



# **2019 COV for The Division of Civil, Mechanical, and Manufacturing Innovation (CMMI)**

**Chair: Delcie Durham, University of South Florida**  
**Co-Chair: Yan Jin, University of Southern California**  
**Date: June 27, 2019**

# Overview of COV

- *Review Meeting Date: June 26-27, 2019*
- *Review Period: Fiscal Years 2015-2018*
- *Review Volume: 320 Jackets Total (~22-23 Jackets/Member)*
- *Sampling Method: Stratified Random Sample*
- *ENG AdCom Report Presentation: October 24, 2019*

# COV Members

**Chair: Dr. Delcie Durham**, University of South Florida  
**Co-Chair: Dr. Yan Jin**, University of Southern California

<b>Dr. Lesley Berhan</b> , University of Toledo	<b>Dr. Byun-Lip Lee</b> , Air Force Office of Sponsored Research
<b>Dr. Tabbetha Dobbins</b> , Rowan University	<b>Dr. Majid Manzari</b> , George Washington University
<b>Dr. Neil Duffie</b> , University of Wisconsin-Madison	<b>Dr. Daniel McAdams</b> , Texas A&M University
<b>Dr. Sara Wadia-Fascetti</b> , Northeastern University	<b>Dr. David Meaney</b> , University of Pennsylvania
<b>Dr. Carol Friedland</b> , Louisiana State University	<b>Dr. Grace Peng</b> , National Institutes of Health
<b>Dr. Scott Grasman</b> , Kettering University	<b>Dr. Lawrence Seiford</b> , University of Michigan
<b>Dr. Robert Ivester</b> , U.S. Department of Energy	<b>Dr. Gregory Washington</b> , University of California-Irvine, ENG AdCom



# Section I: Quality and Effectiveness of Merit Review Process

Overall, there is strong evidence that the CMMI Division consistently followed appropriate review processes for the 14,000+ proposals submitted during the FY15-FY18 period and that the merit review process has been working effectively and efficiently.

The majority of the proposals were reviewed by panel, and the COV found the panel summaries to be excellent, providing comprehensive and clearly articulated critiques of the proposed work. For the most part, individual reviews provided substantive assessment of the technical merit. The program officer rationale for award/declination decision was clearly documented for all but a few of the panel-reviewed proposals. The division staff is commended for the attention to compliance with NSF requirements.

# Section I: Quality and Effectiveness of Merit Review Process

Special Solicitations, such as LEAP-HI often employed a two-stage review panel process. EAGER and workshop proposals typically were evaluated through ad hoc or internal reviews

The COV found that there is a continuing lack of consistency in the attention paid to broadening impact (BI), by principal investigators and by reviewers. In many reviews, the intellectual merit (IM) was addressed in more detail and depth than the B.I. Panel summaries rectified this to some degree through discussion of the strengths and weaknesses of both IM and BI.

## **Recommendations:**

- Reviewers should be instructed to provide substantive justification under “strengths” and “weaknesses” for both IM and BI components of the review.

# Section I: Quality and Effectiveness of Merit Review Process

## Recommendations:

- Efforts should be made to assure that the Review Analysis and other documentation prepared by the program officer include specific detail to clearly justify the rationale for the decision.
- Some panel summaries included “Suggestions for Improvement” and the COV supports the implementation of this as helpful to the PIs, particularly for special solicitations or CAREER proposals.
- CMMI should continue to explore efforts to balance the panel size (number of proposals, panelists, reviews/proposal) across clusters and programs.
- Final award decisions for special solicitations should be reviewed by at least two program officers to reduce any appearance of bias.

# Section II: Selection of Reviewers

CMMI recruited reviewers with high technical qualifications and maintained a strong panel review process. The COV was impressed with the technical depth of many reviews and summaries of panel discussions for both the declined and funded proposals. The COV commends the work of CMMI Program Directors in trying to ensure that panels were balanced by gender and ethnic diversity. Identified reviewer conflicts of interest (COI) were recognized and resolved. For special solicitations requiring the two-stage review process, CMMI made strong efforts to create panels to provide a comprehensive view of the proposed work so that proposals were reviewed fairly and completely.

# Section II: Selection of Reviewers

## Recommendations:

- Program officers should clearly document how any potential conflict of interest identified during the panel meeting is managed. This extends to any program officer COI identified during the panel review as well.
- CMMI should continue to improve panel diversity by growing a pool of potential reviewers using the annual reviewer data analytics and other sources.

# Section III: Management of the Program Under Review

The CMMI division is the largest in the Engineering Directorate with a demanding workload for program officers and staff. The management of the programs appears to have been effective and efficient. The overall quality and integrity of the materials reviewed were excellent.

CMMI has employed numerous steps to effectively manage the merit review process and facilitate new and cross-disciplinary avenues of research by streamlining processes, training program officers, realigning programs into four clusters plus special solicitations, and adding data analysts to the staff. The division has also moved from two submission deadlines to a more open format in an effort to reduce the submission pressure on submitters and program staff.

In general, the documentation supporting the decisions of the program officers was complete, with clear justification for the award/decline decision.

# Section III: Management of the Program Under Review

The small number of “red flags” found in the jackets reviewed were typically attributed to a lack of clarity in documentation, inconsistencies between reviewer comments and panel summaries or a sparse review that didn’t address a specific criterion. The COV attributed the majority of these to the intense workload of program officers and staff.

## Recommendations:

- CMMI should continue to develop and implement training, oversight and streamlining activities promoting the high standards of the division.
- The COV recommends CMMI consider four reviewers as the standard for unsolicited proposals to address inconsistencies found in the jackets reviewed (cases with 3 to 6 reviewers).
- CMMI should continue to address recommendations of the 2019 COV in the same thorough, point-by-point annual method used for the last COV.

# Section IV: Resulting Portfolio of Awards

The COV commends CMMI on the management of the division portfolio to balance limited resources across a diverse set of investigators, large numbers of proposals, and emerging areas of research.

The number of women and URM submitting proposals is commensurate with the academic demographics, and the proportion of awards is essentially equal to that of the proposals submitted.

The large awards of NHERI, an expansion of the George E. Brown, Jr. Network for Earthquake Engineering Simulation Operation, provides a unique opportunity for researchers to utilize NEES sites.

Special solicitations and programs such as LEAP-HI provide opportunities for CMMI to facilitate research in an area of national importance.

# Section IV: Resulting Portfolio of Awards

## Recommendations:

- The COV encourages the division to continue to grow the LEAP-HI activity and to look for similar opportunities to expand the research portfolio in emerging areas.
- CMMI should consider additional funding mechanisms for early career/unfunded researchers such as initiation awards to address any potential bias towards funding more experienced researchers at R-1 institutions.
- Metrics should be developed that can be used to judge the transformative impact of proposed research across the division.
- Benchmarking methods for assessing outcomes of cross-disciplinary awards for CMMI programs and special solicitations should be considered. Such information could lead to an NSF-wide effort evaluating the long-term impact of interdisciplinary activities.

# Section IV: Resulting Portfolio of Awards

## Recommendations:

- CMMI should continue to develop ways to reduce proposal load impact as well as the actual proposal load. The COV suggested investigating staged submissions of EAGER-like proposals to be followed by larger/longer funding opportunities within clusters.
- CMMI should investigate how to present portfolio data in a larger context to help in the division's strategic planning process.

# Section V: Other Topics

- In line with the recommendations regarding balancing and prioritization within programs and across clusters, a thorough assessment of program portfolios should be conducted. The division could then perform several “right-sizing” and resource management analyses for programs and the division, as benchmarked against NSF as a whole.
- An annual assessment of workshop and special solicitation activities should be performed to determine efficacy and potential impact in emerging areas.
- The members of the COV found the electronic availability of jackets to be a significant benefit as they each reviewed some 23 or 24 jackets.

# Thank You!

