

## Program Assessment Rating Tool (PART)

**Program:** Nuclear Physics  
**Agency:** Department of Energy  
**Bureau:** Office of Science  
**Type(s):** Research and Development

Competitive Grant

Capital Assets and Service Acquisitio

Section Scores				Overall Rating
1	2	3	4	Effective
100%	80%	67%	87%	

**1.1 Is the program purpose clear?**

Answer: YES

Question Weight: 20%

**Explanation:** The mission of the Nuclear Physics (NP) program is to foster fundamental research in nuclear physics that will provide new insights and advance our knowledge on the nature of matter and energy and develop the scientific knowledge, technologies and trained manpower that are needed to underpin DOE missions.

**Evidence:** FY04 Budget Request ([www.mbe.doe.gov/budget/04budget/index.htm](http://www.mbe.doe.gov/budget/04budget/index.htm)). Public Law 95-91 that established the Department of Energy (DOE). The NP Mission has been validated by the Nuclear Science Advisory Committee (NSAC).

**1.2 Does the program address a specific and existing problem, interest or need?**

Answer: YES

Question Weight: 20%

**Explanation:** The NP program addresses five key questions:(1) What is the structure of the nucleon? (2) What is the structure of nucleonic matter? (3) What are the properties of hot nuclear matter? (4) What is the nuclear microphysics of the universe? (5) What is to be the new Standard Model?

**Evidence:** NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)).

**1.3 Is the program designed so that it is not redundant or duplicative of any other Federal, state, local or private effort?**

Answer: YES

Question Weight: 20%

**Explanation:** The Office of Science (SC) NP program is the principal source of federal funding for basic, long-term research in Nuclear Physics.

**Evidence:** More than 90% of U.S. Nuclear Physics research is supported by this program. The remaining 10% is supported by the National Science Foundation (NSF) and coordinated through NSAC - a joint advisory committee.

**1.4 Is the program design free of major flaws that would limit the program's effectiveness or efficiency?**

Answer: YES

Question Weight: 20%

**Explanation:** The NP program is based on competitive merit review, independent expert advice, and community planning. However, a Committee of Visitors (COV) has yet to validate the merit review system.

**Evidence:** NSAC reviews and reports ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Program files.

**1.5 Is the program effectively targeted, so that resources will reach intended beneficiaries and/or otherwise address the program's purpose directly?**

Answer: YES

Question Weight: 20%

**Explanation:** NSAC ensures that input from the nuclear physics research community is regularly gathered to assess new opportunities, priorities, and progress of the program. Peer review is used to assess the relevance and quality of each project.

**Evidence:** NSAC reviews and reports ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Program files.

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**2.1 Does the program have a limited number of specific long-term performance measures that focus on outcomes and meaningfully reflect the purpose of the program?**      Answer: YES      Question Weight: 10%

**Explanation:** The four long-term measures reflect the key scientific drivers that the U.S. nuclear physics community has outlined for the field for roughly the next decade. The program has defined "successful" and "minimally effective" performance milestones for each measure, and an external panel will assess interim program performance, and update the measures as necessary, every five years. It is inappropriate for a basic research program such as this one to have a quantitative long-term efficiency measure.

**Evidence:** NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)). National Research Council report, "Nuclear Physics: The Core of Matter, the Fuel of Stars" ([books.nap.edu/catalog/6288.html](http://books.nap.edu/catalog/6288.html)). A description of the "successful" and "minimally effective" milestones, and an explanation of the relevance of these measures to the field can be found on the SC Web site ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

**2.2 Does the program have ambitious targets and timeframes for its long-term measures?**      Answer: YES      Question Weight: 10%

**Explanation:** NSAC has reviewed the new long-term measures for this program and found them to be ambitious and meaningful indicators of progress in the field. The external reviews described in 2.1 will update the measures, targets, and timeframes on an interim basis.

**Evidence:** Letter from NSAC chair regarding review of long-term measures.

**2.3 Does the program have a limited number of specific annual performance measures that can demonstrate progress toward achieving the program's long-term goals?**      Answer: YES      Question Weight: 10%

**Explanation:** The quantitative annual output measures for facility construction and operations, and the data delivery goals for the program's major facilities, serve as proxies for progress, because the efficient on-cost and on-schedule delivery of scientific data from these large facilities provides a critical resource necessary for continuing scientific discoveries that are directly connected to the long term goals of the program.

**Evidence:** FY04 Budget Request. Website with further information, including explanation of data delivery measures ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

**2.4 Does the program have baselines and ambitious targets for its annual measures?**      Answer: YES      Question Weight: 10%

**Explanation:** All of the annual measures have baseline data (FY01 and/or FY02) that demonstrate that the targets are ambitious, yet realistic. A 20-30 percent tolerance is used to guard against facilities unwisely stressing hardware near the end of the fiscal year.

**Evidence:** FY04 Budget Request. Website with further information ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)). Construction variance target of <10% comes from OMB Circular A-11, especially Capital Programming Guide supplement.

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**2.5 Do all partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) commit to and work toward the annual and/or long-term goals of the program?** Answer: NO Question Weight: 10%

**Explanation:** A limited FY03 audit by the DOE Inspector General (IG) found that "performance expectations generally flowed down into the scope of work at the national laboratories." For individual grantees, NP uses general solicitations that do not explicitly include program goals.

**Evidence:** Memo from the DOE IG to the Director of the Office of Science. M&O contract performance evaluation provisions (e.g., Appendix B in contracts for Jefferson Lab, [www.sura.org/DOE/m&o\\_contract.html](http://www.sura.org/DOE/m&o_contract.html); and, Brookhaven Lab, [www.bnl.gov/prime/searchprime.asp](http://www.bnl.gov/prime/searchprime.asp)). Example of recent general renewal solicitation ([www.science.doe.gov/grants/Fr03-01.html](http://www.science.doe.gov/grants/Fr03-01.html)).

**2.6 Are independent evaluations of sufficient scope and quality conducted on a regular basis or as needed to support program improvements and evaluate effectiveness and relevance to the problem, interest, or need?** Answer: YES Question Weight: 10%

**Explanation:** All research projects undergo merit review; ongoing grants are reviewed triennially; major facilities are reviewed annually; and, construction projects are reviewed quarterly. NSAC produces planning documents and assessments of various components of the NP program on a rotating basis. NP is working to begin a Committee of Visitors (COV) review process for the program on a triennial basis, and expects the first review in 2003.

**Evidence:** SC Merit Review guidelines ([www.sc.doe.gov/production/grants/merit.html](http://www.sc.doe.gov/production/grants/merit.html)). Program files, including Lehman review reports and program advisory committee reports. NSAC reports, including Long-Range Plan, reviews of Low and Medium Energy subprograms, and recent charge letter to NSAC for review of education, theory, and neutron program elements ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Letter from DOE to NSAC establishing a regular evaluation process utilizing a COV.

**2.7 Are Budget requests explicitly tied to accomplishment of the annual and long-term performance goals, and are the resource needs presented in a complete and transparent manner in the program's budget?** Answer: NO Question Weight: 10%

**Explanation:** DOE has not yet provided a budget request that adequately integrates performance information.

**Evidence:**

**2.8 Has the program taken meaningful steps to correct its strategic planning deficiencies?** Answer: YES Question Weight: 10%

**Explanation:** New performance measures and targets have been developed in coordination with OMB. A new COV process is being organized, with the first program review in 2003. The U.S. nuclear physics community has recently completed a long-range strategic plan for the field. As part of the SC strategic planning process, NSAC recently issued a 20-year facilities priority plan for NP.

**Evidence:** Letter from DOE to NSAC establishing a regular evaluation process utilizing a COV. NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)).

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**2.CA1**    **Has the agency/program conducted a recent, meaningful, credible analysis of alternatives that includes trade-offs between cost, schedule, risk, and performance goals and used the results to guide the resulting activity?**    Answer: YES    Question Weight: 10%

**Explanation:** NSAC provides advice to the program on alternative approaches to addressing key physics questions. The program relies on the Lehman review process and program reviews to monitor construction projects. Facility scientific program advisory committees help prioritize facility research. The program does not currently support a capital project for which a Exhibit 300 is required, so no PART-level project-specific alternatives analyses have been necessary.

**Evidence:** NSAC reviews and reports ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Program files, including Lehman reports and program advisory committee reports.

**2.RD1**    **If applicable, does the program assess and compare the potential benefits of efforts within the program to other efforts that have similar goals?**    Answer: NA    Question Weight: 0%

**Explanation:** This is a basic R&D program, and the question is intended for industry-related R&D programs.

**Evidence:**

**2.RD2**    **Does the program use a prioritization process to guide budget requests and funding decisions?**    Answer: YES    Question Weight: 10%

**Explanation:** Although not visible outside DOE, internal SC budget formulation practices include a priority ranking process. The NSAC Long-Range Plan identified strategic priorities for the U.S. nuclear physics community. Previous regular NSAC reviews of subprograms make recommendations, including constant-level-funding scenarios and shutting down facilities. Such reviews prove useful for program planning and should serve as a model for responsible committee advice.

**Evidence:** NSAC Long-Range Plan, Low Energy, and Medium Energy reviews ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)).

**3.1**    **Does the agency regularly collect timely and credible performance information, including information from key program partners, and use it to manage the program and improve performance?**    Answer: NO    Question Weight: 8%

**Explanation:** A great deal of project performance information collected via Lehman facility operations reviews, annual facility reviews, and management changes are made in response to these reviews. The program collects performance data from individual grantees and national labs, and uses peer review as a type of standardized quality control at the individual grant level. However, there is not yet a systematic process, such as regular COV evaluations, that conducts research portfolio quality and process validations. While DOE IG contracts with an outside auditor to check internal controls for performance reporting, and the IG periodically conducts limited reviews of performance measurement in SC, it is not clear that these audits check the credibility of performance data reported by DOE contractors.

**Evidence:** Program files, including Lehman reviews and subprogram reviews. Reporting requirements for grants ([www.science.doe.gov/production/grants/605-19.html](http://www.science.doe.gov/production/grants/605-19.html)).

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**3.2 Are Federal managers and program partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) held accountable for cost, schedule and performance results?** Answer: YES Question Weight: 8%

**Explanation:** Senior Executive Service (SES) and Program Manager Performance Plans are directly linked to program goals. The Management and Operations contracts for the Labs and Facilities include performance measures linked to program goals. Research funding requirements ensure consideration of past performance.

**Evidence:** Program and personnel files, including grant renewal statistics. Performance-based contract fee evaluation provisions (e.g., Jefferson Lab, [www.sura.org/DOE/m&o\\_contract.html](http://www.sura.org/DOE/m&o_contract.html); and, Brookhaven Lab, [www.bnl.gov/prime/searchprime.asp](http://www.bnl.gov/prime/searchprime.asp)). 10 CFR 605 ([www.science.doe.gov/production/grants/605index.html](http://www.science.doe.gov/production/grants/605index.html)).

**3.3 Are funds (Federal and partners') obligated in a timely manner and spent for the intended purpose?** Answer: YES Question Weight: 8%

**Explanation:** Using DOE's monthly accounting reports, SC personnel monitor progress toward obligating funds consistent with an annual plan that is prepared at the beginning of the fiscal year to ensure alignment with appropriated purposes.

**Evidence:** SC programs consistently obligate more than 99.5% of available funds. Program files. Audit reports.

**3.4 Does the program have procedures (e.g. competitive sourcing/cost comparisons, IT improvements, appropriate incentives) to measure and achieve efficiencies and cost effectiveness in program execution?** Answer: YES Question Weight: 8%

**Explanation:** SC is currently undergoing a reengineering exercise aimed at flattening organizational structure and improving program effectiveness. The program collects the data necessary to track the two "efficiency" measures for facility construction and operations management.

**Evidence:** SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)). Program files.

**3.5 Does the program collaborate and coordinate effectively with related programs?** Answer: YES Question Weight: 8%

**Explanation:** The program is well coordinated with a similar program at NSF through a joint Advisory Committee (NSAC) that has produced a recent coordinated strategic plan for nuclear physics. Several experiments at large facilities are jointly funded with NSF and/or international partners. The program has yet to demonstrate adequate coordination and collaboration with other countries (namely Germany and Japan) on future rare isotope accelerators.

**Evidence:** NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)), including chapter on international collaboration. List of joint projects with other offices/agencies/countries.

**3.6 Does the program use strong financial management practices?** Answer: YES Question Weight: 8%

**Explanation:** SC staff execute the NP program consistent with established DOE budget and accounting policies and practices. These policies have been reviewed by external groups and modified as required to reflect the latest government standards.

**Evidence:** Various Departmental manuals. Program files. Audit reports.

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**3.7 Has the program taken meaningful steps to address its management deficiencies?** Answer: YES Question Weight: 8%

Explanation: SC is currently reengineering to improve program management efficiency. A Committee of Visitors (COV) process is being implemented. A layer of management above NP in the SC structure was recently removed.

Evidence: SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)). Program files.

**3.CA1 Is the program managed by maintaining clearly defined deliverables, capability/performance characteristics, and appropriate, credible cost and schedule goals?** Answer: YES Question Weight: 8%

Explanation: Community input, through NSAC, is gathered on what capabilities are needed to address scientific opportunities. The NP program documents the capabilities and characteristics of new facilities at critical decision points that are reviewed by an independent Lehman review. Progress is tracked quarterly through program reviews and annually through Lehman reviews.

Evidence: NSAC reviews, including 1999 ISOL task force report ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Program files, including Lehman operations review reports, and the STAR Barrel Electromagnetic Calorimeter Enhancement project management plan.

**3.CO1 Are grants awarded based on a clear competitive process that includes a qualified assessment of merit?** Answer: NO Question Weight: 8%

Explanation: First time grant applications are encouraged in all Requests For Proposals. The NP Program has a specific solicitation for the Outstanding Junior Investigator (OJI) program, in which awards are made to young non-tenured faculty. Merit review guides all funding decisions. However, the award and merit review process has not yet been validated by a COV.

Evidence: In FY 2002 the NP Program received 31 new research proposals, of which 8 (26%) were approved for funding. 5 OJI awards were made. "How to apply" ([www.science.doe.gov/production/grants/guide.html](http://www.science.doe.gov/production/grants/guide.html)).

**3.CO2 Does the program have oversight practices that provide sufficient knowledge of grantee activities?** Answer: YES Question Weight: 8%

Explanation: In addition to grantee progress reports, program managers stay in contact with grantees through e-mail and telephone, conduct program reviews and site visits .

Evidence: Program files, including a list of multiple annual site visits to lab and university groups.

**3.CO3 Does the program collect grantee performance data on an annual basis and make it available to the public in a transparent and meaningful manner?** Answer: NO Question Weight: 8%

Explanation: In accordance with DOE Order 241.1A, the final and annual technical reports of program grantees are made publicly available on the web through the Office of Scientific and Technical Information's "Information Bridge". However, program-level aggregate data on the impact of the grants program is not adequately communicated in the annual DOE Performance and Accountability report.

Evidence: DOE Order 241.1A. Information Bridge ([www.osti.gov/bridge/](http://www.osti.gov/bridge/)). FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)).

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- 3.RD1 For R&D programs other than competitive grants programs, does the program allocate funds and use management processes that maintain program quality?** Answer: NO Question Weight: 8%
- Explanation:** Priorities are determined in accord with guidance from the NSAC plans and reviews. Unsolicited field work proposals from the Federal Labs are merit reviewed, but not competed. The funds for research programs and scientific user facilities at the Federal Labs are allocated through a limited competition analogous process to the unlimited process outlined in 10 CFR 605. Lehman and other peer reviews of user facilities are conducted annually. However, the quality of the research funded via this process has not yet been validated by a COV.
- Evidence:** NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)). SC Merit Review procedures. ([www.sc.doe.gov/production/grants/merit.html](http://www.sc.doe.gov/production/grants/merit.html)) 10 CFR 605 ([www.science.doe.gov/production/grants/605index.html](http://www.science.doe.gov/production/grants/605index.html)) Separate university and lab solicitations for RIA R&D. Program files, including Lehman reviews of operation at major facilities, and a Jefferson Lab facility peer review.
- 4.1 Has the program demonstrated adequate progress in achieving its long-term performance goals?** Answer: LARGE EXTENT Question Weight: 20%
- Explanation:** NSAC will evaluate progress toward the long-term performance measures every five years. NSAC and National Research Council (NRC) reviews of progress in the program over the past decade have found good scientific progress.
- Evidence:** NSAC Long-Range Plan ("Recent accomplishments, p. 4, [www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf)). NRC Decade Survey report ("Schiffer Report," Introduction, [www.nap.edu/catalog/6288.html](http://www.nap.edu/catalog/6288.html))
- 4.2 Does the program (including program partners) achieve its annual performance goals?** Answer: LARGE EXTENT Question Weight: 20%
- Explanation:** NP has met all but one of its annual performance goals in FY02. The one goal, not timely met, resulted in no adverse effect on the facility.
- Evidence:** FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)). FY04 Annual Performance Plan ([www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf](http://www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf)).
- 4.3 Does the program demonstrate improved efficiencies or cost effectiveness in achieving program goals each year?** Answer: YES Question Weight: 20%
- Explanation:** The recent history of tracking the two "efficiency" measures for facility construction and operation management shows that, on average, the program continues to meet expectations.
- Evidence:** FY04 Budget Request. Program files.

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**4.4 Does the performance of this program compare favorably to other programs, including government, private, etc., with similar purpose and goals?**      Answer: NA      Question Weight: 0%

**Explanation:** The DOE supports over 90% of the U.S. nuclear physics basic research program via this program; the balance is supported by the NSF. The two programs are highly coordinated including a common Advisory Committee (NSAC). A significant number of the projects have international collaborations. An international benchmarking study has not been done, due in part to its questionable value.

**Evidence:** Program files, including list of international projects. "International collaborations and cooperation" chapter in NSAC Long-Range Plan ([www.sc.doe.gov/production/henp/np/nsac/docs/LRP\\_5547\\_FINAL.pdf](http://www.sc.doe.gov/production/henp/np/nsac/docs/LRP_5547_FINAL.pdf))

**4.5 Do independent evaluations of sufficient scope and quality indicate that the program is effective and achieving results?**      Answer: YES      Question Weight: 20%

**Explanation:** NSAC and of the major NP program elements have determined that the program is effective in achieving results. These reviews examine scientific progress against the long-range plan, assess scientific opportunities, and recommend priorities based upon realistic budget profiles. Program advisory committees and Lehman facility operations reviews are generally favorable.

**Evidence:** NSAC reports, including Low- and Medium Energy programs reviews ([www.sc.doe.gov/production/henp/np/nsac/nsac.html](http://www.sc.doe.gov/production/henp/np/nsac/nsac.html)). Program files, including Lehman reviews. Also see evidence from Question 4.1.

**4.CA1 Were program goals achieved within budgeted costs and established schedules?**      Answer: YES      Question Weight: 20%

**Explanation:** All NP construction/operation projects met cost and schedule performance goals during the first two quarters of FY03. No contingency remains in the FY04 data collection schedule for the new BLAST detector at MIT/Bates.

**Evidence:** FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)). FY04 Annual Performance Plan ([www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf](http://www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf)). List of FY03 quarterly milestones. Program files.

## PART Performance Measurements

**Program:** Nuclear Physics  
**Agency:** Department of Energy  
**Bureau:** Office of Science

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**Measure:** Progress in realizing a quantitative understanding of the quark substructure of the proton, neutron, and simple nuclei by comparison of precision measurements of their fundamental properties with theoretical calculations. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a quinquennial basis.

**Additional Information:** An external panel will conduct reviews of progress every 5 years. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2007	Excellent		
2012	Excellent		
2017	Excellent		

**Measure:** Progress in searching for, and characterizing the properties of, the quark-gluon plasma by recreating brief, tiny samples of hot, dense nuclear matter. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a quinquennial basis.

**Additional Information:** An external panel will conduct reviews of progress every 5 years. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2007	Excellent		
2012	Excellent		
2017	Excellent		

**Measure:** Progress in investigating new regions of nuclear structure, studying interactions in nuclear matter like those occurring in neutron stars, and determining the reactions that created the nuclei of atomic elements inside stars and supernovae. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a quinquennial basis.

**Additional Information:** An external panel will conduct reviews of progress every 5 years. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2007	Excellent		
2012	Excellent		
2017	Excellent		

## PART Performance Measurements

**Program:** Nuclear Physics  
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**Bureau:** Office of Science

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**Measure:** Progress in determining the fundamental properties of neutrinos and fundamental symmetries by using neutrinos from the sun and nuclear reactors and by using radioactive decay measurements. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a quinquennial basis.

**Additional Information:** An external panel will conduct reviews of progress every 5 years. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2007	Excellent		
2012	Excellent		
2017	Excellent		

**Measure:** Weighted average number (within 20%) of billions of events recorded by experiments in Hall A, Hall B, and Hall C, respectively, at the Continuous Electron Beam Accelerator Facility. (Targets are set in part by the funding requested/appropriated during that fiscal year. The ambitiousness of the target error bar of 20% is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2001		3.3, 9.9, 2.2	
2002		2.8, 9.9, 2.7	
2003		3.0, 9.0, 2.6	
2004	2.4, 7.2, 2.1		
2005	2.9, 9.6, 2.8		

**Measure:** Weighted average number (within 30%) of millions of heavy-ion collision events recorded by the PHENIX and STAR detectors, respectively, at the Relativistic Heavy Ion Collider. (Targets are set in part by the funding requested/appropriated during that fiscal year. The ambitiousness of the target error bar of 30% is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2002		170, 8.2	

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**Agency:** Department of Energy  
**Bureau:** Office of Science

**Measure:** Weighted average number (within 30%) of millions of heavy-ion collision events recorded by the PHENIX and STAR detectors, respectively, at the Relativistic Heavy Ion Collider. (Targets are set in part by the funding requested/appropriated during that fiscal year. The ambitiousness of the target error bar of 30% is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2003		5500, 38	
2004	900, 40		
2005	1800, 40		

**Measure:** Weighted average number (within 20%) of billions of events recorded at the Argonne Tandem Linac Accelerator System and Holifield Radioactive Ion Beam facilities, respectively. (Targets are set in part by the funding requested/appropriated during that fiscal year. The ambitiousness of the target error bar of 20% is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2001		7.7, 3.4	
2002		2.5, 5.4	
2003		39, 2.1	
2004	25, 5.3		
2005	25, 5.3		

**Measure:** Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time. (Scheduled annual operating time is roughly 21,145 hours in 2004 and 21,450 hours in 2005. The ambitiousness and appropriateness of the 80% target level is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual (Efficiency Measure)
2001	>80%	85%	

## PART Performance Measurements

**Program:** Nuclear Physics  
**Agency:** Department of Energy  
**Bureau:** Office of Science

**Measure:** Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time. (Scheduled annual operating time is roughly 21,145 hours in 2004 and 21,450 hours in 2005. The ambitiousness and appropriateness of the 80% target level is currently under review by OMB.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual (Efficiency Measure)
2002	>80%	89%	
2003	>80%	88%	
2004	>80%		
2005	>80%		

**Measure:** Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects.

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual (Efficiency Measure)
2004	<10%		
2005	<10%		
2006	<10%		