Performance measures

for the DOE OS , for DOE NP/HEP

and alas - for us

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UEC – Oct 17, 2007

Performance Measures

- Significant review process put in place for OMB (elements of GPRA-Government Performance and Results Act-1993)
- "Performance measures"
  - Program Assessment Rating Tool (PART-Bush admin)
  - Our performance is scrutinized
    - Yes/no answers – or a number on an OMB spread sheet
- Will be applied to DOE (NP/HEP…)

Long-term Performance Measures

- 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?
- Purpose of the question: to determine if the program has long-term performance measures to guide program management and budgeting and promote results and accountability. This question seeks to assess whether the program measures are salient, meaningful, and capture the most important aspects of program purpose and appropriate strategic goals.

- Elements of a Yes answer: a Yes answer would require identifying a limited number (e.g., two or three) of specific, easily understood program outcome measures that directly and meaningfully support the program's purpose. A "performance measure" is an outcome or output measure. "Long-term" is defined as covering a relatively long period of time relative to the nature of the program but is likely to be on the order of 5-10 years and consistent with time periods for strategic goals used in the Agency Strategic Plan.
- Programs should have at least one efficiency measure.

Nuclear Physics - RHIC

- Recreate brief, tiny samples of hot, dense nuclear matter to search for the quark-gluon plasma and characterize its properties.
- Timeframe – By 2015
- Expert Review every five years rates progress as “Excellent”

- Minimally effective – Existence of hot, high-density matter established; some of its properties (e.g., its initial temperature via the photon spectrum) measured; confinement properties, and energy transport (via jets) explored.
- Successful – Existence of a deconfined, thermalized medium determined; its properties such as temperature history, equation of state, energy and color transport (via jets), and screening (via heavy quark production) characterized.

Same for everyone

- Simillar things for other NP fields and HEP
- NSAC charged with “approving” or “improving on” measures
  - Subcommittee formed

What does it mean for us?

- Budgets are tough
- We must justify our science
  - Must be clear about our direction?
  - Why do we do what we do?
  - Make it understandable to the layperson
  - Must be clear about our success
- We must convince lawmakers etc
- We must hold our nose (but don't look like it!)

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- Investigate new regions of nuclear structure, study interactions in nuclear matter like those occurring in neutron stars, and determine the reactions that created the nuclei of atomic elements inside stars and supernovae.
  - Timeframe – By 2015
  - Expert Review every five years rates progress as "Excellent"
  - Minimally effective – Properties of nuclei and reactions near and far from stability measured allowing study of effective interactions, collective behavior, and structural evolution; new weakly bound nuclei observed and the limits of binding explored; some reactions of stellar interest measured.
  - Successful – Extensive measurements on stable and exotic nuclei and the drip lines performed; their structure established and the isospin dependence of effective interactions studied; new nuclei with neutron skins observed and studied; reactions for several astrophysical processes, including some r-process nuclei, measured.

- Measure fundamental properties of neutrinos and fundamental symmetries by using neutrinos from the sun and nuclear reactors and by using radioactive decay measurements.
  - Timeframe – By 2015
  - Expert Review every five years rates progress as "Excellent"
  - Minimally effective – Double beta-decay lifetime and neutron electric dipole moment limits extended; participated in low-energy neutrino experiments and beta-decay probing cosmologically relevant neutrino masses; parameters for quark mixing for nuclear beta-decay quantified.

Successful – Double beta-decay lifetime and neutron electric dipole moment limits extended 10-fold or more; R&D completed demonstrating if precision pp solar experiment is possible; played key roles in low-energy neutrino experiments and beta-decay probing cosmologically interesting neutrino ma

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Nuclear Physics

Proposed Long Term Measures

- Make precision measurements of fundamental properties of the proton, neutron and simple nuclei for comparison with theoretical calculations to provide a quantitative understanding of their quark substructure.
    - Timeframe – By 2015
    - Expert Review every five years rates progress as "Excellent"
    - Minimally effective – Quark and gluon contributions to the nucleon's spatial structure and spin measured; theoretical tools for hadron structure developed and tested; data show how simple nuclei can be described at a nucleon or quark-substructure level for different spatial resolution of the data.
    - Successful – Quark flavor dependence of nucleon form factors and structure functions measured; hadron states described with QCD over wide ranges of distance and energy; two-body and three-body nucleon-nucleon interactions expressed in a QCD basis; precision measurements of nucleon spin performed.

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    - Minimally effective – Existence of hot, high-density matter established; some of its properties (e.g., its initial temperature via the photon spectrum) measured; confinement properties, and energy transport (via jets) explored.