

Report to the  
Nuclear Science Advisory Committee

Submitted by the Committee of Visitors  
to the Office of Nuclear Physics Program  
Office of Science  
Department of Energy

February 27, 2004

## Table of Contents

Executive Summary .....	3
1. Introduction.....	5
2. Effectiveness, Efficiency, and Quality of the Programs’ Processes and Management.....	6
2.1 Merit review procedures .....	6
2.2 Reviewer selection .....	7
2.3 Monitoring program and active research projects .....	9
2.4 Monitoring facility operations .....	11
2.5 Establishing and monitoring equipment fabrication projects .....	13
3. Outcome of the Program’s Processes and Management.....	15
3.1 Resulting breadth and depth of portfolio awards.....	15
3.2 National and international standing of portfolio of awards .....	15
3.3 Opportunities for process improvement.....	17
Appendix A – Panel Members .....	20
Appendix B – Agenda.....	22
Appendix C – Charges to NSAC and to COV .....	24
Appendix D – Response to OMB Questions .....	27

## **Executive Summary**

The Committee of Visitors (COV) for the Office of Nuclear Physics (ONP) was formed as a subcommittee of the Nuclear Sciences Advisory Committee (NSAC). It met for two days on December 11-12, 2003. The meeting included a set of presentations by the associate director and his deputy on the programs in the office and various statistical information on these programs. The COV members each studied several folders containing information on the proposals received and acted upon. The number and choice of folders viewed by the COV represented an excellent cross-section of those received by the ONP. The proposals funded were consistent with the programmatic priorities. The on-line input of the program managers during the meeting was an essential element in the review process.

The COV's major finding is that the ONP carries out its duties in an exemplary manner. The program greatly benefits from the dedication and detailed knowledge that each program manager brings to his or her portfolio management. Keeping up this expert knowledge requires that the program officers regularly visit grantees in their home laboratories. The COV considers these site visits to be extremely valuable. Meetings between the program managers and university administrators serve to keep a high profile for nuclear physics within academic institutions. The COV strongly recommends that an additional 20% in travel funds be allocated to ensure these visits continue.

The COV finds that the ONP operates in a very efficient and cohesive manner. The COV does suggest a number of minor operational changes which may benefit the program managers and reviewers in carrying out their tasks more efficiently. These could in some cases decrease the amount of effort put into reports and proposals by the grantees. First, the COV suggests consideration of the implementation of an annual deadline for new proposals. This would help the program managers in budget preparation and grantees because all proposals would be considered early in the budget cycle. Effective support for new proposals and emerging opportunities requires available re-allocatable funds at the ONP. While the committee supports a program that serves to motivate the program officers to closer interaction and communication with the research community it suggests that greater flexibility between the needs of the various parts of the program might better be ensured by having a greater fraction of these funds handled by the Associate Director's office.

The COV further suggests that the program managers generate a comprehensive database of reviewers that includes more members of the international community. This may improve the review process, ensure a broader diversity amongst referees

and identify those referees who are being over utilized. While the COV did not find any cases of conflict of interest amongst the assigned referees it does recommend that the ONP include a formal conflict of interest statement in the letter of request sent to reviewers.

Grant applications appear to come in many different forms and lengths, and it is not always simple to find the information needed to assess progress. The committee recommends that a uniform reporting format for progress reports be implemented. The essential information should be in a mandatory format allowing ease of access to it.

The laboratory Field Work Proposals (FWPs) represent a substantial investment in time by the laboratories. While these may be useful to the laboratories in setting budget priorities some questions were raised about the utility of the FWPs as a planning tool for the nuclear physics program managers. Further discussion between the laboratories and the ONP might find more efficient processes to meet their respective needs. The COV also suggests that formal workforce development assessment be included in the science and technology reviews of the major laboratories.

The COV finds that the quality and the diversity of science supported by the ONP are outstanding in large part due to the stable funding of nuclear physics research achieved by the ONP. This also reflects the excellent long term planning process leading to a 5-year plan through interaction of the ONP with the nuclear physics community. This has proven to be extremely successful over the last two decades. This approach has also made nuclear physics into one of the most dynamic and successful research communities and has led US nuclear physics to current world leadership in the fields of medium energy and heavy ion physics and with plans underway that will achieve the same status for science using radioactive beams.

Finally the COV makes some comments on the processes of this review and makes some suggestions for making the next review even more efficient. Material from the report that pertains to the four questions posed by the office of Management and Budget is collected in Appendix D. The COV thanks all of the staff of the ONP for their help and hospitality throughout this review.

## **1. Introduction**

The Committee of Visitors (COV) for the Office of Nuclear Physics (ONP) program was formed as a subcommittee of the Nuclear Sciences Advisory Committee (NSAC). It met for two days on December 11-12, 2003 to review actions taken on funding of university groups, major projects and laboratory operations handled by the Office during the years 2001, 2002 and 2003. It also reviewed the impact of these decisions on the quality and competitiveness of the nuclear physics program in an international context. Appendix A contains a list of COV members and Appendix B the agenda. Appendix C contains the charge given to the subcommittee by NSAC and the original charge to NSAC from DOE and NSF. The COV was asked in particular to comment on the effectiveness, efficiency and quality of the program's processes and management, outcomes of the program's processes and management, future directions of the program and opportunities for process improvement. Finally, the committee was asked to respond directly to four questions submitted by the Office of Management and Budget (OMB). These responses are included as appendix D.

Prior to the meeting, members of the COV were provided with the nuclear physics program mission as included in the FY 2004 congressional budget submission, a list of 677 actions which were processed in the past 3 years, and a list of folders and comments on those folders selected as representative by the program managers.

As shown in the attached agenda the meeting began on the first morning with a set of presentations by the Associate Director and his deputy on the programs in the Office of Nuclear Physics (ONP) and various statistical information relating to them. During the late morning and afternoon of the first day the COV members split into four groups to study folders containing information on the proposals received and acted upon. The COV enjoyed full access to any folder desired, and appreciates this openness. The on-line input of the program managers was deemed to be of great value in expediting the business of the COV. Each COV member studied about 25 folders and most of the folders were viewed by several members of the COV. These folders covered a broad range of diverse situations including large laboratory operations, large project oversight, small laboratory research efforts, terminating grants, declinations, grants to doctoral/research universities, 4-year colleges and to HBCUs, EPSCOR grants and also outstanding young junior investigator grants. Among them were cases which the program managers considered to be straightforward, while others presented special challenges.

On the second morning the COV reviewed, discussed, and combined the findings of the various working groups. It next presented these initial findings for further discussion with the ONP staff. The committee then met in camera again to formulate its findings, which were discussed in the afternoon first with the Associate Director and then in a “close-out” session with the program managers. Following the COV meeting, the COV completed and made final revisions to its report. The revised report was sent to all COV members for approval before submission to NSAC.

The Committee wishes to thank the administrative support staff of the ONP for its help and hospitality throughout this review. We would also like to express appreciation to the Associate Director and the program managers for frank discussions of their own work and that of the ONP. The COV was greatly impressed by the competence, enthusiasm and dedication that we observed throughout the Office. It is clear that the Office benefits greatly from the strong personal interest and expertise of the Associate Director and the program managers.

## **2. Effectiveness, Efficiency, and Quality of the Programs’ Processes and Management**

### **2.1 Merit review procedures**

- a) Appropriateness of review mechanism (panels, ad hoc reviews, site visits)

The COV’s overall impression is that the nuclear science program uses the available merit review mechanisms appropriately to assess proposals for financial assistance and major items of equipment. The program greatly benefits from the detailed knowledge that each program manager has developed for his or her part of the portfolio. Keeping this expert knowledge requires the sustained ability of the program officer to visit grantees in their home laboratories. The COV considers these site visits to be extremely valuable. When a comprehensive view of the whole portfolio is required, review panels comparing multiple proposals can be of advantage as compared to mail reviews of individual proposals.

b) Timeliness of decision

Decisions on proposal folders reviewed were with one exception made within the recommended 6-month period provided by 10 CFR 605.10(a); the COV found that all proposals were responded to within the limit of 12 months. The committee notes the problem faced by program managers who would like to fund new proposals submitted early on in the budget year without knowing what funds are available until all renewal proposals have been received. The COV therefore suggests that the implementation of an annual deadline for new proposals. This will equally benefit proposers and program managers.

c) Completeness of documentation

The decision-making process used by program officers is well documented in the folders reviewed for financial assistance and major items of equipment.

d) Consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines

The proposals funded were consistent with the programmatic priorities. We encourage the program management to informally announce to the nuclear science community, in particular to young scientists, that the call for proposals has appeared in the federal register. This might, for example, be announced annually in the APS Division of Nuclear Physics newsletter or at DNP townhall meetings.

## **2.2 Reviewer selection**

The ONP funding covers a very broad range that includes large user facilities, university-based laboratories, and university and national laboratory research groups. Different review processes are used for the different components of the program.

a) Financial assistance agreements

For the proposals from university and laboratory-based research groups, the COV noted that there were typically 5 or 6 reviewers per proposal. This is an appropriate number that allows for a range of viewpoints and minimizes potential conflicts of interest. The reviewers chosen were experts in the particular sub-field of the proposals and were well qualified to judge the science

and technical aspects. The committee discussed whether inclusion of referees from areas outside of the specific subfield might provide a broader perspective on the science. The COV also considered, but were not inclined to recommend, changing procedures such as the panel-review process that the National Science Foundation uses for their base program. However, the panel-style review used for targeted solicitations such as the OJI program and the RIA research and development proposals was deemed appropriate.

Generally it was thought that efforts to generate a larger database of reviewers that included more members of the international community would improve the review process and ensure a broader diversity among referees. This database might also be used to keep track of those referees who are being utilized, and could help overcome the natural tendency for the most responsive referees to be over-used. The NSF process could be emulated by asking for referee suggestions as part of all financial request submissions and entering these into a database.

Conflicts of interest seemed to be rare, and those that did occur appear to have been skillfully dealt with by the project managers. On the other hand, no formal set of guidelines is given to referees for identifying potential conflicts of interest. We recommend that the office include a formal conflict of interest statement in the letter of request sent to reviewers.

The smaller university-based user facilities are reviewed with a site visit by program managers and peer consultants. This gives the program managers an opportunity to hear from many members of the program, including postdocs and students, which is very valuable in evaluating the scientific and educational impacts of the program. The committee believes that this is an important review component.

b) National laboratories

In the annual science and technology reviews of the major user facilities, consultant committees included a good mix of experts that cover the spectrum of laboratory operations, scientific users, theorists and laboratory managers, including members of the international community. Selection of panel members is done through consultation between the laboratories and the program managers, and in some instances the Chair of the laboratory's Program Advisory Committee is asked to sit on the committee. This provides an important link between the laboratory-approved science program and DOE funding priorities.



The reviews of the other national laboratory programs have in the past taken place through on-site program manager briefings. While both the laboratories and the program managers find the visits to the laboratory to be a very effective feedback mechanism, these visits have not in the past involved external peer consultants nor written recommendations. The ONP has decided to include outside consultants in the future; the COV endorses this change.

## **2.3 Monitoring program and active research projects**

The ONP conducts many different types of reviews to monitor the performance of its various national laboratory, university programs and projects.

For the national laboratories, program reviews are held annually at the two major ONP facilities: RHIC at Brookhaven, and CEBAF at Thomas Jefferson. Program manager briefings are held annually at the other national laboratory facilities: ATLAS at Argonne, 88-Inch Cyclotron at Lawrence Berkeley, and HRIBF at Oak Ridge. Briefings differ from reviews in that there is not typically a detailed written follow-up, and outside specialists are not involved. Project reviews and program manager briefings are held as necessary for efforts at Los Alamos and Lawrence Livermore. All seven laboratories submit detailed Field Work Proposals(FWPs) annually. Facility operation reviews, distinct from program reviews, are held on an as-needed basis. RHIC, TJNAF, and HRIBF, for example, were evaluated in FY2002. Facility reviews are discussed in more detail in Section 2.4 of this report.

The university laboratory facilities at Yale, Washington, Texas A and M, and Duke/TUNL are reviewed by outside visiting committees on a three-year cycle. Other university grants are typically monitored without site visits, utilizing mail reviews to assess performance at the time of renewal. All university grantees submit continuation progress reports in the second and third years. Program managers monitor these reports internally, and site visits rarely occur unless significant problems are noted.

The committee examined documentation relating to all these types of review. Some comments follow:

### **a) Grant progress reports**

These came in many different forms and lengths, and it was not always simple to find the information needed to assess progress. The committee recommends that a uniform reporting format for continuation progress reports, benefitting program

managers and grantees alike, be implemented. The format might well vary between the different programs. It suggests that a short report, containing all of the essential information needed, be in a mandatory format and that additional optional material be relegated to appendices. The committee did not develop a specific template but rather suggests that the program managers themselves develop it.

b) Laboratory Field Work Proposals (FWPs)

These are extremely detailed and represent a substantial investment in time by laboratory personnel. They are the primary mechanism for setting budget priorities at each laboratory and as such represent important planning documents. While they do provide for the budget briefings which occur later at DOE headquarters, there were some questions raised about the utility of the FWPs as a planning tool for the nuclear physics program managers.

c) Annual science and technology reviews of user facilities

These have been of great value at RHIC and TJNAF, and there are plans to implement similar reviews at HRIBF and ATLAS. The COV endorses expanding the reviews but cautions that, compared to technological progress, scientific progress cannot always be guaranteed on a yearly cycle. Reviewers will need to be sensitive to these different time scales for achieving results. We do, however, endorse the 4-year cycle for review of the full program in each of the four primary research areas: low energy, medium energy, heavy ion, and theory.

d) Program manager briefings

These occur at laboratory sites and are considered to be of great value by program managers in understanding in detail how a facility operates. The COV considers these to be a cost effective way of monitoring program performance. Close-out summaries by the managers would be helpful for the laboratory directors, and records from these would also be helpful in ensuring continuity following staff changes at DOE.

e) Visits to ongoing laboratory projects and university groups

The committee would like to see more opportunities for visits to university groups, and not only when projects or groups appear to be in trouble. Meetings between the program managers and university administrators (Department Heads, Deans, Vice Chancellors for research etc.) will serve to keep a high

profile for nuclear physics within academic institutions. This is an important aspect of workforce development since a lack of faculty positions for nuclear physics will automatically lead to a decrease in the number of students and postdocs with the skills needed to maintain US preeminence in nuclear science.

f) Attendance at topical and national meetings

These are very valuable for keeping program managers professionally current. They also allow managers to meet with large numbers of university grant recipients in a cost-effective way. The effectiveness of the US nuclear physics program rests in large measure on the competence of the present personnel, and on the professional respect that the US nuclear physics community has for them. The committee is strongly opposed to a system in which the program managers are not experts in their field, but are instead managers who rely solely on outside consultants for technical and scientific advice.

g) Travel

An overall concern of the committee is that inadequate travel money is being allocated to the program managers within the Nuclear Physics program. As noted above, this is essential for adequate monitoring of research grants. It is also important that the program monitors attend the major meetings in nuclear physics, in part because this is where information about the various initiatives of the Nuclear Physics program are efficiently and broadly communicated, and in part because the high quality of the program management is maintained by having program managers who are well informed about the most recent developments in the field. A 20% increase in travel funds is deemed by the COV to be essential to enhance the efficiency of the Office of Nuclear Program processes.

## **2.4 Monitoring facility operations**

a) Effectiveness of annual science and technology reviews of user facilities

The ONP Program uses a number of different reviews and briefings to monitor laboratory research and operations. The two large flagship user facilities, TJNAF and RHIC, are reviewed annually via science and technology reviews regulated by the Federal Advisory Committee Act (FACA). They use outside experts with sufficient knowledge of the facilities to give the ONP and the laboratories critical advice, as well as to address concerns (from either party)

arising during the review. Each reviewer provides written findings in response to the charge. The ONP uses these comments to form an executive summary, which is usually not seen by the reviewers. Thus, the report belongs to DOE (under FACA). The COV is pleased to note that during the period covered by this review, these executive summaries have become more focused in specifying recommendations that the reviewed laboratory is expected to respond to. It is further noted that the ONP has, on occasion, withheld funding until the recommendations have been followed. The COV evaluated the composition of the S&T committees and found that the selection of members was diverse and composed of appropriate elements (e.g., accelerator operations, accelerator theory, experimental and theoretical nuclear scientists, facility users, associated PAC member(s) and international representatives).

In summary, the COV finds that the annual reviews do clarify the issues facing the user facilities and contribute to addressing problems and bring about needed changes. The COV has two recommendations with respect to these reviews:

- Review the user facilities less often, since the research activities frequently receive additional reviews during the year.
- Continue to highlight recommendations in the review reports, both for clarity to the laboratory reviewed and for following review committees to validate responsiveness.

b) Quality of operational reviews of user facilities for effectiveness in operation

The ONP has also taken the initiative in organizing ad-hoc operational reviews, which address issues similar to those brought up at the budget briefings (see below), but bring in outside expert reviewers to advise the ONP. These reviews are documented with reports and are structured around the questions of how to increase the scientific output of the facility and how to attain the appropriate level of funding. The COV finds that these reviews have been effective in helping the ONP understand funding issues and establish a basis for funding.

c) Adequacy of program manager briefings

The smaller laboratory programs (ANL, LANL, LBNL, and ORNL) are reviewed using program manager briefings, which serve a similar function as the S&T reviews at the larger laboratories. In general, these involve the (appropriate) ONP managers and do not use outside reviewers. The reports given by the laboratory are thorough and the briefings typically take about two days. The COV finds that these briefings allow for in-depth discussions of

individual scientists' research projects and may provide more time for direct dialog on issues. However, the COV could not find a record of these briefings or any tracking of written findings or recommendations. The ONP reported that they plan to have S&T reviews at these laboratories, including outside reviewers and written reports. The COV supports this plan and recommends that it be done in two phases. Firstly, document all briefings and associated recommendations, as done presently for the S&T reviews. In full implementation, outside reviewers could be used.

Several other briefings and reviews are employed by the ONP. Prior to the annual spring ONP retreat, which helps form a basis for their contribution to the DOE out-year budgeting process, each facility is asked to present a budget briefing. This briefing is given to the ONP Associate Director and program managers. The COV was provided with examples of the material presented at one of these budget briefings and found that it is thorough, detailed and clearly provides useful laboratory input, supplementing the annual FWP submission.

Two final comments are appropriate for this section. Firstly, the COV suggests that formal workforce development assessment at the laboratories be included in S&T reviews. This is important to the laboratories since their long-term research productivity is critically dependent on training and promotion of new staff, as well as succession planning for management turnover within the laboratory. At the laboratories, and indeed at Universities, a natural focus for promotion would be on postdoctoral researchers and junior scientific staff. Assessment tools that might be used include the number and quality of talks given at conferences and workshops, access by the junior staff within the laboratory to activities that give them exposure to new research opportunities, and promotion and career tracking of the postdoctoral and younger staff. We note that tracking of workforce diversity would naturally fit into this category. Finally, and as mentioned previously, the review process, critical to the ONP program's success, requires appropriate resources within its office—adequate people, time and travel budget.

## **2.5 Establishing and monitoring equipment fabrication projects**

### **a) Appropriateness of project initiation and selection**

In FY 2004 the capital equipment budget is approximately \$23 million, of which \$14 million is for facility base projects and \$9 million is for competitive research projects. Of this \$9 million, approximately \$2 million is held in reserve by the program manager for utilization throughout the year. This reserve fund is

utilized for project issues or funding research efforts within the nuclear physics program. Also, in FY 2004 the approximate funding level for AIP is \$6.4 million, GPE is \$4.4 million, and GPP is \$6.5 million.

Project selection is supportive of the Office of Nuclear Program mission based upon the four project files reviewed and discussions with the program manager. There is an iterative process that is followed prior to the budget process (pre-proposal submission) which helps to support the priority needs of the institution and DOE. When necessary the program office will utilize the Nuclear Science Advisory Committee (NSAC) to support selection and justification of the projects.

The initiation process appears to be excellent and complies with DOE Order 413.3.

b) Adequacy of project definition

The projects reviewed were adequately defined through project management documentation, which defined the scope, cost and technical baselines in a graded approach.

c) Effectiveness of monitoring project execution

The level of knowledge expressed by the program manager and the documentation reviewed would indicate that the projects are well monitored at the appropriate level. The project definition appeared to be adequate to monitor the project's progress, which allowed for management attention when needed.

Program monitoring of projects appears to be very effective: when necessary program management has provided skillful guidance to help lead the project towards a successful conclusion. The program manager must be involved but authority/responsibility of the project/laboratory staff must not be compromised. The committee concluded that the program manager has recognized this balance and has been an excellent facilitator. This should be viewed as an essential process for a successful project.

d) Completeness and quality of documentation

Documentation of the project folders appears to be complete. The quality of the information about each project was good. However a "summary of contents" page would have been helpful at the beginning of each folder so that a rapid review of the project's progress and status could be completed.

### **3. Outcome of the Program's Processes and Management**

#### **3.1 Resulting breadth and depth of portfolio awards**

The quality and the diversity of science supported by the nuclear physics program within the office of science are outstanding. Given the tightness of funding, the program officers have made commendable and heroic efforts to provide adequate, stable funding of the broad dispersion of nuclear physics research. The committee noted that one place where funding continues to be extremely tight is for nuclear theory. The Outstanding Junior Investigator grants have provided a very successful and effective mechanism for supporting new high quality young nuclear physicists.

The combination of peer review for university grants and review panels for national laboratory efforts is an appropriate way of assessing the quality of the various research efforts, when combined with site visits by program managers. The site visits are particularly important for identifying less active researchers and ensuring that funds are available for more active and new researchers. This is a very difficult part of monitoring grants and involves understanding and cooperation with the grantees and their institutions. These are almost impossible to accomplish without a site visit. The COV believes that the amount of money which is being turned over by decreasing support from less active researchers and used to fund more active and new researchers is about right, but consideration could be given to decreasing the initial individual program managers' budgets to create a larger reserve which could be reallocated for emergencies and other high priority needs if necessary.

#### **3.2 National and international standing of portfolio of awards**

- a) Effectiveness of planning process for identification of most promising research opportunities

The ONP planning process for identifying new and promising research opportunities and directions is guided through strong, informal communication and interaction with the nuclear physics community. The fact that all of the program managers are experts in the field and have active nuclear physics research experience facilitates easy communication between the ONP and the various research groups, and allows quick identification of new research directions. This communication is further strengthened through attendance of program managers at conferences and workshops. The latter is important

because it allows the program managers to meet with younger members of the nuclear physics community.

On a more formal level the ONP planning process is guided through the advice and interaction with NSAC and the long-range planning processes of the nuclear physics community. This complementary approach of identifying new research directions and opportunities through close communication with the forefront research groups, reviewing and solidifying the information base and potential scientific impact of these developments through NSAC and NSAC sub-committees, and defining future directions through town meetings leading to a 5 year long range plan (LRP) has proven to be extremely successful over the last two decades. This approach offers flexibility in the field and in the funding procedure, maintaining broad support and consensus within the community, and it has also made nuclear physics one of the most dynamic and successful research communities, resulting in the development and construction of world-class research facilities such as JLab and RHIC.

b) Overall quality of science relative to international efforts

The COV finds that the ONP stewardship has led US nuclear physics to world leadership in the field of medium energy and heavy ion physics. In particular, the efforts which went into the construction and operation of JLAB and RHIC over the last decade now provide research opportunities which cannot be matched yet by other facilities. These successes clearly demonstrate the quality and effectiveness of the long range planning process through the ONP.

The proposed Rare Isotope Accelerator (RIA) facility that has been identified in the 2001 LRP as highest priority for future new development projects would ensure US world leadership in low energy nuclear physics and nuclear astrophysics for years to come. The ONP is effectively managing the transition to the RIA era through programmatic actions. The approval of Critical Decision 0 (CD-0, Statement of Mission Need) for RIA is the first step to world leadership in this area.

In weak interaction/neutrino physics the US is actively involved, but mainly concentrates its efforts on participating – sometimes in a leading role – at international facilities or research collaborations such as SNO in Canada, Gran Sasso in Italy or KamLAND and Super-Kamiokande in Japan. These collaborative efforts are supported by the Office of Nuclear Physics to ensure a strong role and visibility of the US nuclear physics community.



In summary, the ONP leadership, working closely with the Nuclear Physics community has enabled the US to attain world leadership in some areas and to excel in all areas of nuclear physics.

c) Effective support for emerging grant opportunities

Efficient support for new emerging opportunities requires readily available funds at the ONP. It has been estimated by the committee that a 5-8% fraction of the annual university grant budget should be sufficient to address these needs. Presently the responsibility for obtaining this fraction lies mainly with the program managers. Under the currently flat funding scenario these funds are typically available in the 5-8% range due to “natural” reduction, termination or declination of existing grants based on the reviews. In addition, both the Associate Director as well as the program managers maintain reserve funds, which are available at their discretion for supporting emerging opportunities. While the committee supports a program that serves to motivate the program managers to closer interaction and communication with the research community, it suggests that greater flexibility between the needs of the various parts of the program might be better ensured by having a greater fraction of the reserve funds handled by the Associate Director’s office.

### **3.3 Opportunities for process improvement**

a) Areas that worked effectively

The COV found it useful to have the list of all grants and to have this list separated by research area. This gave a good overview of the breadth and scale of the work supported. It was also useful to have an explanation of the review process, both for the first year and for the 2<sup>nd</sup> and 3<sup>rd</sup> continuing-year briefer reviews. This helped focus attention on the importance of the initial year in setting direction both for the grantee and the DOE. The entire review depended upon having examples of new, continuing, easy, declining, terminating, and declined proposals. This made side-by-side comparisons possible. Knowing the national program context was then key to understanding the relative ratings given to different proposals.

A crucial step in maximizing the efficiency of the committee deliberations was having the program managers available to explain the folder content, the significance of various forms, and the federally mandated steps in reviews. This clarified the procedure quickly, as otherwise each reading group would have had to discern this independently. It also helped to have an explanation of the budget

preparation process used by the office and the role of program managers in developing a program for their own areas, plus a discussion of how the overall office then considers the program as a whole.

The discussion of the importance of field visits, in allowing a program manager to grasp the status of a grant and evaluate a group's contribution, helped focus the COV on recommending that adequate travel funds be provided to the office staff. It helps to have attention drawn to areas where the office feels improvement is possible, so that the committee has enough time to discuss.

Finally, the discussion at the outset regarding DOE's mission approach and the various contracting and grant relationships and how they differ for national laboratories and universities, helped focus a committee drawn from disparate backgrounds on a common understanding of what they would be reviewing.

b) Areas needing improvement

This is given as a list of specific items which the office might do to help future committees with their review.

It would help to have a grant index showing shift of scope or emphasis of the proposers (e.g., two grantees at TAMU recently moved to RHIC), as this takes a while to deduce from the folders.

It was not clear how overall funding allocations among the major areas are made, e.g. between heavy-ion and medium energy, or among theory, low-energy and heavy-ion, to give some arbitrary combinations. If some discussion of this is possible during the opening session, it might focus committee discussion as to why some grants are turned down and others are accepted and even increased. Along these same lines, it was not clear how a new grant is developed and what "free energy" the program officers have to consider new proposals. Some explanation, perhaps using an historical example, would help the committee to understand this. Additionally, it was also only partially clear how decisions are made to increase or decrease given grants – how much is driven by individual requests and how much is driven by overall program goals for the area. Perhaps a discussion of the factors a program officer might consider in making these decisions would be useful to the next committee.

An overall "tracking" page kept at the beginning of a folder might help a reviewer understand the status of a given grant more quickly.

It might help to learn ahead of time of some of the more technical tools ONP uses; it was somewhat difficult to absorb all this in one morning. Similarly, describing ahead of time to COV the required reporting from the Office to OMB, Congress, etc., might help prepare the committee about the mechanics before arrival so that more time could be spent on the folders.

## Appendix A – Panel Members

Office of Nuclear Physics  
Committee of Visitors  
Panel Members

Professor John Cameron, Chairman  
Director  
Indiana University Cyclotron Facility  
2401 Milo B. Sampson Lane  
Bloomington, IN 47405  
Phone: 812-855-9407  
Fax: 812-855-6645  
Email: [cameron@iucf.indiana.edu](mailto:cameron@iucf.indiana.edu)

Professor Thomas Glasmacher  
National Superconducting  
Cyclotron Laboratory  
Michigan State University  
East Lansing, MI 48824-1321  
Phone: 517-333-6418  
Fax: 517-353-5967  
Email: [glasmacher@nscl.msu.edu](mailto:glasmacher@nscl.msu.edu)

Professor Christopher R. Gould  
Physics Department  
North Carolina State University  
Box 8202  
Raleigh, NC 27695-8202  
Phone: 919-515-2522  
Fax: 919-515-6538  
Email: [chris\\_gould@ncsu.edu](mailto:chris_gould@ncsu.edu)

Professor Akif Baha Balantekin  
Department of Physics  
University of Wisconsin  
115 University Avenue  
Madison, WI 53706  
Phone: 608-263-7931  
Fax: 608-263-8628  
Email: [baha@nucth.physics.wisc.edu](mailto:baha@nucth.physics.wisc.edu)

Professor Michael C. T. Wiescher  
Department of Physics  
University of Notre Dame  
225 Nieuwland Hall  
Notre Dame, IN 46556  
Phone: 219-631-6788  
Fax: 219-631-5952  
Email: [Michael.C.Wiescher.1@nd.edu](mailto:Michael.C.Wiescher.1@nd.edu)

Professor Elizabeth Beise  
Department of Physics  
University of Maryland  
College Park, MD 20742  
Phone: 301-405-6109  
Fax: 301-405-8558  
Email: [beise@physics.umd.edu](mailto:beise@physics.umd.edu)

Dr. Dennis M. Skopik  
Physics Division, MS: 12-H  
Thomas Jefferson National  
Accelerator Facility  
12000 Jefferson Avenue  
Newport News, VA 23606  
Phone: 757-269-7740  
Fax: 757-269-5800  
Email: [skopik@jlab.org](mailto:skopik@jlab.org)

Dr. Glenn R. Young, Director  
Physics Division  
Oak Ridge National Laboratory  
P. O. Box 2008  
Oak Ridge, TN 37831-2822  
Phone: 865-574-4772  
Fax: 865-576-8746  
Email: [younggr@ornl.gov](mailto:younggr@ornl.gov)

Dr. Larry D. McLerran  
 Physics Department, MS: 510A  
 Brookhaven National Laboratory  
 Upton, NY 11973-5000  
 Phone: 631-344-8294  
 Fax: 631-344-7561  
 Email: [mclerran@bnl.gov](mailto:mclerran@bnl.gov)

Mr. Ronald J. Lutha  
 NuMI Project Director  
 U.S. Department of Energy  
 Fermi Area Office  
 Box 2000  
 Batavia, IL 60510  
 Phone: 630-840-8130  
 Fax: 630-840-3285  
 Email: [ronald.lutha@ch.doe.gov](mailto:ronald.lutha@ch.doe.gov)

Professor Alan Shotter, Director  
 TRIUMF  
 4004 Wesbrook Mall  
 Vancouver, BC V6T 2A3  
 Phone: 604-222-7353  
 Fax: 604-222-3791  
 Email: [ashotter@triumf.ca](mailto:ashotter@triumf.ca)

Dr. Rodney E. Gerig  
 Advanced Photon Source Division  
 Argonne National Laboratory  
 9700 South Cass Avenue  
 Argonne, IL 60439  
 Phone: 630-252-5710  
 Fax: 630-252-7369  
 Email: [rod@aps.anl.gov](mailto:rod@aps.anl.gov)

Dr. Thomas Ludlam  
 Physics Department  
 Bldg. 510F  
 Brookhaven National Laboratory  
 Upton, NY 11973  
 Phone: 631-344-7753  
 Fax: 631-344-5820  
 Email: [ludlam@bnl.gov](mailto:ludlam@bnl.gov)

Dr. Lee Schroeder  
 Nuclear Sciences Division  
 Lawrence Berkeley Laboratory  
 MS 70R319  
 1 Cyclotron Rd.  
 Berkeley, CA 94720  
 Phone: 510-486-7890  
 Fax: 510-486-4818  
 Email: [lsschroeder@lbl.gov](mailto:lsschroeder@lbl.gov)

Professor Dr. Thomas Walcher  
 Institut fuer Kernphysik  
 Universitaet Mainz  
 J. J. Becher-Weg 45  
 D-55099 Mainz, Germany  
 Phone: 49 6131 39 25196  
 Fax: 49 6131 39 23825  
 Email: [walcher@kph.uni-mainz.de](mailto:walcher@kph.uni-mainz.de)

Dr. Richard F. Casten, ex-officio  
 A. W. Wright Nuclear Structure Laboratory  
 Yale University  
 New Haven, CT 06520  
 Phone: 203-432-6174  
 Fax: 203-432-3522  
 Email: [rick@riviera.physics.yale.edu](mailto:rick@riviera.physics.yale.edu)

## Appendix B – Agenda

Committee of Visitors for Office of Nuclear Physics  
DOE Headquarters, Germantown, MD

### AGENDA

Thursday, December 11, 2003 (Room E-301)

8:00 am Pickup from Hampton Inn  
 8:30 am Welcome/Executive session  
 9:00 am Office of Nuclear Physics Overview Dennis Kovar  
 9:45 am Characteristics of University Grants Stephen Steadman  
 10:05 am Executive session  
  
 10:35 am Break  
  
 11:00 am First grouping of reviewers:  

<u>Grants 1A</u>	<u>Grants 2A</u>	<u>Lab Res/OpsA</u>	<u>ProjectsA</u>
<u>(E-401)</u>	<u>(E-401)</u>	<u>(H-412)</u>	<u>(G-436)</u>
Glasmacher	<b>Gould</b>	Balantekin	Skopik
McLerran	Young	Gerig	<b>Lutha</b>
<b>Ludlam</b>	Schroeder	<b>Beise</b>	Wiescher
Casten	Cameron	Walcher	Shotter
OSNP STAFF ATTENDEES			
Henry	Tippens	Rai	Simon-Gillo
Coon	Steadman	Steadman	Hawkins

  
 12:30 pm Lunch G-207  
  
 1:15 pm Continue reading of folders  
  
 2:30 pm Break G-207  
  
 2:50pm Second grouping of reviewers:  

<u>Grants 1B</u>	<u>Grants 2B</u>	<u>Lab Research/OpsB</u>	<u>ProjectsB</u>
<u>(E-401)</u>	<u>(E-401)</u>	<u>(H-412)</u>	<u>(G-436)</u>
Balantekin	Skopik	Lutha	Gerig
Beise	<b>Wiescher</b>	Cameron	Walcher
Casten	Shotter	<b>Schroeder</b>	Ludlam
<b>Young</b>	McLerran	Gould	<b>Glasmacher</b>
OSNP STAFF ATTENDEES			
Tippens	Coon	Henry	Simon-Gillo
Rai	Steadman	Steadman	Hawkins

5:30 pm Executive session E-401  
6:30 pm Adjourn

7:30 pm Dinner at Hampton Inn

Friday, December 12, 2003 (Room E-301)

8:00 am Pickup from Hampton Inn

8:30 am Executive session

9:00 am Merge comments/Additional reading  
E-301, E-114, H-412

10:00 am Break G-207

10:30 am Additional reading/ discussion with program managers

12:30 pm Lunch G-207

1:15 pm Executive session E-301

3:15 pm Discussion with Associate Director

4:00 pm Closeout

5:00 pm Adjourn

## Appendix C – Charges to NSAC and to COV

*U.S. Department of Energy  
and the  
National Science Foundation*

September 12, 2003

Professor Richard Casten  
Chairman  
DOE/NSF Nuclear Science Advisory Committee  
A.W. Wright Nuclear Structure Laboratory  
Yale University  
New Haven, CT 06520

Dear Professor Casten:

This letter requests that the DOE/NSF Nuclear Science Advisory Committee (NSAC) establish a Committee of Visitors to assess the operations of the DOE Office of Science Nuclear Physics program, and provide guidance regarding performance measures for the Nuclear Physics program of the Office of Science.

- (1) NSAC is requested to establish a Committee of Visitors (COV) that can provide an assessment of process-related matters pertaining to the management of the Office of Science Nuclear Physics program. The COV should review the program management of the Nuclear Physics program to provide an assessment of the effectiveness, efficiency and quality of the processes used to solicit, review, recommend, and document proposal actions and monitor active projects and programs. In addition, the COV should also comment on how the award process has affected the breadth and depth of the Nuclear Physics portfolio elements, and the national and international standing of the Nuclear Physics program. Such an assessment is planned to be requested every three years. You should work with the Associate Director of the Office of Science for Nuclear Physics to establish the processes and procedures so as to enable the first COV to meet before the end of the 2003 calendar year. A report by the COV should be submitted by February 27, 2004.
- (2) NSAC is requested to provide an assessment and recommendations to the Office of Science regarding performance measures for the Nuclear Physics program. The performance measures are intended to focus on outcomes and meaningfully reflect the purpose of the program, to guide program management and budgeting, and to promote results and accountability. Office of Management and Budget (OMB) guidance for these measures and



the proposed Nuclear Physics measures are given in the enclosure. Assessments of progress towards meeting the goals are to be made every five years and some appropriate milestones have been requested by OMB to judge the quality of progress that has been made. NSAC is requested to submit a report with comments on the appropriateness of these measures, that these measures are suitably ambitious and validly encompass the DOE Nuclear Physics program, and with recommendations for appropriate milestones for each of these measures. Your report should be submitted before the end of November 2003.

We appreciate NSAC's willingness to take on these important activities, and we look forward to learning of your progress in these important tasks.

Sincerely,  
Raymond L Orbach  
Office of Science

John B. Hunt  
Acting Associate Director for  
Mathematical and Physical Sciences

Dear John,

As you know, the DOE and the NSF, through Ray Orbach, Director of the Office of Science at DOE, and John Hunt, then Acting Assistant Director for the Division of Mathematical and Physical Sciences at the NSF, have charged NSAC to establish a Committee of Visitors (COV) to assess matters relating to the processes used by the Nuclear Physics Program Office in managing the Nuclear Physics program of the Office of Science. The charge asks for an assessment of the effectiveness, efficiency, and quality of these processes and how they have affected the scope of the resulting program and its national and international standing.

The detailed wording of the charge, which I have previously forwarded to you, gives further and more precise instructions. The deadline for the final report is February 27, 2004.

I am writing to formally ask you to serve as the Chair of an NSAC Sub-committee to consider this charge and to report back to NSAC. Similar COV committees have been in use at the NSF for a number of years and are being introduced into the DOE Office of Science. They serve a valuable purpose in assessing the management of key areas of the country's research portfolio and in providing suggestions for improvements to the operations of the program offices.

There will be an NSAC Meeting in the Washington, D.C. area in February, 2004, and I would like to ask you to give a presentation on the findings of your Sub-Committee. The Report itself will need to be sent to me for distribution to NSAC in sufficient time before the NSAC meeting to ensure that the NSAC membership has time to read and think about your Report. I will inform you further of the date and detailed Agenda for the NSAC meeting when it is finalized.

I realize that this task imposes an extra burden on you. However, the work of this sub-committee is very important and I appreciate very much your willingness to take on this task. I therefore want to take this opportunity to express to you and the sub-committee in advance my thanks for what you are doing. I will be available to help you in any way I can and will attend the Sub-committee meetings in an ex officio capacity.

Best regards,  
Rick Casten  
Chair, NSAC

## **Appendix D – Response to OMB Questions**

The following comments extracted from the Committee of Visitors (COV) report address the four questions posed by the Office of Management and Budget.

### 1. Are the best people and proposals being funded?

The outstanding quality and the diversity of science supported by the nuclear physics program within the office of science is a direct consequence of funding of the best people and proposals. Given the tightness of funding, the program officers have made commendable and heroic efforts to provide adequate, stable funding of nuclear physics research. The ONP planning process for identifying new and promising research opportunities and directions is guided through strong, informal communication and interaction with the nuclear physics community. The fact that all of the program managers are experts in the field and have active nuclear physics research experience facilitates easy communication between the ONP and the various research groups. An overall concern of the committee is that inadequate travel money is being allocated to the Nuclear Physics program, this is essential for adequate monitoring of research grants.

### 2. Are the correct reviewers being chosen?

The reviewers chosen were experts in the particular sub-field of the proposals and were well qualified to judge the science and technical aspects. Generally the COV thought that efforts to generate a larger database of reviewers that included more members of the international community would improve the review process and ensure a broader diversity among referees. For the proposals from university and laboratory-based research groups, the COV noted that there were typically 5 or 6 reviewers per proposal. This is an appropriate number that allows for a range of viewpoints and minimizes potential conflicts of interest.

### 3. Are the variety of approaches to merit review and competition being used in an appropriate manner?

The ONP conducts many different types of review to monitor the performance of its various national laboratory, university programs and projects. The combination of peer reviewing for university grants and review panels for national laboratory efforts is an appropriate way of assessing the quality of the various research efforts, when combined with site visits by program officers. The COV considered but does not recommend changing to procedures such as the panel-review process that the National Science Foundation uses for their base program. However, the panel-style review used for targeted solicitations such as the OJI program and the RIA R and D proposals was deemed appropriate.

### 4. Are poorly rated proposals being funded?

Poorly rated proposals are not funded. The decision-making process used by program officers is well documented in the folders reviewed for financial assistance and major items of equipment.