with the following:

4. For each different model, provide specific numbers of WYE/FTE needed for aircraft operations and maintenance, broken out by skill sets required to achieve the increased flight cadence.
5. Discuss sustainability of models over next 5, 10 and 15 years. Evaluate the risks, costs and mitigations (if any) for up to 15 more years of reliable operations, including whether the current baseline of spares and preventative maintenance supports these models.
6. Recommend changes to staffing, culture and environment for increasing the efficiency and reliability of operations and maintenance of the aircraft.

SOMER Schedule & Deliverables

Oct 4	SOMER panel convenes.
Oct 10-11	SOMER panel meets with SMD, AFRC, ARC and SOFIA management Palmdale.
~Oct 15	SOMER panel requests initial questions / information from SOFIA.
Oct 19	SOMER provides additional list of questions / required information to the project
Nov 28	Project provides additional written responses to SOMER requests
Mid-Dec	SOMER visits Palmdale / Ames to discuss responses / continue analysis (if needed)
Mid-Jan	SOMER completed; draft report shared with project for feedback/corrections of errors.
Feb 1	Project responds to SOMER draft report.
Feb 15	SOMER report submitted; input for Five Year Flagship Mission Review.

Deliverables

1. Draft presentation to SOFIA project for feedback / correction of errors
2. Presentation to SMD with the assessment results
3. Final report with findings

SOMER Panel Membership

1. Shane Dover (Chair)	**Chief of Flight Operations, NASA Langley**
2. Elbert (Lucien) Cox	Executive Secretary, SOFIA PE, NASA HQ
3. Carol Carroll	Program Operations, NASA ARC Deputy Director
4. Thomas Decher	Operations, Special Mission Aircraft Services, Lufthansa
5. Matt Elder	Research Pilot / Aircraft Operations, NASA Langley
6. Christy Hansen	Program Management, Airborne Science Operations, NASA GSFC
7. Andy Roberts	Government & Commercial Management of Aircraft Operations & Maintenance, Bay Area Environmental Research Institute
8. Mihailo Rutovic	Aircraft Operations, Program Management, Engineering, NASA JSC
9. Rick Shetter	Aircraft Operations for Science, Bay Area Environmental Research Institute
10. Bruce Tagg	Agency Strategic Management of Airborne Science, NASA HQ
11. Mike Thompson	Airborne Program, NASA AFRC
12. Burkard Wigger	Fleet-management, Flight-operations, Airworthiness & Maintenance Management, DLR

Current Status of SOMER

- Panel met at Palmdale Oct 11-12
- New RFIs / RFAs generated:
  - Program asked to develop a six-flight a week con-ops model
  - Very detailed budget information requested
- Panel has a good idea now of the current baseline and possibilities for optimization and will be discussing alternative models of operations.
- SOFIA Program has been extremely helpful in providing all needed information for the panel - review welcomed and supported by both centers' leaderships
- Initial guidance from SOMER is that as we develop a TOR for the S5YFMR we consider a similar charge for optimization of science operations (e.g. number and length of instrument campaigns, flight time, alternative models for science operations).

SOFIA Five Year Flagship Mission Review (S5YFMR)

The objectives of the S5YFMR will be:

a. Evaluate SOFIA's continuing relevance to Agency's Strategic Plan
b. Assess SOFIA's performance with respect to expectations established in the Program Commitment Agreement (PCA) and Project Plan
c. Determine SOFIA's ability to execute its implementation plan with acceptable risk within cost and schedule constraints
d. Assess the scientific merits of expected returns from SOFIA during FY20-22 and FY22-25,
e. Assess the cost efficiency, particularly the science value per dollar, data availability and usability, value of data for archival / legacy purpose, and vitality of SOFIA's operations center.

- The S5YFMR panel will consist of senior members from astrophysics community, as well as mission operations experts (and two-to-three SOMER members).
- Like the SOMER, it will be a joint NASA-DLR review.
- The S5YFMR will use the SOMER report as input.
- The panel will likely look for optimizations and innovations to optimize science.

SOFIA Five Year Flagship Mission Review (S5YFMR)

Tentative S5YFMR schedule:

Early November:	Draft TOR sent to **APAC**, SOFIA, ARC, AFRC, USRA, DLR for comments and suggestions
Mid-November:	Final TOR for S5YFMR
Early Feb:	S5YFMR panel convenes
Mid Feb:	S5YFMR makes site visits / generates RFIs/RFAs
Thru early Mar:	S5YFMR considers SOFIA project responses / continues drafting
Late Mar:	S5YFMR report due
May 2019:	APD, DLR & SOFIA project formulate plan for optimized SOFIA operations based on the two reports