MEMORANDUM

DATE: February 20, 2004

TO: Fae Korsmo, OD/OIA

FROM: James Lightbourne, Senior Advisor

Directorate for Education and Human Resources

SUBJECT: COV for Program for **Persons with Disabilities** Program

COI and Diversity Memo

The Committee of Visitors report for the Persons with Disabilities (PPD) Program was approved at the EHR Advisory Committee meeting held at NSF on November 5-6, 2003. The COV consisted of four members selected for their expertise related to the goals of the program. They provided a balance with respect to the type of institutions supported through the program, gender, and representation from underrepresented groups. The following table shows the main features of the COV's diversity.

Member of EHR Advisory Committee	Chris Holle
Institution Type	
University	2
Four year college	X
Two year college	X
K-12	1
Industry	1
Federal Agency	X
Location	
East	3
Midwest	X
West Coast	1
Foreign	X
Gender	
Female	2
Male	2
Race/Ethnicity	
White	3
Black	X
Hispanic	X
Asian	X
Pacific Islander	X
American Indian	1

The COV was briefed on Conflict of Interest issues and each COV member completed a COI form. COV members had no conflicts with any of the proposals or files.

COMMITTEE OF VISITORS REPORT

to the

National Science Foundation

Visitation Dates: March 26, 27, 2003

PROGRAM FOR PERSONS WITH DISABILITIES

Division of Human Resources Directorate of Education and Human Resources

Committee of Visitors Members

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COMMITTEE OF VISITORS REPORT

March 26, 27, 2003
National Science Foundation
Program for Persons with Disabilities (PPD)
Division of Human Resources
Directorate of Education and Human Resources

OVERVIEW

This report responds to the National Science Foundation's (NSF) call to the Committee of Visitors (COV) to review the foundation's awards management efforts during the past three year period under its Program for Person with Disabilities (PPD), and to guide the program's next steps into the years that follow. Accordingly, the COV met on March 26, 27, 2003 to examine the awards review and management information related to the PPD for the years 2000, 2001, and 2002. The Acting Program Director, Dr. James Powlik, was interviewed during this period providing additional information to answer questions and requests. Well in advance of the meeting, Dr. Powlik provided a comprehensive set of materials to the panel that included annual and final reports, site visit summaries, program solicitations, reports and articles related to PPD, and a 50 page summary of PPD that included everything from awards and declinations summary spreadsheets to exemplary outcomes of awarded proposals. Provided as well was data breakdown in terms of geographic locations, reviewers and reviewer expertise, institutions involved, disabilities represented, and more. Dr Powlik is to be commended for providing the panel with this extensive array of background materials and for the information he provided during the two days of review.

The Program for Persons with Disabilities was begun in 1991 and has so far made 96 awards to projects in 30 states and the District of Columbia with a total disbursement of \$43,426,107. There has been an average of 9.3 awards per year with an average amount of \$433.254 of about 2.7 years in duration. Since 1994 the Program for Persons with Disabilities has served to:

- Promote the accessibility and appropriateness of instructional materials and learning technologies,
- Increase the availability of mentoring resources,
- Increase the awareness and recognition of the need and capabilities of students with disabilities, and
- Develop and test innovative techniques of teaching science and mathematics that are appropriate for all students.

Historically, PPD awards fall into four main categories: Research and Development, Demonstration, and Enrichment, Institutionalization of Experimental Projects, and Information Dissemination.

In the FY (Fiscal Year) 2000, there were 18 awards (out of 41 full proposals and 11 supplemental and other proposals submitted to the program) with a total award of \$6,226,114 and a mean award of \$389,132. In 2001 PPD initiated support for the *Regional Alliance for Persons with Disabilities in STEM Education* (PPD-RAD) based on the NSF model successfully

employed by the Louis Stokes Alliances for Minority Participation (LSAMP) and other factors based on previous PPD project performance and outcomes. Such alliances have multiple goals for people with disabilities that involve including STEM (Science, Technology, Engineering, and Mathematics) courses at all levels, improving availability of science enrichment, increasing access to appropriate instructional materials, fostering positive attitudes from teachers and professionals, creating bridging programs, providing drop-in STEM tutorial centers, implementing STEM summer internships, adapting STEM curricula, using effective methods of teaching, and employing disabled scientists as mentors. Among eight full and twelve other (Supplemental, etc.) proposals submitted to the program, a multiyear PPD-RAD was funded in FY 2001for \$3,995,383. There was only one other award in for a negligible amount.

In FY 2002 PPD initiated the *Focused Research Initiative* (PPD-FRI) intended to develop focused assisted technologies to help persons with disabilities participate in STEM careers, to build tools to be quickly utilized in educational environments, and to add value to the educational cycle in STEM education for disabled students. In the same year, a program track called *Dissemination, Enrichment, and Information Dissemination* (PPD-DEI) also began. The PPD-DEI proposals were intended to further institutionalize products and other educational materials to promote accessibility to STEM disciplines and career experiences by students with disabilities; enhance the STEM learning experience for students with disabilities; and to disseminate information about model programs, exceptional products, successful research methods, and proven educational practices to a broad national audience. During FY 2002 there were four awards (4 awards out of 27 full proposals or 31 total proposals) including a multiyear PPD-RAD for \$3,995,383. The three other awards totaled \$311,043.

The charge to the Committee of Visitors (COV) was to: (A) Evaluate the integrity and efficiency of program management – how well did the program manage its award granting and supporting activities? (B) Evaluate the program's results – how well did the program perform to meet its objectives? and (C) Advise NSF about any needed improvement in managing the program and ways to better meet the program needs.

More specifically, the COV was asked to review and examine a sample of awards and declinations from FY 2000 through FY 2002 and provide a balanced assessment of PPD's performance regarding: (A) the integrity and efficiency of the processes related to proposal review, and (B) the quality of the results of NSF's investments in the form of outcomes and outputs over time. Part A was further divided into sections that asked questions about (1) The quality and effectiveness of merit review procedures, (2) The implementation of the merit review criteria by reviewers and program officers, (3) The selection of reviewers, (4) The resulting portfolio of awards, and (5) the management of the PPD. Part B asked questions about (1) outcome goals for people, (2) outcome goals for ideas, and (3) outcome goals for tools.

FINDINGS

PART A. INTEGRITY AND EFFICIENCE OF THE PROGRAM'S PROCESSES AND MANAGEMENT

A-1 Quality and Effectiveness of Merit Review Procedures

- The COV reviewed 10 active awards, 2 closed awards, and 20 declinations. There was evidence of a minimum of three reviews for each of the smaller proposals and five reviews for RAD proposals using the merit review criteria. The criteria used for evaluation purposes were appropriate and useful to the reviewer.
- The process is efficient, fair, and effective on the whole, but implementation over the three-year period has been impacted by the lack of consistent staffing at the Program Director and Program Assistant positions.
- The time line for review and informing prospective PIs is appropriate, but its implementation is unpredictable because of delays of Congress in approving an annual budget as well as other factors. Lapses in assigned program support staff over this three-year period yielded "dwell" times as long as 12 months in 2000, improving to 3 months with consistent staffing in 2001 and 2002.
- With the establishment of Regional Alliances, monitoring should be such that the COV can be assured that the goals have been achieved, and that each alliance proposal has a plan for institutionalizing the program once NSF funds end. Review procedures should take institutionalization into account.
- The review process should established relationships between the Regional Alliances and the other projects funded under this program to ensure that the benefits from these projects are incorporated and replicated. A possible suggestion in the review process is to make replication and/or dissemination of the results of smaller funded projects part of the mission of the Regional Alliances.
- review criteria (intellectual merit and broader impact) along with a statement that for PPD proposals that "the value of Criterion 2 (broad impact) may meet or exceed Criterion 1 (intellectual merit), so it is crucial that this portion of PPD proposals be complete and as specific as is reasonable for the proposed scope of work." In addition there are separate criteria for the *Regional Alliances for Persons with Disabilities* (PPD-RAD); *Dissemination, Enrichment and Information* (PPD-DEI); and Focused Research Initiatives (PPD-FRI); as well as the year 2000 proposals. The response form that is used in judging each of the proposals does allow reviewers an opportunity to address these and other areas of concern and strength, but does not reflect the weight that they gave to the subset of criteria within "intellectual merit" and "broader impacts." The evaluation of the individual criteria for RAD, DEI, FRI, and others could be determined within each

section of "intellectual merit" and "broader impact" evaluations, but the weight given to each could not be easily determined. Therefore, it is difficult to determine what weight the reviewers gave to each criterion in coming to their final decision.

- Verbatim, but anonymous, reviewers' comments are provided back to the principal investigators. More constructive feedback is needed for the unsuccessful proposals.
- Panel summaries provided sufficient information for the principal investigator(s) to understand the basis for the panel recommendation incorporation with the individual reviews. The give and take discussion on the panel is a strength of the process.
- The recommendations for funding appear to be well justified, but similar reviews have led to different funding decisions. It is assumed that this occurs because only a small number of proposals could be funded. Increased funding would resolve these borderline decisions. The increased needs of persons with disabilities and the need for a broad portfolio described in A.4 are additional strong reasons for increased funding.
- The value of proposals and the potential outcomes should not be criterion that is subordinate to criteria related to prior funding of a PI.

A.2 Implementation of NSF Merit Review Criteria by reviewers and program officers.

- Recognizing diversity of the types of programs reviewed by NSF, it appears to be difficult for a particular program to give equal weight to each merit review criteria.
- Individual, panel, and review analyses (Form 7s) appear well focused and complete. As described above, it is difficult to determine the weight given to the merit review criteria and the weight given to the criteria of different types of PPD proposals.

A.3 Selection of reviewers

- The program used a minimum of three reviewers for each of the smaller proposal and a minimum of five reviewers for RAD proposals. The reviewers have sufficient expertise in the field of science and mathematics.
- There appears to be under-representation of persons with disabilities and persons with expertise in the field of education and rehabilitation of persons with disabilities. Those disabilities represented appeared to be motor and vision impairments only. Use of people with expertise in a specific disability targeted by a proposal is encouraged.
- In discussing recognition and resolution of conflicts of interest with program staff, there is a mechanism for minimizing and avoiding such occurrences.

A.4 Portfolio of awards under review

- The funded projects are of outstanding quality. A few appeared comparable to some that were declined but that may not have been funded due to other factors such as available funding.
- The PPD should have a balanced portfolio in terms of types of projects, types of disabilities and age of targeted group. There also should be balanced funding between the DEIs and FRIs and RADs, allowing many small grants to deal with the unique needs of the people with disabilities. These smaller grants should become starting points for further investigation and use by RADs. There have been only four new awards other than RADs in the past two years and the COV does not consider that a positive trend. With the sizable investment that is being made in the Regional Alliances, appropriate monitoring needs to take place to assure that the investment has been adequately utilized and has not been made at the peril of investment in many smaller projects of potentially greater value. The development of target benchmarks and achievement of those benchmarks should be part of the evaluation process.
- Funding of Regional Alliances should not be done to the extent that it hinders funding of smaller, more innovative ideas.
- With the large investment in Regional Alliances, an appropriate mechanism should be in place to ensure that benchmarks have been achieved.
- It is the impression of the COV that risk of individual proposals is dependent upon several factors including the experience of the proposer, the extent of the task, an unexplored new direction, and adequacy of budget. It is difficult to discern whether or not evaluations were predicated on any or all of these risk factors. Although good, solid replication and dissemination of best practices was evident, little cutting-edge research was apparent
- There appears to be a balance of projects in the science and technology field. Mathematics is a bit underrepresented but not excessively.
- Pre-college schools systems, individuals, and foundations appeared to be
 underrepresented, but colleges and community colleges were well represented, both as
 funding recipients and as focuses of research. The program should have a balanced
 portfolio providing opportunities for participation by various types of institutions and the
 opportunity to address the needs of the various types of disabilities that are associated
 with this program.
- Attitudes for success in science and mathematics are established at the elementary level.
 We would recommend more focus on funding to benefit children with disabilities at the
 elementary and middle school levels. We would encourage the establishment of a
 Regional Alliance that focuses on the elementary school students with disabilities. Most
 PPD proposals are for less than three years. Efforts to enhance STEM opportunities for

elementary (and middle school) students will not show increased enrollment in advanced math and science in high school or in STEM enrollment in college during such a short time frame. This may be the cause of the dearth of elementary proposals. Other indicators of success should be established such as performance on measures of science and math achievement in elementary and middle school - as well as participation in after school and informal science experiences. The multiyear RADs seems to be the area that can address this area of concern.

- Focus on research and evaluations appear to be weak in the proposals and may be related to how the Program Announcements and Solicitations are written or the emphasis they impart. There should be a stronger emphasis on research and/or evaluated outcomes, through both formative and summative processes.
- Funding is responsive to national priorities, agency mission, and relevant fields. It is recommended that persons with disabilities and those that serve them have a voice in determination of responsiveness to their needs such as participation on advisory committees as recommended in Section A.5. Many outcomes have the added benefit of helping the able-bodies as well.
- To ensure responsiveness to national priorities, the COV would like to see validation and recommendations related to outcomes of innovative ideas and programs.
- All Program Announcements and Solicitations within HRD should include a component
 that incorporates needs and concerns for persons with disabilities. Just as all PPD includes
 minorities so should proposals to increase minority participation in STEM include a
 component related to persons with disabilities.

A.5 Management of program under review

- Under the leadership of Larry Scadden, a well-organized management was developed. This involved a Senior Program Director, a Program Director, and a shared Program Assistant or Intern. Since that time, it appears that the program has lost some of its focus and become diluted. Processes appear to be in place but leadership was notably absent. There is strong evidence that the program is currently righting itself through Dr. James Powlik's intervention
- The COV believes that the program needs both a Program Director and at least a part-time Program Assistant. Without a Program Assistant, the workload is impossibly high, which, over time will erode effective implementation. <u>It is important that the Program Director</u> <u>position is filled as soon as possible to ensure that the momentum of the program</u> <u>continues.</u>
- The research component of this program appears to be limited. There is a greater focus on application and dissemination of successful practice than on the creation of educational trends or emerging or innovative research.

- There should be clear and guiding statements in the Program Announcements and Solicitations that require respondents to incorporate evaluation systems and expected outcomes (benchmarks) in their proposals. Reports should focus on achievements relative to evaluation criteria established in these proposals. PIs should be informed at the outset of funding of any other expectations or standards to which they will be held by the PPD.
- The PPD should have an Advisory Committee that meets on an annual basis to assist the staff in establishing program priorities and the review of the outcomes from investments in the past.
- The COV recommends a formal summative analysis be conducted of the utilization of funds across outcomes of the various projects to learn what works and does not in order to establish best practices and guide replication prior to the next convening of the Committee of Visitors. The summary of projects and project outcomes by Dr. James Powlik represents a step in the right direction.
- The COV believes that the program is under-funded based upon the need to increase the numbers of persons with disabilities pursuing STEM and because of the number of quality proposals that have not been funded. The need for increased funding is also related to the need for a Program Assistant.
- The Fastlane should be made totally accessible such that all persons with disabilities have
 equal access with regards to proposal submissions, proposal review, and the submission
 of reports on funded projects. This is particularly an issue for persons with visual
 impairments and persons with hearing impairments who are ASL, rather than English,
 users.
- To state once again as a management priority, it is important for the PPD to have a balanced portfolio to ensure that opportunities continue to exist for innovation regarding educational strategies and the use of technology. With the majority of the program funds being devoted to Regional Alliances, these opportunities have been diminished. By having a more balanced portfolio, the Program would increase the likelihood that research and dissemination activities would lead to the innovations that could initiate new alliances or could be included in continuing alliances.

PART B. RESULTS: OUTPUTS AND OUTCOMES OF NSF INVESTMENTS

The COV believes that all three types of outcomes envisaged by NSF, i.e., People, Ideas and Tools are important. Given its special focus on human resources development, it is conceivable that PPD identifies its results with the People goal. Both its direct beneficiaries (educators and other service providers) as well as its ultimate beneficiaries (persons with disabilities) are people. However, transforming people and developing "a diverse, internationally competitive and globally engaged workforce of scientists, engineers, and well-prepared citizens" is a long-term result, and often implies step by step achievement, requiring a tool or an idea to be developed first as intermediate/instrumental outcomes. Ouite

often it requires follow-up of results beyond the funding period. It is therefore fair and realistic to expect tools and ideas as legitimate outputs and outcomes from NSF investments in PPD, as long as they are directed towards, and have a strong **potential** for, impacts on people.

The COV reviewed the **eight** annual reports and **two** site reports related to the **ten** awards that were selected for the review. Most of these projects initially addressed a "tool" goal, but impressive efforts were made by the projects to take the results to the next level of impacting "people". The potential to change people through **training and development** as well as through **outreach** was present in all projects. For example:

- The Clearinghouse on STEM from the Rochester Institute of Technology (# 0095948; PI-Lang) achieved a "tool goal" in year one, developing a comprehensive information base. This has led to "people outcome" with teacher educators requesting training and technical assistance in curriculum development and offering to field-test the webbased workshops. Again, the "tool goal" for year two, the field-tested material, has potential to train teacher educators that establish network for systemic reform.
- The project at the U of Western Michigan (# 0099229; PI- Leneway) achieved its tool outcome in year one by setting up and testing the EDITU/Smart force infrastructure. The actual use by persons with disabilities that followed and requests for online seminars show the beginnings of "people" outcome. The findings on lessons learned, the perception of an emerging "model for next generation workforce life long learning" suggests an "idea" outcome, again with potential to transform people. Further, the outreach activities such as corporate contacts and involvement in policy building efforts to create inclusive workforce demonstrate efforts headed towards impacting people.
- The PPD: CD-ROM ACCESS Project at the WGBH Edu Foundation (9623958; PI-Goldberg) is a demonstrated effort to make multimedia math and science accessible to students who are blind and visually impaired students. The long-term goal of this project is "inclusive" classrooms. Its significant "tool" achievement is its "design guidelines" for accessible software. Its initial "people" impacts include increasing hits at the website. Among its notable efforts for "people" outcomes are its outreach to software developers, purchasing organizations, and the project coordinator being honored as the Blind Employee of the Year in Massachusetts. Direction of impact also includes penetration of the Guidelines into the National Association of the State Directors of Special Education and into Software and Industry Association's educational market division.
- RASEM2 at the New Mexico State University (# 0124198; PI- McCarthy) is one of two multi-year investments by NSF in this review period. The project is a successful transition from RASEM. In reviewing its first year site report, there is evidence that contacts and building partner relations were the main focus in Year One. In this sense it is the initial "people awareness" goal. Although attitude changes on campus appear to have resulted from the previous cycle of funding, some initial challenges were also

noted, especially in getting the partners to be fully vested in the program through placing their own students in the program. The COV agrees with the site reporters' recommendations that the project should play more of an ambassador role with other RAD sites, be more aggressive self-advocates and package "what works" and disseminate effective practices from the first cycle.

AccessSTEM, at the University of Washington (# 0227995; PI- Burgstahler), is the other multi-year RAD project of NSF funding. This is built on the success of its predecessor, the DO-IT project. Besides access to internet and computer connections ("tools" goals) the project appears to have fostered a broad based community support for the "ideas" that it pioneered - parent involvement, peer instruction, eased transition, hands-on research, student self-advocacy, and the like. It thus combines individual student-need-fulfillment with effective dissemination to the community. Noteworthy "people" outcomes include student self-esteem and development. In terms of quantitative outcomes, 89% of 158 program graduates went on to college, 70% of these into STEM. Replicability of a successful project such as this is of special interest, and the project intends to "incorporate the lessons learned from DO-IT to disseminate to other States". The COV agrees with the site reporters that the project is in a unique position to disseminate its effective practices and advise researchers on applications of focused research in the classroom. While it is commendable that it has produced a wealth of qualitative experiences, more effort to set up and test research-based questions would be useful.

Evidence from the review of the documents above appears to concur with the exemplary project outcomes, products and advances in teaching and testing practices summarized in the material (Vol I, pp. 38-43) made available to the COV. They suggest that the outputs and outcomes of NSF investment in the PPD are headed in the right direction – the transformation of people working for and with students with disabilities and the enhancement of their competence needed to achieve, ultimately, an inclusive, well-prepared workforce and citizenry. Thus, although most projects seem "tool" oriented in terms of their explicit goals, it is commendable that they have gone beyond these goals to achieve "people" results through one-on-one, small group, and community interactions that produce an intangible but effective "impact" on individuals. Follow-up tracking of impacts from successful projects is therefore very important. In particular, formal documentation of impacts accruing as rich qualitative data is urged so they support and strengthen the "people" results currently recorded and formalized in quantitative terms. The measure of such impacts is difficult (and expensive) but could relate strongly the establishment of best practices recommended in the section below.

COMMENDATIONS AND RECOMMENDATIONS

The Committee of Visitors believes that the Program for Persons with Disabilities is an endeavor of critical importance. The integrity and efficiency of the process related to merit review are excellent. The variety of proposals that have been funded has led to expanded opportunities for people with disabilities to pursue STEM education and careers. The PPD proposal outcomes provide multiple pathways to STEM education and career success for students with disabilities

because of the tools, educational support, mentoring, instructional materials, teaching, professional development and so much more that has increased access. The COV would like to commend Dr. James Powlik for his many contributions as Acting Program Director. The Committee of Visitors would like to make the following recommendations:

- There should be an increased inclusion of reviewers with expertise in rehabilitation and education of persons with disabilities.
- The PPD must have increased funding based on the need to increase the number of person with disability in STEM education and careers and because of quality proposals not funded.
- The PPD must have both a Program Director and Program Assistant if the needs of the program are to be met.
- The Program Director position needs to be filled as soon as possible to maintain the momentum of the program.
- The PPD should have a balanced portfolio of the types of projects, types of disabilities, and ages of targeted groups
- With the establishment of alliances, monitoring should be such that there is an assurance that the goals have been achieved and that the alliances have a plan for institutionalizing the program once NSF funds end.
- An alliance that focuses on elementary school students with disabilities should be funded.
- There must be an established relationship among the Regional Alliances and the other projects funded (FRIs and DEIs) to ensure that the benefits and outcomes of the smaller programs are incorporated and replicated in the larger, more comprehensive alliances.
- The PPD should establish an Advisory Committee that meets once a year to assist in developing program priorities and in reviewing products and outcomes from investments in the past.
- There should be clear and guiding statements in the Program Announcements and Solicitations that require proposals to include evaluation systems and measures of expected outcomes. Annual and final reports should focus on the achievement of identified goals, objectives, and benchmarks. PIs should be informed at the outset of the evaluation criteria or any other standard to which they will be held.
- There should be an increased research focus in Program Announcements and Solicitations.

- All Program Announcements and Solicitations within HRD should include a component that incorporates the needs of persons with disabilities.
- There should be a formal summative analysis of the utilization of funds across outcomes of the various projects to learn what works and does not in order to establish best practices and guide replication prior to the next convening of the Committee of Visitors.
- Fastlane should be made totally accessible so that all persons with disabilities have equal access to proposal submission, proposal review, and the submission of required reports. This is particularly an issue for persons with visual impairment who are ASL, rather than English users.
- The PI meeting and the COV should meet on consecutive or overlapping days so that a more complete communication of project goals, objectives, outcomes, and products can be achieved. Direct communication is more likely to communicate the heart and soul of a project.

It is also recommended that the inclusion of Research in Disabilities Education (RDE), a program structure and research plan for the next iteration of the PPD, proposed by James Powlik be seriously considered by the PPD and any established Advisory Committee for future Program Announcements and Solicitations. The interplay between the research DEI's, FRIs, and RADs seems about right. This proposal model calls for a number of diverse research DEIs. A second higher level of funding supports fewer research FRIs. These research FRIs will be based on meritorious DEIs or on projects intended for research RAD implementation. The highly funded research RADs incorporate meritorious research FRIs and other projects for national networking and infrastructure dissemination and for feedback on critical issues to the research community. The Committee of Visitors believes that the funding for each of these proposal levels needs to be examined carefully so that the nested interplay of the proposals can have the intended multiplier effect at the RAD level and so that the experience at the RAD level can effectively inform needed areas for future DEI and FRI proposals.

A FINAL NOTE

The recommendations made by the Committee of Visitors should in no way detract from the excellence of proposals reviewed or the integrity and efficiency of the proposal review and award process for the Program for Persons with Disabilities. It is to National Science Foundation's credit that it seeks the opinions of diverse professionals and experts. This openness to informed analysis will strengthen the PPD over time.