

# Reëxamining the Merit Review Process

AC-ENG

October 27, 2011

The Merit Review Working Group

# In a nutshell

## ■ Look for potential enhancements to the merit review process that:

- Reduce the burden on reviewers & proposers
- Stimulate the submission of high-risk/game-changing ideas
- Ensure that the process identifies/funds an appropriate portion of high-risk, game-changing ideas
- Use technology to facilitate the merit review process
- Broaden participation in the review process
- Maintain the quality of NSF's merit review process (do no harm!)

## ■ Develop:

- A design for a program of pilot activities
- A framework for evaluating past and future pilots

## ■ Engage:

- NSF staff and the research community in developing, testing and assessing novel methods of proposal generation and proposal review

## ■ Focus is on review process not review criteria.

# Trends

Proposals Received vs. Concurred FY2002 to 2010

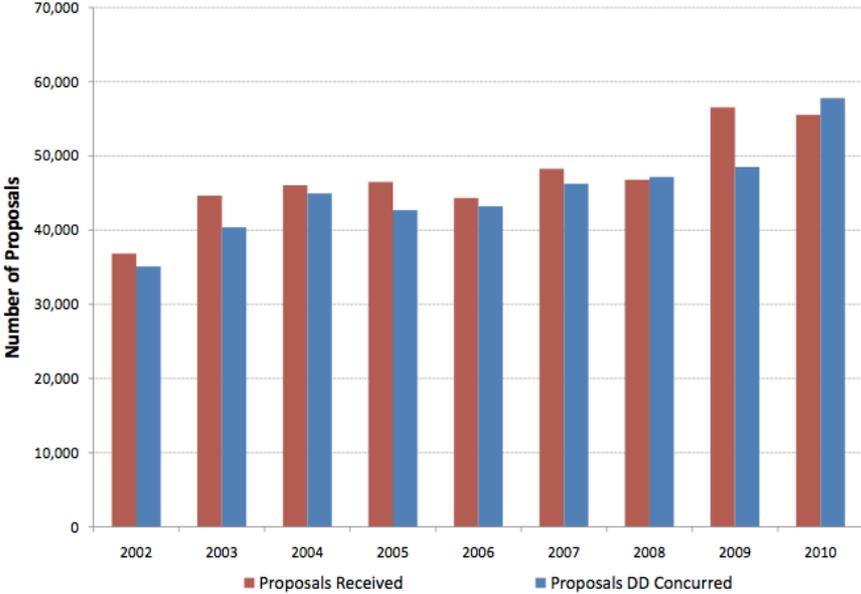
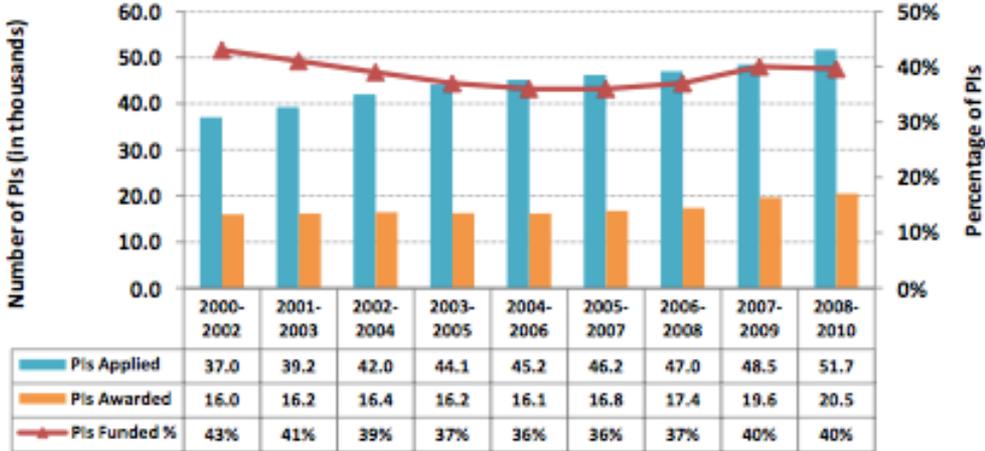


Figure 9  
NSF PI Funding Rates for Research Grants

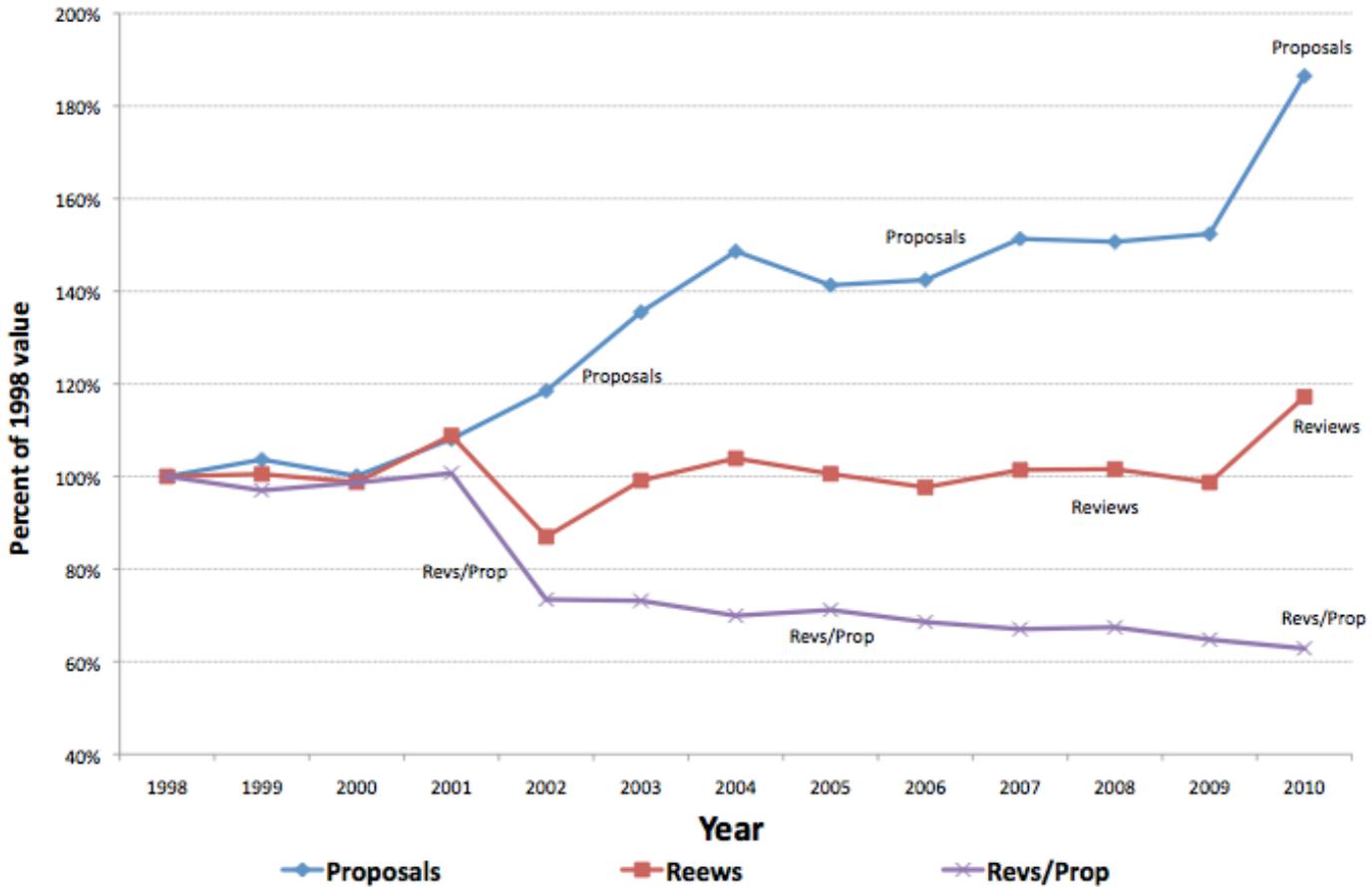


Proposals per PI per award

2001 - 2003	2002 - 2004	2003 - 2005	2004 - 2006	2005 - 2007	2006 - 2008	2007 - 2009	2008 - 2010
2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.3

**Estimate of effort per award  
= 19.5 x 2.3 = 45 days**

**NSF Proposal and Review Trends**  
FY1998 to 2010



# Strawman ideas for possible merit review pilot activities

- We have received a number of suggestions for potential enhancements to merit review. Please help us analyze some of them!
- On each slide, one version of the idea itself is sketched in the upper left quadrant.
- (a) What are the benefits and drawbacks that strike you?
- (b) How might some of the drawbacks be mitigated?
- (c) How would you rank these ideas for potential pilots?

# Examples of potential new experiments

- *PI response to reviews prior to decision*
- *Return non-competitive proposals based on Program Officer review*
- *Wiki-based reviews*
- *Increased use of virtual panels*
- *More use of preliminary proposals*
- *Double-blind review*

# PI response to reviews prior to decision

**Idea:** Enhance FastLane so that Programs that wish to can easily provide PIs an opportunity to respond to reviews at some point in the merit review process:

E.g. (1) Respond to individual reviews before a panel meets to discuss

(2) Respond to reviews and panel summary, before decision, if a proposal is “on the bubble” or PO has a specific concern

Goal of such a step is to enable PIs to correct any factual errors or misunderstandings on the part of the reviewers.

Some NSF programs already do this.

Some other funding agencies routinely allow for PI response.

The European Peer Review Guide, advocates that PIs be given a chance to respond to, at the least, *ad hoc* reviews prior to the proposals consideration by a review panel.

## ***Potential Benefits***

- Correction of factual errors made by reviewers ahead of a funding decision.
- Increase perception of fairness of the review process on the part of PIs

## ***Potential Drawbacks***

- Lengthens the merit review process.
- Opportunity may have to be given to all proposers in a program’s funding cycle.
- Some PIs may not be able to provide comments in a timely fashion (e.g. if away in the field for an extended period).
- Modifications to e-business systems require time and expense.

## ***Potential Mitigation Steps***

- Provide PIs with a strict time limit for comments (e.g. one or two weeks) with PO discretion to grant an extension in exceptional circumstances; e.g., if the PI is away on field work.
- Limit opportunity to comment to those proposals “on the bubble” for funding.
- Provide a clear statement in the program description or solicitation if such an opportunity is to be provided, when it will be provided, to whom, and in what interval a response must be provide.
- Make the necessary modifications to e-business systems part of a larger, comprehensive overhaul rather than a standalone change.

# Return non-competitive proposals

**Idea:** There are many possible approaches to filtering non-competitive proposals by POs without the benefit of external review. Below are three examples:

- PO may decline without external review; PO's review must state explicit reasons for decline; PI may request that a proposal declined without external review go through external review anyway but then, if it is not recommended for funding, PI must not submit a proposal for 12 months.
- PO may decline up to xx% of submissions without external review; a PI may not be declined without external review on two successive proposals.
- If a PI has been declined (with the benefit of external review) three times in a row as a PI or co-PI, a PO may not accept subsequent proposals for external review for a year without writing the PO's own review and affirming that the proposal appears competitive.

## ***Potential Drawbacks***

- Likely to be unpopular with PIs whose proposals are declined in this way.
- POs, especially IPAs, may find it difficult to apply this to PIs who are prominent figures in their fields. As a result, the use of decline without external review may fall disproportionately on young investigators and under-represented groups.

## ***Potential Benefits***

- Reduction in reviewer workload.
- In the long run, there may also be a reduction in proposal pressure or improvement in proposals. (PIs that are frequently declined without peer review may rethink where or what they are proposing.)

## ***Potential Mitigation Steps/Factors***

- The DD must review the PO recommendation.
- After a certain number of declines without outside reviews a PI may submit a proposal and have it automatically go out for external review. (Would not apply to proposals returned without review because of other factors; e.g., inappropriateness for program.)
- PIs could have the option of insisting that a proposal that a PO plans to decline without external review nevertheless be sent out for such review, provided that the PI agrees not to submit a further proposal for some period if the reviewers agree with the PO that the proposal is not fundable.
- POs and DDs should take care not to disadvantage particular groups of PIs; COVs could be asked to take a look at whether particular groups are being disadvantaged.
- Business systems could be augmented to track the number of times a PI is declined without the benefit of outside review and block excessive application of this to any one individual.

# Wiki-based reviews

**Idea:** A set of reviewers is assigned to a proposal. Each submits an independent written review. Once a reviewer has submitted his or her review, he/she can see the other written reviews and begin a discussion of the merits of the proposal with the other reviewers on a secure Wiki site. Reviewers' identities are hidden (using labels like Reviewer 1, Reviewer 2 etc.) At the end of a set period (e.g. one or two weeks) each reviewer submits a revised version of his or her review and the Wiki site is then locked. Both the original and revised reviews are retained, along with the Wiki discussion, and provide input to the Program Officer. A variation of this would include a Wiki discussion moderator. Another variation could be structured more like a panel: the reviewers would look at a set of proposals; reviewers would be able to see each other's identities; a scribe would be assigned for each proposal and would prepare a summary of the panel's asynchronous discussion.

## ***Potential Drawbacks***

- The Wiki discussion may get off track or a reviewer may make an inappropriate comment.
- Reviewers may not participate until last minute, leaving no time for discussion.

## ***Potential Benefits***

- Reduces the need for face to face panels or virtual panels while retaining some of the benefits of a discussion between reviewers.
- Set of reviewers can reflect the expertise needed for the specific proposal rather than having to be part of a panel that has to look at many different proposals.
- Reviewers can participate on their own schedule (the interaction is asynchronous).
- Can potentially tap a broader community of reviewers than real or virtual panels.
- Provides a record of the discussion between reviewers.

## ***Potential Mitigation Steps***

- Could experiment with moderating Wiki discussions. For example, if the process was used at scale by NSF, some staff may be appointed as NSF-wide or Directorate-wide Wiki moderators, e.g. on a rotating basis.
- A policy for redactions of Wiki discussions, analogous to the one for redacting reviews, could be developed.

# Increased use of virtual panels

**Idea:** More proposals could be reviewed by reviewers that discuss the proposals as a panel but do so via videoconference or teleconference rather than coming together in a single physical place.

## ***Potential Benefits***

- Potential broadening of reviewer pool.
- More fine-grained use of panels. (Small groups of proposals; greater tailoring of expertise to subject.)
- Reduced travel burden on reviewers.
- Ability to include *ad hoc* reviewers in discussions of specific proposals.
- Ability to enable principal investigators to answer questions from panelists in real time.

## ***Potential Drawbacks***

- Less effective panels, for reasons noted in the results of social science research on virtual teams.
- A less secure review process.
- Less opportunity for fostering networks within and across disciplines.
- Reduced technical support for reviewers.
- Higher incidence of disruptive technical problems.

## ***Potential Mitigation Steps***

- Mandatory one-day training for reviewers at NSF or other locations around country, good for several years.
- Mandatory on-line interactive training.
- Signed statement of agreement to comply with code of conduct: (e.g. confidentiality, conflict of interest, will not enable others to view or listen and will notify PO if suspects that this may have happened, will not leave discussion without agreement of panel moderator.)
- Greater use of standing virtual panels.
- Program Officer briefs the virtual panel online three or four weeks before the panel convenes and includes panel socialization; e.g. discussion of a few “dummy” proposals.
- Develop program officer training module on the management of virtual panels.
- Develop an on-call virtual panel technical support group within DIS.

# More use of preliminary proposals

**Idea:** Core programs where proposer and reviewer burden is highest and that routinely accept full proposals might experiment with requiring shorter, simpler preliminary proposals and only invite full proposals from those preliminary proposals that review well. Full proposals are reviewed in usual way.

**Version 1:** Obtain three ad hoc reviews of each preliminary proposal. Request full proposals only for those that have two positive reviews or that the program officer feels have potential.

**Version 2:** Have panel-only review of preliminary proposals. Request full proposals from highest xx%.

## ***Potential Drawbacks***

- Longer time from proposal of initial idea to final funding decision.
- Proposers may send multiple preliminary proposals per cycle, increasing workload.
- Possible lack of continuity between review of preliminary proposal and review of full proposal.

## ***Potential Benefits***

- Reduce burden on proposers. (Shorter, simpler preliminary proposals; only write a full proposal when more likelihood of success.)
- Reduce burden on reviewers. (Shorter simpler preliminary proposals and fewer full proposals to review; fewer reviewers per proposal for prelims.)
- Greater focus on key elements: intellectual merit and broader impacts.
- Proposers could send multiple preliminary proposals per cycle to see which strikes reviewers as most innovative.

## ***Potential Mitigation Steps***

- Monitor number of proposals per PI submitted each cycle. If unreasonable, introduce submission limit.
- Include reviewers of preliminary proposals in review of full proposals.
- Greater use of standing panels.

# Double-blind review

**Idea:** Separate proposals into two parts: (a) Project Description, References and Budget Description; (b) Summary, Results of Prior Support, Current and Pending, Bio Sketches, Standard Forms etc. Instruct PIs not to identify themselves or their institutions in part (a).

**Version 1:** Provide reviewers only with part (a). Program officers base recommendations on reviewer input, content of part (a), and PO's assessment of part (b).

**Version 2:** Use 2-stage review. In stage-1, reviewers look only a part (a). After initial reviews submitted, then look at part (b) and add separate statement about qualifications & resources.

## ***Potential Benefits***

- Reviewer focus is on merits of scientific idea, methodology, and impacts.
- Reduce bias towards more experienced PIs
- Reduce implicit bias effects associated with race, gender, etc.

## ***Potential Drawbacks***

- Difficult for reviewers to assess institutional role in Broader Impacts.
- More challenging (but not impossible) to describe synergies with existing efforts/programs that PI or Institution are involved with.
- PIs may put “clues” to their identity in the Project Description.
- Shifts responsibility for assessing, ‘How well qualified is the proposer,’ and ‘the quality of prior work.’ to the PO.

## ***Potential Mitigation Steps***

# Prioritization of possible merit review pilot activities

- Assign a score between 1 & 8 to each of the potential pilots.
- Use each number only once (e.g. don't give "1" to two ideas).
- 1 = like best; 8 = least important

Potential Pilot	Score
PI response to reviews prior to decision	
Return non-competitive proposals	
Wiki-based reviews	
Increased use of virtual panels	
More use of preliminary proposals	
Double-blind review	