NATIONAL SCIENCE FOUNDATION
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ALEXANDRIA, VIRGINIA 22314

NSF 22-103

Frequently Asked Questions (FAQs) on the Gen-4 Engineering Research Centers (ERC) Solicitation (NSF 22-580)

Please read the following important aspects of NSF 22-580 solicitation

Disclaimer: The guidance included in the ERC solicitation (NSF 22-580) overrides any conflicting information included in ERC materials located elsewhere, including this FAQ.

- Webinar: Slides and other materials are posted on the ERC Program Website:
- ERC PD Consultation: A limited number of consultation time slots will be available starting in July 2022 at this link.
- To volunteer as an ERC Reviewer, please send an email to nsferc@nsf.gov with "Reviewer" as the subject.
- The ERC Planning Grant competition is a separate competition, which should not be construed as a step towards an ERC proposal and is not required to submit a proposal to the NSF 22-580 competition.

GENERAL

1. When is the ERC solicitation webinar scheduled?

2. When will the awards announcement for ERC solicitation NSF 20-553 and feedback for those proposals in the current competition be made?

3. Is it possible to schedule a consultation with one of the ERC Program Directors?

4. Must the Lead PI of a preliminary proposal eventually be the Lead PI of the ERC full proposal?

5. Are there any targeted research areas of interest to the NSF in this solicitation?

6. What are some of the lessons learned from the current competition that could be used as guidance for this round of Gen-4 ERC proposals? Are there specific issues/weaknesses that you would recommend to the community to pay specific attention to?

7. Is there any priority to COVID-19 research topics?

8. To what extent are you looking for prior collaboration among team members?

9. What are the chief differences between ERCs and STCs or IUCRCs?

10. Should the ERC theme be driven by a major societal need or by a technology challenge or opportunity?

11. Can societal impact be global or only US?

12. How is convergence different from transdisciplinary or interdisciplinary approach?

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15. Can an NSF ERC include human clinical trials or animal testing and validation?

16. Does "diversity and inclusion" mean to involve multiple universities?

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18. What percentage of effort do you recommend be directed towards non-science and engineering disciplines?

19. Can you explain the ERC 3-plane strategic diagram?

20. How should we incorporate societal impacts into the 3-plane-diagram?

21. Does the workforce development component have to have an entrepreneurship program, or can this be defined by the PIs?

22. Should the workforce development evaluation include evidence of expanding the workforce, upskilling, or both?

23. Is there a benefit to include workforce development that includes well positioned and qualified tech colleges?

24. How important is it for the workforce development to span from K-12 through continuing education or can it be more focused on certain educational stage?

25. What is the ideal TRL range for ERCs?

26. Does the ERC program have common templates for partnership (university and/or industry) agreements, outlining policy/legal rights/responsibilities or does each center define its own agreement?

27. Do we need to submit a Postdoctoral Mentoring Plan?

28. Is the diagram in the Flexibility in Management slide only meant as an example, or should the management structure follow the outline in the diagram?

29. Will resources be provided for evaluators?

30. Do we need to submit letters of support from deans of institutions of non-lead PIs? Is there a limitation to the number of these letters?

31. Are there any defined documents (like the ones published by NAE) that provide definition of high risk/high payoff research approach that is acceptable to ERC?

ELIGIBILITY

32. Can an Authorized Organizational Representative (AOR) from a university submit a Letter of Intent (and subsequent preliminary proposal) from more than one PI at that university? Additionally, can a PI submit multiple Letters of Intent or preliminary proposals?

33. Can industry representatives serve as a Non-Lead PI?

34. Are there any limits on the number of preliminary proposals per PI and co-PI?

35. The solicitation states "Only U.S. universities that grant engineering degrees at the undergraduate, masters, and doctoral engineering level may submit proposals as the lead university." Does this requirement apply to partner universities?

36. Are there restrictions on number of partners such as universities and industry members?

37. With regards to the requirement that each ERC core partner institution have at least three faculty participating in the ERC, are there any requirements on the type of faculty appointment, e.g., tenure track faculty?

38. What qualifies as a minority-serving institution for the Gen-4 ERCs?

39. How does the Gen-4 ERC distinguish between the role of the ERC Lead PI and role of the ERC Center Director?

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55. What are the limits on international academic partner institutions?

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AWARD INFORMATION

60. What is the duration of an ERC award?

61. What is the estimated number of awards?

62. Can the contribution of the core Universities be monetary and/or in-kind too?

63. For the cost share, what is the % for cash and in-kind?

64. Is cost share required for Years 6-10 of the ERC life? It seems that the solicitation does not explicitly address that.

65. How does EPSCoR fit into this program?

66. What is the anticipated start date of the ERC?

PROPOSALS AND PROPOSAL SUBMISSION

67. For preliminary proposals, where should the proposing team table be located?

68. Can I use Research.gov, FastLane or Grants.gov for my proposal submission?

69. If companies and federal laboratories collaborate on the proposal, would their monetary contribution have to be included in the budget of the full proposal or should it be enumerated separately?

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71. What level of technical detail is expected in the 10-page preliminary proposal? A 30,000- foot view of the center or more detailed description?

72. Should we be writing the preliminary proposal as if the ERC will last for 10 years, or for the first 5-year period only? I understand that the cost share needs to be for 10 years but what about the vision?

73. What is the rationale behind not including the industry in the preliminary proposal, especially one is developing the ERC idea closely with the industry?

74. Should the project description contain the Results from Prior NSF Support?

75. Will separately submitted collaborative proposals be accepted for this competition?

76. Is the submission deadline flexible?

REVIEW PROCESS

77. Who will review the preliminary proposals? Will it be panels of our peers, or will it be managed by NSF itself?

78. How will the review panels be organized, give the broad spectrum of potential topics?

79. In your review process, how are you planning to balance between honoring COIs and getting the most qualified reviewers? Because of the reputation of this ERC program, almost all research-active universities would probably submit a proposal or be part of a proposal.

80. During the review of preliminary proposals are the reviewers all engineers or will it be composed of interdisciplinary reviewers for example engineers, sociologist, biologist, economist, etc.?

81. Do you anticipate conducting site visits and then the "Blue Ribbon Panel" review based on the top Full proposals before making a funding decision?

82. What is the anticipated timeline for announcement of decisions from Preliminary

Proposal reviews?

83. How are reviewers being prepared so that those who are familiar with pre-Gen-4 (as PIs and/or reviewers) are not evaluating new proposals according to the old standards/points of view? For example, I can imagine some pre-Gen-4 PIs will struggle with the culture of inclusion piece or the fact that a PI can be non-engineering or non-tenure track.

GENERAL

1. **When is the ERC solicitation webinar scheduled?**
   The ERC team recorded a webinar for broad dissemination. The webinar recording is at https://erc-assoc.org/ERCwebinar2022. The webinar reviewed the solicitation and addresses a broad range of questions for potential ERC PIs. A live Q&A session has been scheduled for Thursday, August 4 @ 12 PM ET and starts with the webinar, followed by live Q&A with ERC Program Directors.

2. **When will the awards announcement for ERC solicitation NSF 20-553 and feedback for those proposals in the current competition be made?**
   For proposals still active in the NSF 20-553 competition, all review materials will be released once awards are announced in Summer 2022. Awards for the NSF 22-580 competition will likely be announced in Summer 2024.

3. **Is it possible to schedule a consultation with one of the ERC Program Directors?** A limited number of consultation time slots will be available starting in July 2022 from this link.

4. **Must the Lead PI of a preliminary proposal eventually be the Lead PI of the ERC full proposal?**
   Not necessarily. It is the Lead University that is required to be in binding commitment throughout the ERC competition process and cannot be changed. It is up to the Lead University's discretion to select the Lead PI.

5. **Are there any targeted research areas of interest to the NSF in this solicitation?**
   No, there are no priority areas established for the Gen-4 ERC solicitation. However, the ERC program is placing greater emphasis on high-risk/high-payoff research that leads to societal impact, including convergent approaches, engaging stakeholder

communities, and strengthening team formation, in response to the National Academies (NASEM) 2017 study recommendations.

6. **What are some of the lessons learned from the current competition that could be used as guidance for this round of Gen-4 ERC proposals? Are there specific issues/weaknesses that you would recommend to the community to pay specific attention to?**

   The major lesson is that the PIs should pay close attention to the current solicitation. More specifically, those PIs that are familiar with the Gen-3 ERC program should understand the differences in the Gen-4 ERC. Even Gen-4 Solicitations can include minor changes from year to year.

7. **Is there any priority to COVID-19 research topics?**

   The ERC solicitation is completely open to topical areas and has no set priorities in that regard.

8. **To what extent are you looking for prior collaboration among team members?**

   Prior collaborations may indicate credible team appropriateness for the proposed project but should not be used as a substitute for the deep expertise necessary for achieving the convergence goals, nor strength across all four ERC foundational areas. Teams are advised to use team science to assemble their teams.

9. **What are the chief differences between ERCs and STCs or IUCRCs?**

   Appropriate solicitations such as NSF 22-580 (for ERC), NSF 22-521 (for STC) and the IUCRC website (https://iucrc.nsf.gov) explain the important features of each program.

10. **Should the ERC theme be driven by a major societal need or by a technology challenge or opportunity?**

    As stated in the solicitation, it should be driven by a significant societal need.

11. **Can societal impact be global or only US?**

    The ERC vision guides discovery and technology to uniquely transform US prosperity, health, and/or security in 10 years. The vision should describe the compelling new idea and how it relates to national needs. In this context, the vision can be either US-only or global if the best way to solve the problem is to address it from the context of the global community.

12. **How is convergence different from transdisciplinary or interdisciplinary approach?**

Convergence implies deep integration of disciplines, and the notion overlaps with transdisciplinary research approach. As stated in the solicitation: "ERC convergent research is a deeply collaborative and cross/transdisciplinary effort that results in positive societal impact. Convergence blends multiple disciplines in engineering, sciences and social sciences in a coordinated, interdependent way and fosters robust collaborations needed for successful inquiry." Also, the solicitation has a link to more detailed discussion about convergent research approach: A detailed explanation of the convergence concept can be found in a 2014 National Academies report, "Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering and Beyond" (https://www.nae.edu/113283.aspx).

13. **How do you provide evidence of trusted partnerships to NSF and review panel?**

    The evidence of trusted partnerships among the ERC PI team members is evaluated in the proposal, in the way the 4 foundational components of GEN-4 ERC and the participation institutions' integration are described in the proposal. Potential for trusted partnerships is evidenced by the terms of the industry membership agreements and intellectual property agreements. The leadership and management structure, organization and approach are also evidence of partnership, which can be informed by team science.

14. **Given that engineering is being redefined on many campuses, how prominent must engineering departments and faculty be in the proposed ERC?**

    As long as the lead institution can demonstrate that it grants engineering degrees at B.S., M.S., and Ph.D. levels, all proposals compete on equal footing.

15. **Can an NSF ERC include human clinical trials or animal testing and validation?**

    The ERC program seeks to fund Centers that provide unique value and do not replicate efforts supported by other federal agencies. **Early-stage human and animal studies** may be appropriate, but **clinical trials are typically not supported by NSF funds**. Please refer to NSF PAPPG for guidance regarding proposals involving vertebrate animals and proposals involving human subjects.

16. **Does "diversity and inclusion" mean to involve multiple universities?**

    Not necessarily. Diversity means the participation of people (Center students, faculty, researchers, staff, stakeholders, etc.) with diverse backgrounds including underrepresented groups (race, ethnicity, gender, people with disabilities, as well as first-generation students, rural areas, LGBTQ+, etc.). Culture of Inclusion means a philosophy in the Center that stimulates an environment in which all participants are welcome and there is mutual benefit for all participants. The participation of multiple

universities is addressed in the solicitation, including the requirement of at least one Minority-Serving Institution as Lead or Core Partner(s).

17. **Is there an implied value order for the areas of impact? In other words, is the impact on the Engineering Community more important than for the scientific community, and the societal impact the least important of the three.**

    It is up to the ERC team to make the case for the impact of the project.

18. **What percentage of effort do you recommend be directed towards non-science and engineering disciplines?**

    There are no set percentages. It is up to the ERC team to make the case in the proposal about the vision and plans for the 4 foundational components of the Gen-4 ERC, and how they will be integrated. ERCs should be driven by the defined engineered system, and all disciplines needed to address barriers.

19. **Can you explain the ERC 3-plane strategic diagram?**

    The ERC 3-plane diagram reflects the expectation that the Center will be driven by an engineered system based on overarching vision that aims to address a significant societal challenge.

    - The engineered system is represented at the top plane that includes proof-of-concept system level testbeds.
    - To enable the engineered system and the testbeds, technological advances will be required to overcome the barriers, and they are represented in the middle plane.
    - The technological advances will require leading edge use-inspired fundamental research that is represented in the bottom plane.

    A more comprehensive discussion can be found here: https://erc-assoc.org/content/strategic-planning-research-3-plane-chart

20. **How should we incorporate societal impacts into the 3-plane-diagram?**

    Given the societal impact that motivates the Gen-4 ERC, it is naturally reflected in the top plane. However, elements of societal impact may appear in the other planes as appropriate. For example, given that the societal impact is a driver, some projects may include ethics, policy, or social science research in the middle or bottom plane. ERC teams may modify the 3-plane chart to include key aspects of their proposed ERC beyond the framework provided.

21. **Does the workforce development component have to have an entrepreneurship program, or can this be defined by the PIs?**

Entrepreneurship training may be appropriate for Engineering Workforce Development and Innovation Ecosystem components of an ERC but are not required. This can be defined by the ERC team, consistent with the vision of the Center.

22. **Should the workforce development evaluation include evidence of expanding the workforce, upskilling, or both?**

    The purpose of ERC evaluation is to provide feedback on progress towards meeting Center's goals. It should be consistent with the vision of the Center.

23. **Is there a benefit to include workforce development that includes well positioned and qualified tech colleges?**

    A proposed evidence-based program for human capacity development for the future engineering and technical workforce must be described. It should be consistent with the vision of the Center.

24. **How important is it for the workforce development to span from K-12 through continuing education or can it be more focused on certain educational stage?**

    It should be consistent with the vision of the Center, and consistent with the goals of the ERC solicitation: "A proposed evidence-based program for human capacity development for the future engineering and technical workforce must be described."

25. **What is the ideal TRL range for ERCs?**

    The ERC's efforts are expected to be use-inspired basic research, rather than prescribed by TRLs.

26. **Does the ERC program have common templates for partnership (university and/or industry) agreements, outlining policy/legal rights/responsibilities or does each center define its own agreement?**

    Each Center defines its own agreement. ERC teams may refer to Best Practices for ERC Industrial Collaboration and Innovation: https://erc-assoc.org/content/chapter-5-industrial-collaboration-and-innovation

27. **Do we need to submit a Postdoctoral Mentoring Plan?**

    If the full proposal includes funding for post-docs, a postdoctoral mentoring plan is required.

28. **Is the diagram in the Flexibility in Management slide only meant as an example, or should the management structure follow the outline in the diagram?**

The management structure diagram is provided as an example, and it is flexible. However, the centers are required to include the Council of Deans, Student Leadership Council, and Advisory Board(s) as appropriate.

29. **Will resources be provided for evaluators?**

The evaluators should be supported from the ERC's budget. New ERCs will typically receive training on strategic planning, logic models, and ERC program required data collection and reporting.

30. **Do we need to submit letters of support from deans of institutions of non-lead PIs? Is there a limitation to the number of these letters?**

Yes, letters of commitment should be provided by the lead institution, core partner institutions, and any participating member organizations, following the guidelines in the Solicitation. (See the section "Letters" in the solicitation.) There is no limitation to the number of these letters.

31. **Are there any defined documents (like the ones published by NAE) that provide definition of high risk/high payoff research approach that is acceptable to ERC?**

NSF has a site that discusses "high-risk/high-payoff" or "potentially transformative" concept - see: https://www.nsf.gov/about/transformative_research/.

ELIGIBILITY

32. **Can an Authorized Organizational Representative (AOR) from a university submit a Letter of Intent (and subsequent preliminary proposal) from more than one PI at that university? Additionally, can a PI submit multiple Letters of Intent or preliminary proposals?**

Yes, both universities and PIs can submit more than one Letter of Intent (LOI) or preliminary proposal. Note, however, that the lead PI must be a faculty in the lead university.

33. **Can industry representatives serve as a Non-Lead PI?**

Yes.

34. **Are there any limits on the number of preliminary proposals per PI and co-PI?**

No. An individual may be listed as a PI or co-PI on multiple preliminary proposals

35. **The solicitation states "Only U.S. universities that grant engineering degrees at the undergraduate, masters, and doctoral engineering level may submit**

proposals as the lead university." Does this requirement apply to partner universities?

No, partner institutions are not required to grant such engineering degrees.

36. **Are there restrictions on number of partners such as universities and industry members?**

No. A proposed ERC must be multi-institutional, with a lead university and additional domestic university core partners. However, there is no limit on the number of partners.

37. **With regards to the requirement that each ERC core partner institution have at least three faculty participating in the ERC, are there any requirements on the type of faculty appointment, e.g., tenure track faculty?**

No, there are no requirements for the type of faculty appointment.

38. **What qualifies as a minority-serving institution for the Gen-4 ERCs?**

Minority Serving Institutions (MSIs) serve historically underrepresented racial or ethnic minority populations. US law under Title III of the Higher Education Act of 1965 defines seven categories of MSI. The proposal should provide evidence that leads to a reasonable determination that an institution meets this requirement.

39. **How does the Gen-4 ERC distinguish between the role of the ERC Lead PI and role of the ERC Center Director?**

It is up to each ERC team to determine what model of leadership will best meet the goals of the Center. The ERC Lead PI and Center Director may be filled by the same person or split among personnel. In instances where more than one person fills these roles, the ERC PIs will determine the responsibilities of the Center Director.

40. **Can an institution with a current ERC apply for the Gen-4 ERC grant?**

Yes, a university that leads a single ERC from Classes 2015-2022 is eligible to submit as a Lead university for this competition. Universities serving as lead for two active ERCs are not eligible to submit a proposal as the Lead Institution. There is no limitation to how often a university can participate as an ERC Core Partner.

41. **Are there any restrictions on the number of proposals one can submit as the lead institution?**

No, however, universities with two active ERCs are not eligible to submit a proposal as the Lead Institution. Universities with two active ERCs are not eligible to submit a proposal as the Lead Institution.

42. **Can ERC PIs be research professors?**

    The Lead PI must be a faculty member at the lead university. It is up to the university to decide whether a research professor can serve as a PI in an ERC proposal.

43. **Can the lead PI be an Adjunct Faculty at the lead institution?**

    See the previous response.

44. **Can there be two equal lead PIs?**

    No.

45. **In lieu of independent PhD program, can the lead university have Joint Doctoral Program with a partner university?**

    Yes.

46. **Is it preferred that the lead PI be a full professor?**

    There is no specific requirement. It is up to the ERC to make that decision.

47. **Is it necessary that the ERC Director and/or Lead PI be from an Engineering School?**

    No, they are required to be from lead university but no requirement to be from the engineering school of the lead university.

48. **Does the ERC Director have to hold a terminal degree?**

    There is no specific requirement.

49. **Can the ERC Director be hired specifically for that purpose, so would not be identified on the proposal?**

    Yes, the Director, if different from the Lead PI, can be named after the person is hired, post-award.

50. **Is there a difference between the ERC Director and ERC Administrative Director?**

    Yes. The role of the ERC Administrative Director is stated in the solicitation. The specific role of the ERC director is up to the proposing ERC PI team to define.

51. **Does the Administrative Director need to be a faculty member?**

    No. Typically the ERC Administrative Director is a full-time staff member that may be named at the time of award.

52. **Does everyone involved in the proposal have to be from a BS/MS/PhD institution?**

    If "Everyone" is narrowly interpreted as a faculty member, they can be from any eligible university as stated in the solicitation.

53. **Is there a limit on the number of PIs, or the number of PIs who are in engineering departments?**

    The number of PIs and co-PIs is limited by the number of names listed on the Cover Page, irrespective of department.

54. **While multiple letters of intent (LOI) can be submitted from the same institution, can there be multiple full proposal submissions from that same institution?**

    Yes.

55. **What are the limits on international academic partner institutions?**

    There is no limit.

56. **What is the ideal number of partner universities on a center proposal?**

    There is no prescribed number of partner universities.

57. **Can the title of the ERC be changed after the LOI is submitted, at the time of the preliminary submission?**

    Yes.

58. **Do previous planning grants preclude you from applying in this cycle?**

    No. This ERC competition and the planning grants are completely independent activities.

59. **If we are a finalist in the current competition, how will this impact our proposal in the next competition, particularly the preproposal phase?**

    There is absolutely no impact. These are independent competitions.

AWARD INFORMATION

60. **What is the duration of an ERC award?**

    ERCs generally operate for ten years, with an initial award for the first five years and a second award based on performance and satisfactory review of a renewal proposal.

61. **What is the estimated number of awards?**

    The ERC program plans to award up to 6 ERCs in the current competition NSF 22-580, subject to the availability of funds.

62. **Can the contribution of the core Universities be monetary and/or in-kind too?**

    Yes. Cost share of lead and core partner institutions can be monetary and/or in-kind.

63. **For the cost share, what is the % for cash and in-kind?**

    There is no prescribed split between cash and in-kind contributions to the cost-share.

64. **Is cost share required for Years 6-10 of the ERC life? It seems that the solicitation does not explicitly address that.**

    Yes. Cost sharing is required for the entire duration of the ERC. It is understood that the availability of financial resources may present significant challenges for committing to ERC cost sharing for some smaller universities and colleges and universities that do not have a high level of research activity. Therefore, the ERC cost sharing requirements are graduated and vary by the basic classification categories of universities and colleges defined by the "Carnegie Foundation's Classification of Institutions of Higher Education" as described in the solicitation.

Carnegie Foundation's Classification of Institutions of Higher Education*	Percentage required cost-sharing level of the allocation of the NSF budget to the lead or partner university/college**
RU/VH: Research Universities (very high research activity)	20%
RU/H: Research Universities (high research activity)	15%
DRU: Doctoral/Research Universities	10%
Master's L: Master's Colleges and Universities (larger programs)	10%
Bac/Diverse: Baccalaureate Colleges--Diverse Fields	5%

* If the university is classified in more than one Carnegie category, it must cost share at the highest cost sharing category as described above. In addition, the Carnegie classification that is to be used is the classification in place at the LOI submission deadline and will remain throughout the duration of the competition and a subsequent award.

Source: http://carnegieclassifications.iu.edu/

**The total ERC cost share shall be 20% or less, depending upon the Carnegie classifications for each of the partners.

65. **How does EPSCoR fit into this program?**

    The EPSCoR status does not affect the review of the ERC proposals.

66. **What is the anticipated start date of the ERC?**

    NSF expects to make the ERC awards in the summer of 2024 with an anticipated start date of September 1, 2024.

PROPOSALS AND PROPOSAL SUBMISSION

67. **For preliminary proposals, where should the proposing team table be located?**

    All preliminary proposals should include a table that includes all committed ERC personnel: (1) Name of the Lead PI (and ERC Director, if different from the Lead PI) and Non-Lead PIs, (2) Institution(s), (3) Department(s), (4) Most Relevant Field(s) of Expertise, and (5) all committed senior personnel. This table should be included as a Supplementary Document. The team table should include only those personnel who would receive NSF funds. Do not identify members of advisory boards.

68. **Can I use Research.gov, FastLane or Grants.gov for my proposal submission?**

    LOIs and preliminary proposals must be submitted through Research.gov (not Grants.gov). Invited full proposals must be submitted via Research.gov or Grants.gov. Submission via FastLane is not permitted.

69. **If companies and federal laboratories collaborate on the proposal, would their monetary contribution have to be included in the budget of the full proposal or**

should it be enumerated separately?

No, the ERC full proposal budget is only for the NSF funding. Note, however that voluntary cost sharing is not allowed. See cost sharing section in the solicitation for specific information.

70. **What documentation is required to submit in an ERC Preliminary proposal?**

    Refer to the NSF 22-580 for all required preliminary proposal sections. It is important to note that Biographical Sketches should only be included for PIs and Center Director and should not be included for Senior Personnel. Other typical sections of an NSF proposals that should not be submitted in a preliminary proposal include: Current and Pending Support, Facilities, Equipment, and Other Resources, Data Management Plan, Postdoctoral Mentoring Plan, Budget, and Budget Justification.

    Supplementary Documents should only include the proposing Team Table and the required letter from the Dean of Engineering at the Lead Institution.

    Single Copy Documents should only include COA information for all ERC personnel who would receive NSF funds, and ERC Preliminary Proposal Institutional Conflict information as described in the solicitation.

    DO NOT SUBMIT other documents, including Letters of Commitment or Collaboration from the domestic partner universities, prospective industrial members, or other future partners.

71. **What level of technical detail is expected in the 10-page preliminary proposal? A 30,000- foot view of the center or more detailed description?**

    At this stage of the competition, we are looking for ideas addressing an engineering challenge that has potential to be transformative if successful. With a 10-page limit on the preliminary proposal length, there is not enough space to provide sufficient technical details on a complex engineered system to allow the reviewers to evaluate its technical feasibility. In the solicitation, specific review criteria are listed, therefore the emphasis should be clearly defining an engineered system and giving sufficient detail to pique the curiosity of the reader/reviewer and compel an invitation for a full proposal submission. It is up to the PI to strike a balance between presentation of the vision and the 3-plane chart and including other important review criteria.

72. **Should we be writing the preliminary proposal as if the ERC will last for 10 years, or for the first 5-year period only? I understand that the cost share needs to be for 10 years but what about the vision?**

    The preliminary proposal should provide the vision for the entire 10 years of the center.

Since the budget is not requested at this stage, do not bring in cost-share etc.

73. **What is the rationale behind not including the industry in the preliminary proposal, especially one is developing the ERC idea closely with the industry?**

    At the preliminary proposal stage, reviewers on the panel cannot be affiliated with institutions involved in the competition. Industry is excluded from preliminary proposals to widen the pool of available reviewers by avoiding conflict of interest (COI). The preliminary proposal, limited to only 10 pages, should focus on the overall vision and plan. Details such as stakeholders, including industries, are required only in the full proposal.

74. **Should the project description contain the Results from Prior NSF Support?**

    "Results from Prior Support" is NOT a required section of the preliminary proposal. It is a required section for the full proposal and should follow the formatting in the NSF PAPPG Chapter II.C.2.d.iii.

75. **Will separately submitted collaborative proposals be accepted for this competition?**

    No.

76. **Is the submission deadline flexible?**

    No.

REVIEW PROCESS

77. **Who will review the preliminary proposals? Will it be panels of our peers, or will it be managed by NSF itself?**

    All proposals will be reviewed according to NSF's merit review process. All preliminary proposals will be reviewed by panels of experts. The members of a specific panel will be researchers, educators, and practitioners from the community outside the NSF, with relevant knowledge to evaluate the proposals assigned to that panel.

78. **How will the review panels be organized, give the broad spectrum of potential topics?**

    The proposals are clustered in groups (panels) with related topics, so that panel members can be brought in for a specific panel focused on thematic topic(s).

79. **In your review process, how are you planning to balance between honoring COIs and getting the most qualified reviewers? Because of the reputation of this ERC**

program, almost all research-active universities would probably submit a proposal or be part of a proposal.

NSF has been successful in recruiting qualified reviewers who are not conflicted. In every competition many research-intensive universities choose not to submit proposal(s) for a given competition. Reviewers are tapped from government and industry research labs and international reviewers may be brought in as necessary.

80. **During the review of preliminary proposals are the reviewers all engineers or will it be composed of interdisciplinary reviewers for example engineers, sociologist, biologist, economist, etc.?**

All appropriate and necessary experts are brought in reviewing all aspects of the proposal, including appropriate research expertise, workforce development, innovation ecosystem, and diversity and culture of inclusion. One should not assume that only engineers will be reviewing the proposals. Suggested reviewers may also be included as detailed in the NSF PAPPG Chapter II.C.1.b.

81. **Do you anticipate conducting site visits and then the "Blue Ribbon Panel" review based on the top Full proposals before making a funding decision?**

As indicated in the solicitation, the overall review process anticipates several review steps including panel reviews, site visits, and internal NSF processes.

82. **What is the anticipated timeline for announcement of decisions from Preliminary Proposal reviews?**

There is no set date to release the result of preliminary proposal reviews, but the NSF ERC program will ensure to provide adequate time to prepare full proposals.

83. **How are reviewers being prepared so that those who are familiar with pre-Gen-4 (as PIs and/or reviewers) are not evaluating new proposals according to the old standards/points of view? For example, I can imagine some pre-Gen-4 PIs will struggle with the culture of inclusion piece or the fact that a PI can be non-engineering or non-tenure track.**

The reviewers are prepared through webinars, dedicated training sessions, and explicit instructions to respond to solicitation specific review criteria so that they are in-tune with the expectations of Gen-4 ERC program (as reflected in the solicitation).