ADDENDUM TO FINANCIAL SAVINGS ANALYSIS (October 2008)

Pairwise Comparison of Ratings for Repeatedly Reviewed Projects

PURPOSE:

Initially, the study *"Assessment of Financial Savings from Peer Reviews of In-Progress Projects: A Case Study from the Department of Energy's Hydrogen Program",* was undertaken with the purpose of identifying and quantifying financial savings from investments in program evaluation activities in the Department of Energy (DOE) Hydrogen Program, as a case study in management efficiency as practiced in a federal agency.

The purpose of this additional analysis is to assess whether peer reviewer ratings of projects that were continued despite a low rating at their initial review actually improved at the second review in a subsequent year.

METHODS & ANALYSIS:

The current analysis is based on a pairwise comparison of mean values from two separate and independent reviews of the same projects. Specifically, it focuses on projects that were continued despite a low rating when they were first reviewed in the study timeframe (2003-2007).

There were a total of 89 reviews where the project was continued despite receiving a low reviewer rating (less than 2.75 on a scale of 5). These are not 89 distinct projects, but rather 89 instances a project was reviewed and received a low rating, but was continued. Some of these instances are cases where a project was reviewed twice or more.

In order to use pairwise analysis of independent scores, cases where a continued low-rated project was reviewed more than twice in the 2003-2007 period were excluded from the analysis. Only one project fit this profile, and for this case the third score was dropped from the analysis, leaving a total of 88 reviews for the analysis.

Out of these 88 reviews, 31 were of projects reviewed in one year and again in a subsequent year. Table 1 presents the full list of 31 projects that were continued and reviewed a second time despite a low rating at the first review. The table shows that at the first review, all 31 projects received a low rating.

In 25 of the 31 (81%) of the cases, the rating received at the second review was higher than the rating at the first review.

- For these 25 cases, 20 of the projects received a higher score in the second review that pushed their rating from a low to a moderate rating (between 2.75 and 3.3).
- Five (5) of the 31 projects received a slightly higher rating in the second review, but their score remained in the low-rated category (less than 2.75).

For the remaining 6 projects (19%), the second review rating was lower than the first, though often the difference was only a tenth or a hundredth of a point lower.

On average, the rating for the 31 low-rated projects that were continued was 2.6 at the first review, and 3.0 at the second review. The difference was statistically significant ($p<.000$).

CONCLUSION

The analysis provides evidence to support the claim that reviewed projects tend to improve after the program and principal investigators take into account reviewer comments and recommendations. The adjustments and refinements in response to reviewer comments help improve the technical quality, relevance, or management of projects, thus increasing their likelihood of success.

It bears emphasis that since the reviews are not done by the same panel year after year, but by different, independent external panels, the scores are relatively free from the bias of reviewer familiarity.

Table 1. Data for the Pairwise Analysis

First Year, Second Year	Sub-Program	Project, Performing Organization	Project Score First Review	Project Score Second Review
2003, 2004	Production & Delivery	Novel Catalytic Fuel Reforming Using Micro-Technology with Advanced Separation Technology, InnovaTek	2.72	3.53
2003, 2004	Production & Delivery	Integrated Ceramic Membrane System for H2 Production, Praxair	2.67	3.05
2003, 2004	Storage	Standardized Testing Program for Emergent Chemical Hydride & Carbon Storage Technologies, SwRI	2.7	3.04
2003, 2004	Fuel Cells	Microstructural Characterization of PEM Fuel Cells, ORNL	2.36	3.44
2003, 2004	Fuel Cells	Bipolar Plate-Supported Solid Oxide Fuel Cell "Tuffcell", ANL	2.6	3.21
2003, 2004	Fuel Cells	Cost-Effective Surface Modification for Metallic Bipolar Plates, ORNL	2.56	3.14
2003, 2004	Fuel Cells	Development of Advanced Catalysts for DMFCs, JPL	2.6	2.95
2004, 2005	Production & Delivery	Discovery of Photocatalysts for Hydrogen Production, SRI International	2.42	2.7
2004, 2005	Production & Delivery	WinDS-H2 Model and Analysis, NREL	2.68	2.91
2004, 2005	Storage	Low Cost, High Efficiency, High Pressure Hydrogen Storage, Quantum	2.57	2.96
2004, 2005	Storage	Chemical Hydride Slurry for Hydrogen Production and Storage, Safe Hydrogen	2.68	2.56
2004, 2005	Storage	Sub-Nanostructured No-Transition Metal Complex Grids for Hydrogen Storage, Cleveland State University	2.16	2.06
2004, 2005	Fuel Cells	Development of High Temperature Membranes and Improved Cathode Catalysts, UTC	2.62	3.29
2004, 2005	Fuel Cells	Platinum Recycling Technology Development, Ion Power, Inc.	2.71	3.03
2004, 2005	Fuel Cells	Plate-Based Fuel Processing System, Catalytica	2.62	2.73
2004, 2005	Fuel Cells	Selective Catalytic Oxidation of Hydrogen Sulfide, ORNL	2.7	3.19
2004, 2005	Fuel Cells	Economic Analysis of Stationary PEM Fuel Cell Systems, Battele	2.52	2.63
2004, 2005	Fuel Cells	Development of a Thermal and Water Management (TWM) System for PEM Fuel Cells, Honeywell	2.56	3.03
2004, 2005	Fuel Cells	New Electrocatalysts for Fuel Cells, Foster Miller	2.3	3.4
2004, 2005	Technology Validation	Power Parks System Simulation, SNL	2.53	3.61
2005, 2006	Production & Delivery	Development of a Natural Gas-to-Hydrogen Fueling System, GTI, Bill Liss	2.58	2.9
2005, 2006	Production & Delivery	System Design and New Materials for Reversible Solid-Oxide, High-Temperature Steam Electrolysis, GE Global Research	2.62	2.9
2005, 2006	Fuel Cells	High-Temperature Polymer Electrolyte Membranes, ANL, Debbie Myers	2.64	2.5
2005, 2006	Fuel Cells	Development of Polybenzimidazole-based, High Temperature Membrane and Electrode Assemblies for Stationary and Automotive Applications, Plug Power, Rhonda Staudt	2.64	2.6
2005, 2006	Fuel Cells	Development of Transition Metal/Chalcogen Based Cathode Catalysts for PEM Fuel Cells, Ballard, Stephen Campbell	2.69	2.4
2005, 2006	Fuel Cells	Advanced Fuel Cell Membranes Based on Heteropolyacids, NREL, John Turner	2.41	3
2005, 2006	Technology Validation	Validation of an Integrated System for a Hydrogen-Fueled Power Park, Air Products, Greg Keenan	2.59	3
2005, 2006	Safety Codes & Standards	International Standards and Regulations, LANL, Cathy Padro	2.69	2.6
2006, 2007	Storage	Solutions for Chemical Hydrogen Storage: Hydrogenation/ Dehydrogenation of B-N Bonds; U. of Washington; Michael Heinekey	2.7	3.26
2006, 2007	Storage	Enhanced Hydrogen Dipole Physisorption, California Institute of Tech., Channing Ahn	2.7	2.73
2006, 2007	Storage	Chemical Hydrogen Storage Using Ultra-High Surface Area Main Group Materials, UC Davis, Philip Power	2.5	2.71