THE Ames Laboratory

Creating Materials & Energy Solutions

U.S. DEPARTMENT OF ENERGY

FY2010 PERFORMANCE EVALUATION AND MEASUREMENT PLAN

End of Year Report

Submitted: October 1, 2010

On the Cover: Several of the Journal Covers that featured Ames Laboratory Research in 2010.

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PREFACE

In December, 2006, Iowa State University and DOE entered into a new M&O contract DE-AC02-07CH11358 for the period December 4, 2006 through December 31, 2011. Under the terms in this contract, specifically Clause H.25 and I.96, the Parties agreed to utilize a performance-based management system for Laboratory oversight, and ISU, as the contractor, is required to provide a written assessment of the Contractor's and Laboratory's performance. The purpose of a performance-based management system is to encourage and reward excellence, continuous improvements and timely communication. Appendix B, to the Contract, Modification M056, provided the objectives, measures and expectations for fiscal year 2010.

This report contains the end of year status for each of the objectives and covers the period October 1, 2009 – September 30, 2010.

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INTRODUCTION

This document, the Performance Evaluation and Measurement Plan (PEMP), primarily serves as DOE's Quality Assurance/Surveillance Plan (QASP) for the evaluation of Iowa State University (hereafter referred to as "the Contractor") performance regarding the management and operations of the Ames Laboratory (hereafter referred to as "the Laboratory") for the evaluation period from October 1, 2009, through September 30, 2010. The performance evaluation provides a standard by which to determine whether the Contractor is managerially and operationally in control of the Laboratory and is meeting the mission requirement and performance expectations/objectives of the Department as stipulated within this contract.

This document also describes the distribution of the total available performance-based fee and the methodology for determining the amount of fee earned by the Contractor as stipulated within the clauses entitled, "Conditional Payment of Fee, Profit, and Other Incentives – Facility Management Contracts," and "Total Available Fee: Base Fee Amount and Performance Fee Amount." In partnership with the Contractor and other key customers, the Department of Energy (DOE) Headquarters (HQ) and the Site Office have defined the measurement basis that serves as the Contractor's performance-based evaluation and fee determination. The total available fee: for the period October 1, 2009 to September 30, 2010, Base Fee is $500,000 and Performance Fee is $335,000.

The Performance Goals (hereafter referred to as Goals), Performance Objectives (hereafter referred to as Objectives) and set of Performance Measures and set of Notable Outcomes (Performance Measures/Targets) discussed herein were developed in accordance with contract expectations set forth within the contract. The Notable Outcomes for meeting the Objectives set forth within this plan have been developed in coordination with HQ program offices as appropriate. Except as otherwise provided for within the contract, the evaluation and fee determination will rest solely on the Contractor's performance within the Performance Goals and Objectives set forth within this plan.

Complete details on the determination/assessment of objective ratings can be found in Mod 056 to Contract DE-AC02-07CH11358.

PERFORMANCE GOALS, OBJECTIVES & NOTABLE OUTCOMES

Background

The current performance-based management approach to oversight within DOE has established a new culture within the Department with emphasis on the customer-supplier partnership between DOE and the laboratory contractors. It has also placed a greater focus on mission performance, best business practices, cost management, and improved contractor accountability. Under the performance-based management system the DOE provides clear direction to the laboratories and develops annual performance plans (such as this one) to assess the contractors performance in meeting that direction in accordance with contract requirements. The DOE policy for implementing performance-based management includes the following guiding principles:

- Performance objectives are established in partnership with affected organizations and are directly aligned to the DOE strategic goals;
- Resource decisions and budget requests are tied to results; and
- Results are used for management information, establishing accountability, and driving long-term improvements.

The performance-based approach focuses the evaluation of the Contractor's performance against these Performance Goals. Progress against these Goals is measured through the use of a set of Objectives. The success of each Objective will be measured based on a set of Notable Outcomes, both objective and subjective, that are to focus primarily on end-results or impact and not on processes or activities. Measures provide specific evidence of performance, and collectively, they provide the body of evidence that indicates performance relative to the corresponding Objectives. On occasion however, it may be necessary to include a process/activity-oriented measure when there is a need for the Contractor to develop a system or process that does not currently exist but will be of significant importance to the DOE and the Laboratory when completed or that lead to the desired outcome/result.

The following sections describe the Performance Goals, their supporting Objectives, and associated Notable Outcomes for FY2010.

Overall Score Summary

All Goals, Objectives and Notable Outcomes for FY2010 were met or exceeded.

Table 1. Overall Score by Goal

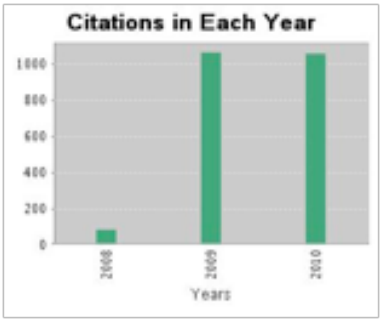
S&T Performance Goal	Letter Grade	Numerical Score	Est. Weight	Weighted Score	Total Score
1.0 Mission Accomplishment	A	4	65.00%	2.600	
3.0 Science and Technology Research Project/Program Management	A	4	35.00%	1.400	
Total Score				**4.000**	**A**
M&O Performance Goal	**Letter Grade**	**Numerical Score**	**Weight**	**Weighted Score**	**Total Score**
4.0 Leadership and Stewardship of the Laboratory	B+	3.4	20%	0.680	
5.0 Integrated Safety, Health, and Environmental Protection	A-	3.7	30%	1.110	
6.0 Responsive Business Systems	A-	3.7	20%	0.740	
7.0 Operating, Maintaining, and Renewing Facility and Infrastructure Portfolio	B+	3.4	20%	0.680	
8.0 Integrated Safeguards and Security Management and Emergency Management Systems	B+	3.4	10%	0.340	
Total Score				**3.550**	**A-**

Goal 1.0- Provide for Efficient and Effective Mission Accomplishment

The contractor produces high-quality, original, and creative results that advance science and technology; demonstrates sustained scientific progress and impact; receives appropriate external recognition of accomplishments; and contributes to overall research and development goals of the Department and its customers.

Scientific and Education Programs Highlights:

- The Ames Laboratory **published 306 papers in FY2010** (as of 09/20/10). Of these papers, 57.2% involved collaborations with researchers not affiliated with the Contractor or the Laboratory and 31.7% involved collaborations with researchers in 26 different countries. 10.5% involved co-authorship with other DOE national laboratories.
- 7 of our papers were published in peer-reviewed journals with impact factors greater than 10 and another 15 were published in journals with impact factors greater than 6. 1 paper published in FY2010 has already been cited 20 or more times.
- Dr. Karl Gschneidner, Jr. provided congressional testimony on the importance of rare-earth elements to the Investigations & Oversight Subcommittee, House Committee on Science and Technology. *(BES)*
  - Article on Karl Gschneidner's testimony before congress on the potential rare-earth crisis received national media attention from the *Wall Street Journal, Huffington Post, New York Times, Popular Science, Chemical and Engineering News,* and *Physorg.com.*
- Developed a new method for growing crystals of the new *R*FeAsO (*R* = rare earth) superconducting compounds that yields single crystals with dimensions approaching 5 mm. The growth challenge was identifying a flux with relatively high oxygen solubility that does not form other stable compounds with the rare earth. The availability of crystals has enabled the first series of experiments clarifying the basic physics of these compounds *(BES)*.
- The ability to respond quickly and overwhelmingly to new opportunities in materials discovery, characterization, and applications was demonstrated by the rapid synergistic collaboration for new high-temperature Fe-As-based superconductors. From October 2008 to 2010, over 141 Ames' scientific articles were published on the subject, with over 2214 citations (see chart). (BES)



- Demonstrated experimentally, for the first time, for light-induced magnetization rotation in the femtosecond regime using GaMnAs/GaAs heterostructures, as predicted theoretically in 2006. Controlling magnetism at such time scales has possible implications for extremely high-speed information computation and storage technology, including switching and memory *(BES).*
- Developed single cell level mass spectrometric imaging technique for plant metabolites. This technique achieved, for the first time, chemical imaging for a whole flower and a root hair with high spatial resolution, permitting detailed assessment of a system's metabolism. (BES)
- Discovered a new material (Calcium-Gold-Bismuth) system that exhibits not just one but five spinodally-related phases. This rare spinodal decomposition (only 20 similar reported) occurs

Scientific and Education Programs Highlights:

spontaneously through demixing of solids to produce stable compounds as finely divided nanocrystalline phases. Tuning spinodal materials behavior have applications in thermoelectric devices that convert heat into electricity, and are known to affect ultrahigh-strength steels, magnetic alloys, optical recording, and nanoscale materials. *(BES)*

- Observed single enzyme molecules via *chemi*luminescence for the first time, where previously it was only detected by florescence, which dominates by orders of magnitude. (BES)
- Achieved active control of single electrons in solid matter by decoupling a single quantum mechanical spin from its environment via magnetic pulse sequences – published in 2 *Science* and 2 *Physical Review Letters*. The technique increases the coherence of the quantum spin state by a factor of 25 and offers new possibilities for using defects in crystals as highly sensitive nanoscale magnetic sensors or *qubits* for quantum information processing. *(BES*)
- Developed a novel and excellent catalyst for the esterfication reaction from the basic understanding of the solid-liquid interface; the first demonstration of enhancing chemical transformation by expelling byproducts from a mesoporous catalytic center and driving the reaction equilibrium forward via Le Chatelier's principle. *(BES)*
- Received a 2010 R&D 100 Award for *osgBullet*, a virtual engineering software package that creates 3-D, real-time computer simulations that assists engineers design more efficient complex systems ranging from next-generation power plants to highly efficient cars. Work in the Simulation, Modeling and Decision Science program has led to 3 R&D 100 Awards in 5 years, and 2 Federal Laboratory Consortium Awards. (FE)
- Measured, for the first time, the gene expression in living cells in real time. Aptamers were used to provide a real-time signal of how much RNA was newly synthesized in the cells. Potential applications include studies of gene expression during developmental, wound-healing and stress responses in plants, animals and prokaryotes. *(BER)*
- Added two new DOE education programs at the Laboratory: the Faculty and Student Teams program and the Pre-Service Teacher Program. *(WDTS)*
- David Baldwin was selected to serve on the White House's Interagency Working Group on Research, Development, Testing and Evaluation for the National Science and Technology Council, Committee on Science, Subcommittee on Forensic Science. *(NIJ WFO)*
- Developed an objective quantification method for forensic comparison of toolmark impressions that permit validation of visual inspection techniques and the relative uniqueness of toolmarks. These scientific innovations are needed to support or refute long-held forensic science practice dominated by examiner-based visual inspection methods. *(NIJ WFO)*
- Pat Thiel was appointed to a three-year term on the National Academies' Chemical Sciences Roundtable, leaders in chemical research and enterprise whose objective is to facilitate communication between all segments of chemistry research and industry.
- Pat Thiel was selected for the 2010 ACS Arthur W. Adamson Award for Surface Chemistry.
- Pat Thiel was selected for the 2010 APS Adler Lectureship.
- Paul Canfield was appointed to the Condensed Matter and Materials Research Committee of the National Academies, which advise the Board on Physics and Astronomy and the National Research Council on the fields of condensed matter science and materials research.
- Mei Hong was awarded the 2010 Founders' Medal from the International Council on Magnetic Resonance in Biological Systems.

Program Accomplishments by DOE Programmatic Office (alphabetically)

Office of Advanced Scientific Computing Research

- Mark Gordon was elected as a Fellow of the American Chemical Society in the inaugural class.
- Mark Gordon was elected as a Fellow of the American Association for the Advancement of Science.

Office of Biological and Environmental Research

- With the aid of biophysical parameters, computational modeling can accurately predict an RNA structure that is closer to the solution structure under conditions that cannot easily be achieved by biophysical means because of the high degree of mobility in these structures. .In these studies RNA changes structure upon binding ligand was demonstrated through analysis the structure of an aptamer with a combination of biochemistry and computational approaches to understand the dynamics of aptamer-ligand interaction. The demonstration that computation analysis provides accurate structural predictions of RNA motions will facilitate the application of many small functional RNAs in nanotechnology such as in biosensing devices.

Office of Basic Energy Sciences- Chemical Sciences, Geosciences and Biosciences Division

Catalysis

- Developed a novel, excellent catalyst for esterfication reactions from the basic understanding of the solid-liquid interface achieved via a novel synthetic approach, solid-state NMR characterization, and theory – the first demonstration of enhancing chemical transformation by expelling byproducts from a mesoporous catalytic center and driving the reaction equilibrium forward via Le Chatelier's principle.
- Revealed a breakdown from Markovian chemical kinetics occurs for catalytic polymerization in mesopores due to the interplay between anomalous single-file diffusion in narrow pores and reaction. Developed an alternative continuous-time-random-walk formulation that correctly describes polymer growth. Surface-functionalized mesoporous materials offer great potential for achieving selectivity in catalysis.
- To address the DOE Science Grand Challenge on Beyond Equilibrium "How can we understand and characterize metastability?" (BESAC 8/06 report), developed conceptual and simulation tools for non-equilibrium autocatalysis where a thermodynamic free-energy framework does not exist.
- Measured diffusion of single particles and molecules in real time in nanopores. One-dimensional diffusion in these narrow channels was found to be substantially slower than in the bulk solution.
- Developed new photocatalytic process for oxidative decarbonylation of alcohols. The process converts alcohols RCH_2OH into RH, H_2, and CO (R = H, CH_3, Ph) without an acceptor, potentially important for the conversion of oxygen-rich biomass, e.g., carbohydrates, into hydrocarbons.
- Discovered tridentate, monoanionic tris(oxazolinyl)borate centers stabilize zinc(II) compounds have highly reactive ligands, including hydride, alkoxide, azide, peroxide, and alkyl. The compounds are catalysts for Si-O and Si-N bond forming reactions involving dehydrocoupling.
- Developed highly active zirconium catalysts for C-N bond formation – the most reactive zirconium catalysts for olefin hydroamination yet reported. Our studies on stereoselective catalysis provide new mechanistic insight that would not be possible with achiral catalysts.
- Discovered a rapid, base-catalyzed insertion of molecular oxygen into a rhodium-hydride to generate a hydroperoxo complex. Such species are crucial intermediates in catalytic oxidations of organic substrates with molecular oxygen. Featured on the cover of *Inorganic Chemistry*.

Separations and Chemical Analysis

- Observed single enzyme molecules via chemiluminescence. Previously, single molecules have been

detected by fluorescence spectroscopy. Light generated by chemiluminescence is many orders of magnitude weaker. For the first time, we used an ultrasensitive CCD camera to record individual luciferase molecules trapped in nanopores.

- An automatic calibration and scanning-angle prism-type total internal reflection fluorescence microscope (TIRFM) was constructed and tested for the highest vertical resolution.
  - Developed a computer program to automatically optimize the horizontal position of the laser spot at each incident angle, yielding completed auto-calibration within minutes.
  - The new instrument can provide axial resolution better than 10 nm.
  - The TIRFM can scan the full range of incident angle with increments smaller than 0.2°.
  - Additionally, when the incident angle is changed within the subcritical angle range, the instrument can be further applied to variable-angle pseudo TIRFM or *epi*fluorescence.
- An automatic calibration and scanning-angle prism-type total internal reflection fluorescence microscope (TIRFM) was constructed and tested for the highest vertical resolution.
- Developed a two-dimensional electro-fluid-dynamic device that can take a continuous solution stream containing a mixture of two compounds and separate it into two channels, each containing a pure compound, thus reversing the spontaneous mixing process.
- Developed a multiplexing detection scheme with differential interference contrast (DIC) microscopy. The contrast of non-fluorescent nanoparticles (NP) in DIC depends on the illumination wavelength, allowing multiplexing NP identification and simultaneous imaging of multiple probes and cell features.

Energy Biosciences

- Developed single cell level mass spectrometric imaging technique for plant metabolites. *This is the first time chemical imaging was achieved for a whole flower and a root hair in this high spatial resolution.*
- Developed an effective method to measure single cell level analyte population using mass spectrometry imaging technique. The population of cholesterol in single astrocyte cell was obtained in this method.
- Developed a novel mass spectrometric imaging technique that can obtain more chemical information in less data acquisition time. In this method, multiple mass spectral data can be acquired in a single imaging measurement; high mass resolution spectra, low mass resolution spectra in high spatial resolution, and MS/MS or MSn spectra of a few selected ions.

Chemical Physics

- Completed a fully operational Hartree-Fock code running on hybrid GPU/CPU hardware. This has been implemented in the distributed version of GAMESS.
- Obtained for the first time a theoretical energy curve for the dissociation of the ground state of the oxygen molecule O_2 to an accuracy capable of recovering the known vibrational spectrum (35 levels) with near spectroscopic precision using a novel method for calculating electron correlations developed at the Ames Laboratory. For the region that so far has proved inaccessible to experiment, six additional energy levels were predicted. Because of the great importance of oxygen in many biological, atmospheric, combustion as well as technical processes, the contribution of accurate theoretical energy information is of considerable usefulness, in particular where basic experimental data are lacking.
- Devised a new theoretical method to describe the bond between two beryllium atoms that arise entirely from changes in inter-electronic correlations – which no current theory can address. From the method, calculated an accurate dissociative energy curve that yielded the first in-depth analysis for the origin of such a bond.
- A method for treating electron correlation successfully was recently devised for polyatomic molecules from the correlation energies of its localized self-consistent-field orbitals (exploitation of its local character). With this new approach, we achieved the first successful determination of the full valence

correlation in NCCN, a molecule that is important in biological chemistry, in environmental chemistry, in the formation of nanomaterials as well as in astrochemistry.

Office of Basic Energy Sciences – Division of Materials Sciences and Engineering (DMSE)

- The ability to respond quickly and overwhelmingly to new opportunities in materials discovery, characterization, and applications was demonstrated by the rapid synergistic collaboration for new high-temperature Fe-As-based superconductors. From October 2008 to 2010, over 141 Ames' scientific articles were published on the subject, with over 2214 citations.
- Discovered that mechanochemical reactions, which appear to be true solid-state processes, occur in a liquid phase. Identified the major condition for such reactions is the formation of low-melting eutectics from the starting materials. The mechanical processing is an essential element of mechanochemical reactions as it enhances surface interactions between reacting materials, supports their intimate mixing, provides mass transfer and the initial energy required for the formation of low-melting eutectics.
- Using a quantum kinetic transport theory and theoretical concepts from quantum critical systems, the conductivity and electron viscosity of graphene were determined. The shear viscosity of graphene is found to be exceptionally small, permitting low-dissipation electron motion for small multi-terminal devices. It places graphene, along with the quark gluon plasma and cold atom gasses, in the family of almost perfect liquids. Fast and dissipation-free electron dynamics are crucial for nano-electronics applications of graphene.
- Recent studies of indium on silicon at low temperatures have shown the wetting layer moves with high speed to build flat-topped islands. At low amounts of indium two types of indium islands are grown with different crystallographic structure (face center cubic versus body center tetragonal) because nanoscale structures can differ from bulk (body center tetragonal) structures. When the amount of indium increases, the wetting layer moves selectively only to the body center tetragonal islands which grow very quickly, while the face center cubic islands remain practically unchanged as a result of compressive forces in the metallic layer.
- Found that silver islands distort to maximize the match between the wavelength of electrons confined in the islands and the dimension of the islands, demonstrating that electronic effects can influence an island's structure. Under very specific conditions, patterned regions created with the tip of a scanning tunneling microscope serve to nucleate metallic silver so that regular, nanostructured island arrays form whose separation can be controlled precisely.
- Discovered that the same atom plays different roles in rare-earth-based magnetism depending on its location in a complex crystal structure. When even a small amount of gadolinium is replaced with other atoms on one specific site in the Gd_5Ge_4, radical changes in the magnetic properties were predicted theoretically and observed experimentally, which does not occur when substituting gadolinium in the other possible two positions. Ferromagnetism in this material is thus demonstrated to be uniquely associated with the gadolinium atom in the middle of the nanolayers that form this compound.
- Exploratory syntheses in zinc-based systems have discovered several new crystalline approximants to quasicrystalline phase providing insight into chemical bonding leading to aperiodicity in complex alloys. Structural characterization and surface studies of a new complex metallic alloy in the Al-Pd-Zn system show broken icosahedral features and weakly bound Zn.
- Discovered a new 1/1 bcc quasicrystal approximant phase at the Mg-rich side in Mg-Pd-Zn system of the phase diagram, a structure which is the new type of icosahedral approximant.
- Superconductivity in the FeAs-based compounds emerges from a non-trivial, metallic state with complex fluctuations and correlations. To gain insight into the similarities and differences between the CuO-based and FeAs-base, high-T_c compounds, detailed measurements were conducted for anisotropic magnetization, electrical resistivity and thermal conductivity. To obtain the in-plane anisotropy for the orthorhombic phase (which competes with superconductivity), developed a strain detwinning method that provided the first in-plane, anisotropic, resistivity data for some of the AFe_2As_2 (A=Ba, Sr, Ca)

materials. Our results indicate that (i) there is a clear anisotropy in the nominally tetragonal phase that may originate from nematic fluctuations and (ii) the similarities between FeAs and CuO based high Tc materials may be more comprehensive than phase diagrams and extend to ideas such as pseudo-gaps.

- Determining unified structural / magnetic phase diagrams we are gaining insight into the conditions necessary and the nature of the mechanism for, and symmetry of, the superconductivity in Fe-As-based superconductors. Comprehensive studies of $Ba(Fe_{1-x}TM_x)_2As_2$, with TM = Co, Ni, Cu, Ru, Rh, Pd, Cr and Mn, shows that superconductivity occurs when the competing structural / magnetic phase transitions are adequately suppressed over a well-defined range of added electrons or pressure. This effort exploited our synthetic capabilities combined with characterization of the thermodynamic, transport and spectroscopic properties, and in tandem with theoretical efforts.
- Nanocrystals of apatitic calcium phosphate impart the organic-inorganic nanocomposite in bone with favorable mechanical properties, but the factors preventing crystal growth beyond the optimal thickness of ~ 3 nm have not been identified. Using multinuclear magnetic resonance (NMR), nanocrystal surfaces in bone were found to be studded with strongly bound citrate molecules and have characterized the density and geometry of the bound citrate, with the three carboxylate groups at distances of 0.3 to 0.45 nm from the apatite surface. Bound citrate is highly conserved, being found in fish, avian, and mammalian bone, which indicates its critical role in interfering with crystal thickening and stabilizing the apatite nanocrystals in bone.
- A breakthrough on active control of single electrons in solid matter was achieved by decoupling a single quantum spin from its environment using a specially designed sequence of high-precision electromagnetic pulses, offering a possibility for using defects in crystals as highly sensitive nanoscale magnetic sensors or *qubits* for quantum information processing. Nitrogen-vacancy centers in diamond have attracted attention for this application, but their fragile quantum magnetic spin states are destroyed by miniscule interactions with the outside world. Controlling spins of the defect centers via the pulse sequences, the single spin state was protected and evolved as if it were decoupled from the external world, increasing the lifetime of the quantum spin state 25-fold at room temperature.

Office of Workforce Development for Teachers and Scientists

- Began the "Greenlee Project," in conjunction with our Contractor. Students will interview Laboratory scientists, associate scientists, and post docs on their research with the goal of getting some of their stories published in the national news media.
- Science Undergraduate Laboratory Internship program grew to 21 students in 2010, which represented a 24 percent increase in the size of the program over 2009. DOE Academies creating Teacher Scientists grew from 10 to 19 students or an increase of 90 percent over 2009.
- Four Ames Laboratory scientists received Outstanding Mentor plaques recognizing their service to the DOE's Science Undergraduate Laboratory Internship program. The scientists served at student mentors during the 10-week summer internship at the Laboratory.
- Both High School and Middle School teams placed in their respective competitions at the DOE National Science Bowl.

Other DOE Program Offices and Work for Others

- Methods for discovery of new ultrahigh temperature structural alloys are providing a new and more efficient means of sifting through prospective phase space to identify regions in ternary systems that have high melting temperatures. The semi-empirical approach used here allows a rapid screening method. Utilizing a semi-empirical approach to estimate formation enthalpies thousands of combinations of refractory and transition metals with oxide forming elements Al, Si and Cr, have been screened in a short time. A more accurate *ab initio* methods was then used to refine the search. This

approach has been used to 1) identified the Mo-Ni-Al as the base constituents for a potential new high temperature alloy and to 2) further refined the oxidation resistant Ni-Al system with ternary additions of platinum group metals. (EERE)

- A new collaboration between Ames Laboratory, ORNL and 3 universities and an industrial partner to develop non rare-earth magnets for traction motors has begun. (EERE)
- Gene Takle was asked to serve on two EERE Wind Strategic Planning Committees. (EERE)
- Received a 2010 R&D 100 Award for *osgBullet*, a virtual engineering software package that creates 3-D, real-time computer simulations that assists engineers design more efficient complex systems ranging from next-generation power plants to highly efficient cars. Work in the Simulation, Modeling and Decision Science program has led to 3 R&D 100 Awards in 5 years, and 2 Federal Laboratory Consortium Awards. (FE)
- Integrated the Ames Laboratory's femtosecond-laser ablation system into the multi-collector ICP-MS at ORNL. The project explored the use of these combined technologies for isotopic screening of the types of nuclear non-proliferation samples typically received by NWAL laboratories. (NA-22)
- Building upon an existing cocaine specific aptamer, a differential surface stress sensor determined the surface stress generation due to binding of cocaine molecules. These experiments detect cocaine down to a concentration of 5 µM at room temperature. Biochemical work on characterization and optimization of the existing aptamer has shown that careful control of the buffer composition and aptamer variants with unnatural bases results in 40-fold increase in affinity for cocaine binding. (NIJ-WFO)

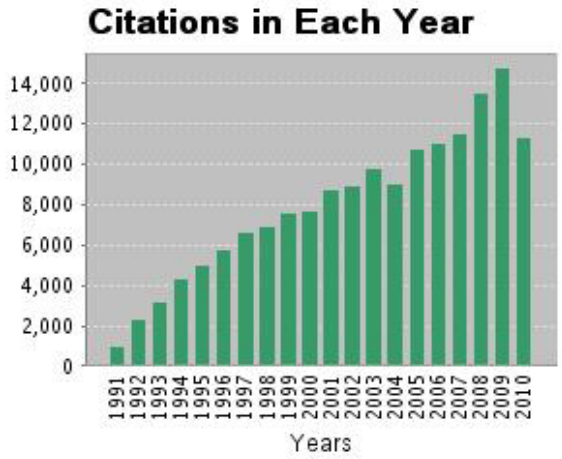
Awards:

Program	Recipient	Award
AMCS	Gordon ,Mark	AAAS Fellow ACS Fellow
CBS	Hong, Mei	AAAS Fellow Founder's Medal, International Council on Magnetic Resonance in Biological Systems
CBS	Sadow, Aaron	NSF CAREER
CBS	Smith, Emily	NSF CAREER
DMSE	Bud'ko, Sergey	American Physical Society Outstanding Referee APS Fellow
DMSE	Clem, John	American Physical Society Outstanding Referee
DMSE	Akinc ,Mufit	AAAS Fellow
DMSE	Anderson, Iver	Federal Laboratory Consortium Excellence in Technology Transfer: Lead Free Solder follow on
DMSE	Biswas, Rana	APS Fellow
DMSE	Canfield, Paul	National Academies' Condensed Matter of Materials Research Committee
DMSE	Cook, Bruce	2010 FLC Mid-Continent Excellence in Technology Transfer Award: BAM-Tb
DMSE	Harringa, Joel	2010 FLC Mid-Continent Excellence in Technology Transfer Award: BAM-Tb
DMSE	Mallapragada, Surya	Distinguished Service Award in Chemical Engineering from the Food, Pharmaceutical and Bioengineering Division of the American Institute of Chemical Engineers
DMSE	O'Donnell, Jennifer	DOE Early Career Research Award
DMSE	Russell, Alan	2010 FLC Mid-Continent Excellence in Technology Transfer Award: BAM-Tb
DMSE	Thiel, Pat	National Academies' Chemical Sciences Roundtable ACS' Arthur W. Adamson Award for Distinguished Service in the Advancement of Surface Chemistry

Program	Recipient	Award
SMDS	Bryden, Mark	2010 Federal Laboratory Consortium's National Excellence in Technology Transfer: VE-Suite; R&D100 Award for "*osg Bullet*"
SMDS	McCorkle, Doug	2010 Federal Laboratory Consortium's National Excellence in Technology Transfer: VE-Suite R&D 100 Award for "*osg Bullet*"
SMDS	Takle, Gene	University Corporation On Atmospheric Research Board of Trustees
NDE	Thompson, Bruce	Member, DOE Environmental Management Single Shell Tank Integrity Panel

1.1 Science and Technology Results Provide Meaningful Impact on the Field;
1.2 Provide Quality Leadership in Science and Technology; and
1.3 Provide and Sustain Outputs that Advance Program Objectives & Goals.

- Invited Talks: 114 including 5 keynote lectures and 3 plenary lectures
- As of 9/21/10, published **306** papers for FY2010 according to ISI Web of Science.
  - 57.2% involved collaborations with researchers not from Ames Laboratory of ISU
  - 31.7% involved internal national collaborations with, in total, 26 different countries.
  - 7 very high impact peer-reviewed journal articles (impact factor > 10)
  - 15 high impact peer-reviewed journal articles (impact factor 6<x<10)
  - 15 Special editor's selected papers
  - 6 journal covers



Citations for papers published from CY1990 – present

Sorted by year cited as of 9/27/10 according to ISI Web of Science

Top Most Cited Papers Recognized by the Publishing Journal in FY2010:

Journal of Physics: Condensed Matter — Top 20 in the last 20 years
C. H. Xu, C. Z. Wang, C. T. Chan and K. M. Ho "A Transferable Tight-binding Potential for Carbon" Journal of Physics-Condensed Matter, 1992, 4, 6047-6054. *Cited: 474 times*

Surface Science Reports — Top 10 in the last 5 years
J. W. Evans, P. A. Thiel and M. C. Bartelt "Morphological Evolution during Epitaxial Thin Film Growth: Formation of 2D Islands and 3D Mounds" Surf. Sci. Rep., 2006, 61, 1-128. *Cited: 119 times.*

Top 10 Most Cited Papers Published in the Last 5 years (2006 – present)

1. C. de la Cruz, Q. Huang, J. W. Lynn, J. Y. Li, W. Ratcliff, J. L. Zarestky, H. A. Mook, G. F. Chen, J. L. Luo, N. L. Wang and P. C. Dai "Magnetic order close to superconductivity in the iron-based layered $LaO_{1-x}F_xFeAs$ systems" Nature, 2008, 453, 899-902. DOI 10.1038/nature07057 *Cited: 555 times*

2. G. Dolling, M. Wegener, C. M. Soukoulis and S. Linden "Negative-index metamaterial at 780 nm wavelength" Optics Letters, 2007, 32, 53-55. *Cited: 250 times*

3. G. Dolling, C. Enkrich, M. Wegener, C. M. Soukoulis and S. Linden "Simultaneous negative phase and group velocity of light in a metamaterial" Science, 2006, 312, 892-894. DOI 10.1126/science.1126021 *Cited: 238 times*

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3. T. M. Chuang, M. P. Allan, J. Lee, Y. Xie, N. Ni, S. L. Bud'ko, G. S. Boebinger, P. C. Canfield and J. C. Davis "Nematic Electronic Structure in the "Parent" State of the Iron-Based Superconductor Ca(Fe1-xCox)(2)As-2" Science, 327, 181-184. DOI 10.1126/science.1181083

4. M. A. Tanatar, J. P. Reid, H. Shakeripour, X. G. Luo, N. Doiron-Leyraud, N. Ni, S. L. Bud'ko, P. C. Canfield, R. Prozorov and L. Taillefer "Doping Dependence of Heat Transport in the Iron-Arsenide Superconductor Ba(Fe1-xCox)(2)As-2: From Isotropic to a Strongly k-Dependent Gap Structure" Physical Review Letters, 104, 067002. DOI 10.1103/PhysRevLett.104.067002

5. R. Prozorov, M. A. Tanatar, N. Ni, A. Kreyssig, S. Nandi, S. L. Bud'ko, A. I. Goldman and P. C. Canfield "Intrinsic pinning on structural domains in underdoped single crystals of Ba(Fe1-xCox)(2)As-2" Physical Review B, 2009, 80, 174517. DOI 10.1103/PhysRevB.80.174517

1.4 Provide for Effective Delivery of Products.

- Science one-pagers, FWP's, financial plans and other documents continue to be submitted to the responsible DOE Program on time or early. As was previously discussed, the research results are

effectively being communicated to the worldwide scientific community and these results are being cited often in the literature, with numerous high-visibility contributions and awards.

- Program goals and milestones, as well as mission objectives are most often met before or on schedule. The reasons for slipped schedules are fully discussed with the HQ point of contact to keep DOE in the loop and to try to find acceptable means to get the project back on schedule.
- There were 2 DOE sponsored program reviews in FY2010; one in the Division of Materials Science and Engineering (a triennial review of 6 BES) and the other in the Chemical and Biological Sciences program (FWP entitled "Homogeneous and Interfacial Catalysis in 3D Controlled Environment"); one CBS FWP ("Chemical Physics") is currently undergoing a mail-in review. Reviews noted the "strong outcomes … and promising prospects for the proposed research" and commended "… the excellent organization of the review process ..." More details are provided in Notable Outcome 3A.

Overall Grade 1.0: **A**

Goal 3.0- Provide Effective and Efficient Science and Technology Program Management

The contractor provides effective program vision and leadership; strategic planning and development of initiatives; recruits and retains a quality scientific workforce; and provides outstanding research processes, which improve research productivity.

3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision.

Joint Planning with Communities Outside of the Ames Laboratory

- Two planning meetings with Argonne National Laboratory were held to look at synergistic opportunities for basic research on materials synthesis, design and processing. These meetings involved upper management and scientists from both laboratories.
- Worked with North Dakota State University to develop new opportunities of mutual interest. This included the Director, Assistant Director and several scientists traveling to NDSU.
- Held management level discussions with Sandia National Laboratories to explore opportunities for sharing expertise to advance soft materials research.

Scientific Vision Articulation:

- DOE comments received at the Laboratory Plan meeting were receptive to the goals set forth in the strategic plan.
- The Laboratory worked very hard on a new website to help promulgate the Laboratory's vision, strengths, and success stories. The new website went live to the public on September 30, 2010. The new website may be accessed via: http://www.ameslab.gov.
- The Laboratory's science magazine, *Inquiry*, was reworked so that each issue focuses on a specific topic.
- Began developing "Ames Lab 101" videos on Laboratory research. Videos include short, one-minute synopses of active research projects that are explained by scientists themselves. Videos are made available to media and the public. Other videos now appear on YouTube and the Ames Laboratory website.
    - Video on Ames Laboratory's rare- earth research appeared on Secretary of Energy Steven Chu's Energy blog.

Development of New Facilities and Research Programs

- The Laboratory initiated two new research programs that were given one year seed funding by BES – DMSE. One program is in the area of molecular metamaterials and the other is in materials design and discovery utilizing computational approaches.
- Two preproposals have been submitted in response to the CMCSN call by BES.
- Two proposals are under review by BES. One is in the area of solid state NMR, one of the main thrust of our strategic plan. The other is in understanding mechanical properties in nanocrystalline materials.
- Ames Laboratory/Contractor royalty funds were used to support five new internal seed proposals up to $55K total each. The work funded is in areas consistent with our scientific strategic plan.
- Laboratory management has begun to outline an alternative approach to meeting the Laboratory's facility needs including facilities for sensitive instrumentation, computation and state of the art conferencing.

Ability to Attract and Retain Highly Qualified Staff

- Hired Dr. Duane Johnson from the Departments of Physics and Materials Science and Engineering at the University of Illinois at Urbana-Champaign into the Chief Research Officer position. Urbana-Champaign's Materials Science and Engineering Department is ranked 2nd at both the undergraduate and graduate level according to the 2011 U.S. News and World Report rankings of science specialties. Dr. Johnson was the Ivan Racheff Professor of Materials Science and Engineering at the University of Illinois at Urbana-Champaign and the director of the National Science Foundation-supported Materials Computation Center. Johnson is an internationally recognized leader in the area of materials theory and computational materials science, with more than 150 publications and approximately 100 invited presentations.
- Successfully retained one of our highly sought after staff who had an offer from a nationally-ranked university in the U.S; another scientist who accepted a position several years ago in England, his home country, has been attracted back to the Ames Laboratory and ISU.
- Engaged several ISU faculty members to work on wind power in support our strategic initiative in this area.
- Preparing new career advancement paths for our scientists with our contractor.

3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management.

- In FY2009, the Laboratory approved its first formal scientific research plan. In FY2010, management worked to align our current research programs to insure success of this plan. Management decisions about all projects are based on our scientific strategic plan.
- Established a process by which we solicit internal white papers for potential development of new research programs. This involves management at the Division and Executive levels.
- Established a process to produce highlights for our research in a timely manner.
- Made tough management decisions about FWP leadership. When it become evident that an FWP leader was failing to fulfill his role in leading the scientific effort and defining scientific directions, the leadership was changed in consultation with BES. The result of this new leadership was a program review of that FWP with no action items requested.
- Initiated an assessment of the Ames Laboratory electron beam microcharacterization instrumentation facility to evaluate its current utilization by research programs at the Ames Laboratory and by our contractor, Iowa State University. This assessment will be used to define an appropriate management structure for the facility (Division or Laboratory level) and provide the historical usage data for an appropriate cost recovery structure to be developed. The study is reviewed semi-annually by the Lab Director at which time there is an opportunity to provide input on the process.
- Initiated facility planning to house existing vibration sensitive equipment in space specifically designed to ensure the maximum potential of the instrumentation and enable us to purchase new equipment to meet the characterization needs of Ames Laboratory research portfolio to ensure the Laboratory is at the forefront of our core competencies.
- Added capacity to the production line for rare earth processing to remove bottlenecks and ensure continuous availability of ultrahigh purity rare earths to the global scientific community.
- Division level strategic planning was initiated to ensure alignment of work with the Laboratory strategic plan. This planning involved members of our scientific staff and will result in a written plan that will be reviewed by the Laboratory Oversight Board.

3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs.

- Upper level management increased their visits and communications with HQ this fiscal year. Given the loss of the CBS Program Director this was especially important. Conversations with HQ were held about recruitment and retention of key scientific personnel. Worked with HQ to ensure effective and efficient onsite program reviews.

- Public Affairs places a high level of importance on communicating information to key contacts. Following are examples of offices worked with:
  - DOE Chicago Operations – all news releases are routed to DOE-CH before they are sent out to media and the public.
  - DOE Office of Science Public Affairs –Public Affairs participates in regular conference calls with Office of Science Public Affairs to communicate news and information. Ames contributes to the Office of Science's Weekly Report for labs.
  - ISU University Relations -PA works closely with ISU's University Relations on emergency notifications and news releases on an as-needed basis. An example of that good working relationship was ISU's addition of Ames Lab-specific information to their website during the flood of August, 2010 in order to get a broad dissemination of pertinent information.

Notable Outcome:

3A: Provide effective leadership for the BES portfolio at Ames, including response to FY 2009 peer review. (Obj. 3.2)

All actions resulting from the peer review in FY2009 were submitted in a timely manner and actions completed prior to the beginning of FY2010. In FY2010, a BES-DMSE triennial review of 6 BES-supported programs found that these projects have produced strong scientific results in topical areas that are relevant to the BES mission and well aligned with the core competencies. The outcome of this review was in general quite positive with 2 programs receiving modest support for expansion of their efforts. This triennial review was the first peer review of these programs since the Ames Laboratory DMSE was reorganized. In the cover letter detailing the results of the review, BES-DMSE commended the Ames Laboratory for the largely successful restructuring of these programs.

The FWP entitled "Homogeneous and Interfacial Catalysis in 3D Controlled Environment" in the CBS program was reviewed on-site in April 2010." The outcome of that review was received August 2010. The cover letter from Eric Rohlfing, the Director of the Chemical Sciences, Geosciences and Biosciences Division of the Office of Basic Energy Sciences included the statement that "Reviewer comments note the strong outcome from the previous period and promising prospects for the proposed research…". This letter also commended the "…excellent organization of the review process including the document preparation and the on-site presentations and meetings". Synergistic concerns about some of the research are being addressed by phasing out these areas by the end of CY2010. Funds for that work will be redirected to expand the program into new areas including the proposed efforts for Dr. Javier Vela, a 2009 joint recruitment.

The CBS FWP entitled "Chemical Physics" is undergoing a mail-in review. Review documents were submitted in second quarter of FY10 and the final outcome of the review is pending.

Overall Grade 3.0: **A**

Goal 4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory

This Goal evaluates the Contractor's Leadership capabilities in leading the direction of the overall laboratory, the responsiveness of the Contractor to issues and opportunities for continuous improvement, and corporate office involvement/commitment to the overall success of the Laboratory.

Highlights:

- The Laboratory successfully completed its search for a new CRO with the hire of Dr. Duane Johnson. Dr. Johnson has experience working within the DOE laboratory system and has outstanding credentials in computational material science research and management.
- An important component of the Laboratory's vision and its importance to the nation was demonstrated by Dr. Karl Gschneidner's testimony before Congress regarding the importance of rare earth materials and their underpinning of national security.
- The Laboratory has attained a leadership role in research involving iron arsenic materials.
- The Laboratory's strengths in developing computational strategies for materials discovery were enhanced with the hiring of Dr. Duane Johnson and with DOE funding to expand on these capabilities.
- The Laboratory continues to focus on process and facility improvement as evidenced by:
  - The implementation of business software to more effectively manage staff resources,
  - The completion of the records storage facility and the first phase of the access control system, both funded by ARRA,
  - The development of successful safe work practices to deal with beryllium characterization and clean-up, and
  - The enhancement of the personnel performance review process (to name a few).
- Laboratory Management became aware of the need for a formal process to identify and recover assets in the event of the death or unexpected departure of staff.
- The Contractor and the Laboratory completed the documentation of their contractor assurance process in response to the oversight and assurance reform efforts within DOE.
- The Contractor continued to add value by supplying monetary (scholarships, flu shots, etc.) and staffing (faculty leadership) resources to the Laboratory.
- The Contractor is aiding Laboratory management in the mission readiness process as management looks for solutions to address the gaps currently existing for housing computational resources and highly sensitive equipment in the aging infrastructure.

4.1 Leadership and Stewardship of the Laboratory (Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out Those Plans).

The Laboratory's 5-year scientific strategic plan was signed off on and became effective on October 1, 2009. Included in that plan is a revised mission:

> **The Ames Laboratory creates materials, inspires minds to solve problems, and addresses global challenges.**

And Vision:

> **The Ames Laboratory will be our Nation's premier research institute in critical areas of condensed matter science, its related technologies, and the strategic applications of advanced materials.**

In short, the Ames Laboratory "**Creates Materials & Energy Solutions**".

- With the plan in place, our management priorities this year focused on meeting our Objectives. For all upper management decisions related to our research we asked the question, "Will this decision help us meet our strategic goals?" White paper, pre-proposal and full proposal submissions to DOE are examples of decisions made based upon our strategic plan. Within the plan are metrics to measure our progress towards our goals. The metrics were tracked throughout the year and will be compared to those in subsequent years.
- The Laboratory's Vision, as well as its world renown rare-earth scientists, has placed the Laboratory at the forefront on the discussion of the US rare-earth materials issue.
  - Dr. Karl Gschneidner was invited to testify before a House Subcommittee Hearing on Rare Earth Minerals and 21st Century Industry on March 16, 2010.
  - An Article on Karl Gschneidner's testimony before congress on the potential rare-earth crisis received national media attention from the *Wall Street Journal, Huffington Post, New York Times, Popular Science, Chemical and Engineering News,* and *Physorg.com.*
  - From July 2000 (initial funding) through the end of FY2009, approximately one-third (128 out of 390+ worldwide) of refereed journal articles describing aspects of R_5T_4 rare-earth materials' physics where authored/co-authored by Ames Laboratory researchers funded through DOE.
  - Ames Laboratory researchers have created a consortium of research institutes, including ORNL, 3 Universities and an industrial partner to work on developing new non-rare earth magnets for traction motors.
- An outcome of the strategic planning process is that the Laboratory initiated two new research programs to further our key objective to "Attain the world-leading experimental, theoretical and computational research program and reputation in the discovery, design, synthesis, understanding and control of novel, sustainable materials". One program is in the area of molecular metamaterials and the other is in materials design and discovery utilizing computational approaches. These were given one year seed funding by BES – DMSE.
- The Laboratory's strong computational groups are developing software strategies to accelerate materials discovery. The targeted materials include strong magnets without the necessity of rare earths, better solar and photonic materials, and also better catalysts.
- Laboratory Management incorporated many of the aspects of its Strategic Plan into the DOE 2010 lab planning process. Feedback from DOE at the Laboratory Planning Meeting in June was positive and the Laboratory will focus on the approve plan for future activities .
  - Laboratory management is working on an Operations Strategic Plan that will enable the Scientific Strategic Plan.
  - The Strategic Plan provided the background for developing the Laboratory's Mission Readiness plan. Several scientific focus groups were convened to help address future facilities needs in order to carry out strategic science goals.
- Several new partnerships are under development with other Labs and Universities Including:

  Argonne National Laboratory
  University of Delaware
  Princeton Plasma Physics Laboratory
  North Dakota State University
  Sandia National Laboratory
  Pacific Northwest National Laboratory
  Brown University

- The Simulation, Modeling and Decision Science Program continues to grow its partnership with the DOE and Army. This group has won R&D 100 Awards in each of the last two years for these efforts as well as several Federal Laboratory Consortium awards.

4.2 Management and Operation of the Laboratory (Provide for Responsive and Accountable Leadership throughout the Organization).

- The Laboratory Director, select members of the Executive Council and the administrative managers participated in a team building seminar with the goal to improve interactions and to broaden perspectives for a more mission based approach to process improvement and customer service.
- The Laboratory Director has improved communication to/from his office with the Laboratory via Director's messages and an open door policy.
- The Laboratory initiated review of its proposal writing process, especially for larger competitions. The goal is to improve organization and cohesiveness in proposals and to communicate research goals more effectively
- Laboratory Management is directing the beryllium testing and clean-up operation. The draft beryllium status report was sent to AMSO in September, 2010. The characterization of beryllium has given Laboratory Management and the ESH&A office a much better understanding of the historical distribution of beryllium work within the Laboratory.
- Laboratory Management worked with Facilities Services to assure that the ARRA projects were completed on time, within budget and performed safely. The final phase of the project, the Access Control Upgrade, was completed September 17, 2010, two weeks before the end of the fiscal year.
- The Laboratory experienced the untimely death of one of its scientists. As a result, it became apparent that the Laboratory did not have a policy in place to account for the Laboratory's assets in the event of an unexpected departure. The Laboratory will develop a policy to address dealing with unexpected departures of personnel.
  - In late FY2010, management began a process of consultation to find what best practices exist at other labs and universities to address such situations.
- Revamped the professional and scientific performance evaluation process and form. Improvements were made to the performance review form and training was held to better equip supervisors to perform these evaluations and for staff to improve their expectations for effective performance reviews.
- The Laboratory continues to make progress in the business systems upgrade:
  - The Laboratory went live with a new personnel requisition/payroll projection/payroll distribution/labor and leave system on October 1, 2009. This was the second of four phases in the overall goal of updating the business systems and moving operations off of the HP3000.
  - The Laboratory is working to install new software to track training needs and accomplishments. This software ties into the HR database so that staff data is up-to-date and training requirements can be accomplished in a timely manner. This is the third phase of updating the business systems.
  - The Laboratory purchased Occupational Medicine patient software to replace the last major application to upgrade the business systems.
- The Laboratory has implemented an electronic signature process for travel expense report processing. This process allows for faster routing of forms and more timely payments. The process also facilitates remote access to the forms for approval.
- The Laboratory has been working with ISU staff to use the university's electronic document storage system. Using an established system will allow faster implementation and be more cost effective than having to create a separate system.
- The COO and Facilities Manager both participated on teams for Mission Readiness Peer Reviews. The Laboratory's Assistant Director of Strategic Planning (ADSP) was an observer at the TJNAF peer review which was the first scientist to participate at a review for a sister lab. The ADSP has agreed to be on the

SLAC Peer Review team next year which again will be the first time a scientist has participated on a team.

4.3 Contractor Value-added (provide Efficient and Effective Corporate Office Support as Appropriate).

- Contractor and Laboratory completed a Contractor Assurance Process in accordance with the terms of the contract. In addition to the oversight functions performed by the Ames Laboratory Oversight Board and the operations oversight performed by the Ames Laboratory Operations Review Committee, the contractor has appointed an Oversight POC to review plans and reports, and to coordinate all the oversight activities that occur within the University's functional areas at present.
- Contractor provides over $350K each year in tuition support for students working at the Laboratory. This support improves the University's and Laboratory's ability to attract top level graduate students.
- Approximately 60 faculty lead research at the Laboratory and get all or a portion of their 9-month salary from the Contractor.
- Contractor oversight board provides input to Laboratory scientific direction at the quarterly board meetings or more frequently as needed.
- The Laboratory Director and the Executive VP/Provost meet monthly to discuss coordination and contractor assurance issues.
- The Vice President for Research and the Laboratory Director meet monthly to identify common facility needs where joint projects may be beneficial.
- The University and the Laboratory jointly hired Dr. Duane Johnson as the Laboratory's new CRO. The University's participation allowed the Laboratory to develop a competitive offer to attract Dr. Johnson and allowed the Laboratory to win out over other offers.
- The University provides an annual flu shot clinic each year for all employees. Laboratory staff may receive flu shots at no cost to the employee or the Laboratory. This year the flu shot will include the normal flu vaccine and the H1N1 vaccine as well. This extra vaccine will nearly double the cost to the University.
- The University has purchased a Microsoft User Agreement that allows for upgrades of most Microsoft products. Currently the University pays for the agreement centrally so the Laboratory is able to stay current with its MS products at no cost to the Laboratory.

Notable Outcomes:

4A: Laboratory leadership will develop a strategic plan for the future scientific and technical activities of the Laboratory, which aligns with Office of Science and Department goals, and a detailed strategy for executing the plan during the next 2-5 years. (Obj. 4.1)

The Laboratory's 5-year scientific strategic plan was signed off on and became effective on October 1, 2009. Metrics were tracked through the year and will be compared to future years. Each objective of the plan includes a person responsible for achieving the objective. Detailed plans to achieve key objectives were worked on this year. In addition because facilities and operations are vital to the success of the science, Laboratory management is in the process of developing a operations strategic plan and science and operations managers are working together on mission readiness. The strategic plan formed the foundation of the 2010 Laboratory Plan and the Mission Readiness Plan which were presented and approved by DOE-SC.

4B: Laboratory leadership will provide a strategy for its Work for Others program including the future of the Midwest Forensic Resources Center; the WFO program should align with and support Office of Science, Department, and Laboratory goals. (Obj. 4.1)

The 2010 Laboratory Plan detailed the strategy and operating principles for the Ames Laboratory work for others program. The Plan was presented to DOE in June and a lively discussion on work for others ensued. The DOE has approved the strategy for work for others, including the Midwest Forensic Resources Center, and the Laboratory is continuing to pursue new partnerships with both other federal agencies and industry utilizing the Laboratory's unique capabilities in materials and materials processing.

4C: Laboratory leadership will make significant progress in defining and implementing its contractor assurance system. It is expected that a collaborative and uniform approach to this issue among all contractors will be evident. (Obj. 4.2)

- Contractor Assurance "H-Clause" was added to the contract in January.
- Laboratory and Contractor completed the "Ames Laboratory contractor Assurance system (CAS) Description" dated May 1, 2010.
- The Laboratory was represented on a working group of all the Office of Science labs to formulate guidelines and a peer review process in order to build some consistency into the various contractor assurance plans.
- The Laboratory's CA point of contact observed the ORNL peer review and served on the peer review team at the PNNL peer review.
- ISU named a contractor assurance POC who will review plans and reports, and coordinate all the oversight activities that occur within the University's functional areas.

4D: The contractor will fill all key leadership positions at the Laboratory in a timely manner. (Obj. 4.3)

Duane Johnson was hired as the Laboratory's new Chief Research Officer (CRO). Dr. Johnson has a diverse background in materials science and has worked within the Laboratory system and in the university community. The Laboratory offered a competitive startup package to compete against other offers by providing a joint appointment with ISU.

Alex King took on the additional duties of the acting CBS Program Director upon the untimely passing of the former CBS Program Director. New leadership for this program will be named shortly after the beginning of FY2011. In addition, the same individual was the leader of the Catalysis FWP. His death occurred less than a month after the on-site review. A national search is underway for new leadership for this area in cooperation with our contractor, Iowa State University.

Overall Grade 4.0: **B+**

Goal 5.0- Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environment Protection.

This Goal evaluates the Contractor's overall success in deploying, implementing, and improving integrated ES&H systems that efficiently and effectively support the mission(s) of the Laboratory.

Highlights:

- **Injury and Illness Statistics:** The Laboratory experienced one recordable staff injury and one additional injury to a subcontractor employee, both were also DART cases.
- **Beryllium Contamination Status:** Extensive beryllium survey sampling was conducted in Laboratory research buildings, and remediation activities were performed to ensure research activities, building maintenance, remodeling projects, and a subcontracted access control project were performed with adequate protection of workers. Additional information is documented with notable outcome 5B.
- **Safety Culture:** A recent safety survey indicates that Ames Laboratory employees have a high degree of satisfaction with the safety services provided by the Laboratory, as demonstrated by the average positive response rate of ~85%. The highest positive responses were noted for questions related to the Laboratory's efforts to identify, assess and correct hazards, and the level of safety education and training opportunities. This high level of employee awareness of and alignment with the Laboratory's principal safety elements is an indicator of a robust and supportive safety culture.
- **Work Planning and Readiness Review:** The Laboratory's readiness review process continues to provide a formal and thorough mechanism for work planning. Two groups from Sandia National Laboratory visited Ames Laboratory to learn about Ames Laboratory's success with this process.

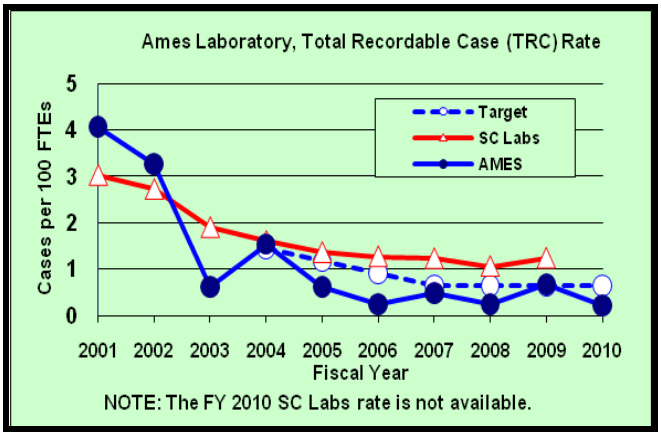
Awards:

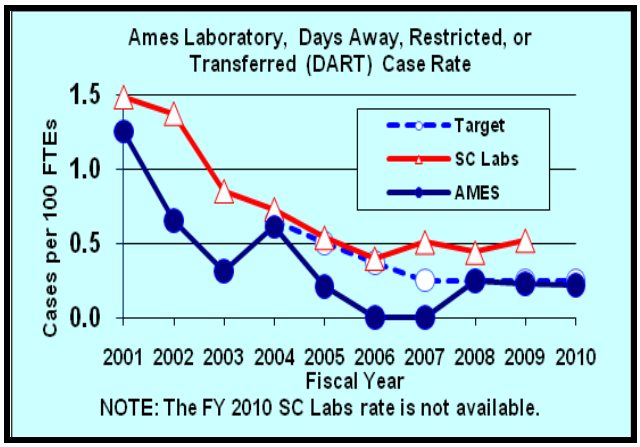
2009 National Safety Council Incident Rate Award	Recognized for having a rate below the NAICS (North American Industry Classification System) average.
National Safety Council (NSC) Expert Driver Certificate	The Expert Driver Certificate was awarded to the Ames Laboratory property management delivery person.
National Safety Council (NSC) Perfect Record Award	Recognition of operating over 1,000,000 employee hours (10/20/08 to 1/27/10) without an occupational injury or illness involving days away from work.
2009 Occupational Excellence Award from the National Safety Council (NSC)	Recognized for having an injury/illness rate that is 50% lower than the BLS (Bureau of Labor and Statistics) rate for the Laboratory's NAICS.
Industry Leader Award, National Safety Council (NSC)	Recognizes the top 5% of member companies, units and facilities that have met the criteria and qualified for the National Safety Council's 2010 Occupational Excellence Achievement Award (based on 2009 calendar year data). The Ames Laboratory received recognition as an Industry Leader by an NSC press release.

5.1 Provide a Work Environment that Protects Workers and the Environment.

The Ames Laboratory demonstrates successful protection of workers and the environment through low injury and illness rates, no reportable environmental incidents, and a comprehensive issue management program that identifies and addresses causal factors associated with low consequence events. Additional challenges were evident during FY2010 due to beryllium sampling and contamination control, and the facility-wide presence of subcontractor activities as part of the access control project.

- The Laboratory experienced one recordable injury to its staff and one additional injury to a subcontractor employee; both resulted in DART cases.
  - In June, an Ames Laboratory employee experienced a neck and shoulder strain when he avoided an imbalanced electronic cabinet as it toppled from a tailgate truck during its transfer to a dock. The injury resulted in seven restricted days of work.
  - In August, an employee of a subcontract firm working on an ARRA-funded project experienced a hernia.
- Total Recordable Case (TRC) rates and Days Away, Restricted, or Transferred (DART) case rates for the current and past years are reported below. These charts do not reflect the subcontractor injury in August 2010.





- The Laboratory did not experience any reportable occurrences related to environmental compliance during FY2010.
- Event tracking, categorization, investigation, and issue management continue to be performed according to documented procedures, and these processes provide assurance that potentially hazardous issues and causal factors are addressed.

5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management.

The Ames Laboratory successfully addressed this objective through the application of mechanisms described in its Integrated Safety Management System (ISMS) which ensure employees are trained, hazards are identified and mitigated, activities are reviewed and control mechanisms are applied, deficiencies and opportunities for improvement are identified and managed, and events are categorized, reported and trended. Additional challenges were evident during FY2010 due to beryllium sampling and contamination control, and the facility-wide presence of subcontractor activities as part of the access control project.

- Hazard identification and mitigation is performed as part of readiness reviews where activity supervisors and activity representatives are involved. The readiness review process continues to strengthen the Laboratory's safety program by fostering open communication and cooperative interactions by which activity supervisors and ESH&A lead specialists work together on the development of standard operating

procedures, verification of completion of training and resolution of any concerns prior to the research activity receiving operational approval. This process was recognized as an effective means of hazard identification and control during DOE audits in FY2010.

- Independent walk-throughs and topical appraisals were performed according to schedule, with significant involvement by upper management, Iowa State University, and DOE. Corrective actions are tracked to completion and checked for effectiveness.
- During FY2010, 198 classroom courses and 344 computer-based training sessions were offered. Completion statistics of mandatory courses continue to demonstrate the effectiveness of the Laboratory's training efforts. Training improvements were undertaken including benchmarking with other laboratories, selection and implementation of a new training management system (Cyber Train), and development of new courses.
- Employee interaction and feedback is an essential component of the Laboratory's safety program. As an example, ESH&A has been conducting quarterly safety forums with employees and specialists from Iowa State University's Environment Health and Safety Department in an effort to solicit feedback on potential areas of improvement for the safety program. While these gatherings have provided valuable information, ESH&A will be transitioning to other mechanisms that will more efficiently and comprehensively provide desired feedback. A recent electronic survey on safety culture provided insight on employee perceptions of the safety program and identified safety processes that are functioning well. The survey approach will be further evaluated and will have the additional strength of targeting specific categories of employees (e.g. Safety Coordinators & Representatives).
- A new electronic content management system is under development and will be in production during FY2011. This system will significantly enhance access to vital and eventually historical records.

5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention.

The Laboratory's waste management, waste minimization, and pollution prevention processes continue to perform effectively.

- Institutional training describes the practices for properly handling hazardous waste and minimizing waste generation as well as preventing pollution. Key messages include sharing chemicals, purchasing only what is needed, and recycling.
- New activities are reviewed for waste generation and pollution prevention through the Laboratory's readiness review process.
- Although the Laboratory will see a slight increase in its RCRA waste in 2010, the increase is due to the cleanout and relocation of an ISU program from Metals Development to a new ISU building. Due to an EPA interpretation of building ownership and waste disposal responsibilities, Ames Laboratory disposed of excess materials resulting from the relocation after reassigning some chemicals to other activities. Without the additional waste from this group relocation, Ames Laboratory 2010 waste levels would be at or slightly reduced relative to 2009 volumes.

The Laboratory continues to recycle or reuse white paper, computers/monitors and miscellaneous electronic equipment, phone books, fluorescent lamps, used oil, steel and other metal, batteries, Styrofoam peanuts, toner cartridges, and as of May 2010, corrugated cardboard. Also, the Laboratory participated in a recent Iowa State University "green-your-scene" week by collecting approximately 2400 pounds of mixed paper for recycling.

Notable Outcomes:

5A: Ames Laboratory will ensure that appropriate ES&H requirements are applied to 100% of subcontracts and are implemented at all levels to ensure that ARRA projects are performed in a safe manner. (Obj. 5.1)

Ames Laboratory has been involved with two ARRA projects: the Records Storage Facility (RSF) at the Warehouse and the Access Control Project. Through the Laboratory's contract work process for subcontracted work, the Laboratory established appropriate specifications, selected competent responsible contractors, and provided effective oversight through extensive daily interactions between the Ames Laboratory project manager and safety specialists, and subcontractor representatives.

- The RSF project included a limited scope construction project performed in the Laboratory's Campus Warehouse and a water supply upgrade, both with no potential interaction with the general Laboratory staff. Although the potential for exposure to hazards was minimal and the number of subcontractor employees was small, daily work site visits were performed to ensure contractors were meeting expectations. No injuries were experienced from this project.
- The Access Control Project was extensive, in that it impacted every building and nearly all employees and had potential for disruption of research activities. Daily briefings were held to communicate the scope of work, determine hot work requirements, and make arrangements with the Plant Protection Section for monitoring the fire protection system. Subcontractor employees were given safety orientations before working on the project. Work site visits were conducted multiple times during the day. Even during periods of extended work hours and a six-day work schedule, Facility Services and safety and security staff provided significant surveillance and project interaction activities. Laboratory employee questions and concerns were addressed quickly and appropriately. The net result of the oversight was that work progressed orderly, safely, and in accord with aggressive schedules. There were no significant negative impacts to Laboratory work as a result of the Access Control Project, although one subcontractor DART case was recorded.

5B: Ames Laboratory will conduct beryllium sampling and decontamination efforts with the utmost concern for the health and safety of employees and the public. Ames Laboratory will produce a close-out or status report by September 30, 2010, detailing the levels of beryllium contamination identified in Spedding Hall, the assurances of protection to workers and the public, and a summary of remediation accomplishments. (Obj. 5.1)

Ames Laboratory performed sampling and decontamination efforts of its research facilities throughout FY2010; and a draft status report was transmitted to the Ames Site Office in September 2010. The primary focus of the Laboratory's 2010 efforts was the continued assurance of the protection of current workers and the public. A secondary focus of sampling was to further document the extent and levels of historical contamination. Costs associated with the sampling and remediation activities were managed within the Laboratory's budget and with minimal disruption of mission priorities and schedules.

- DOE practices and lessons learned were examined from other sites including an on-site interaction with a DOE – NETL representative.
- The ISU Department of Statistics is being utilized to assist with the design of sampling plans and data analysis.
- Results and lessons learned from the Laboratory's experiences are being shared through conference presentations and journal articles.
- Sampling results suggest a fairly wide dispersion of airborne beryllium occurred (most likely in the 1950's and 60's) in Harley Wilhelm Hall as well as the west end of 2nd floor Spedding Hall and select areas of Metals Development. This dispersion resulted in beryllium surface contamination significantly above background levels. The sampling results also indicate this historical airborne dispersion resulted in surface concentrations marginally above background in additional areas of Spedding Hall and Metals Development.

- Personal and area air sampling results provided assurance of compliance with the established Permissible Exposure Limit (PEL) and confirmed that established internal dust control procedures were effective.
- Decontamination efforts were performed in areas of concern including vacuuming and, in some cases, wiping of surfaces including wall tops, light fixtures and cabinet tops. Follow up surface sampling was conducted to assess compliance with DOE-established release limits.
- Accordingly, the Ames Laboratory has had to reconsider its historical understanding of beryllium usage since the early 1950's (i.e. usages that were 1. infrequent and 2. in processes that would not result in either personal exposure or contamination of the work environment).
- The exposure potential to current workers, building visitors, and the public remains extremely low as the majority of the contaminated areas are not accessible to the general workforce and the public. The contaminated areas are periodically accessed by crafts people, but appropriate precautions are applied to ensure their safety, and personnel monitoring has confirmed the efficacy of the practices.
- Additional sampling and decontamination efforts are planned for FY2011 and perhaps beyond, with the goal of furthering the understanding of historical contamination at the Ames Laboratory and improving the protection of workers.

5C: Ames Laboratory will demonstrate improvement in their Environmental Management System by incorporating 100% of the findings from the Independent Review by September 30, 2010 (Obj. 5.2)

The Laboratory's Environmental Management System (EMS) continues to mature through process improvements resulting from reviews, and through the formulations and achievement of applicable targets and goals.

- The Laboratory has fully incorporated 100% of the findings from the Independent Review and the improvements have enhanced the Laboratory's EMS Program. CY2009 Environmental Management System (EMS) targets/goals were met or exceeded; the EMS Steering Committee formulated new targets/goals for CY2010; upper management approved and communicated the CY2010 EMS targets/goals: and the results to date indicate acceptable performance.

Overall Grade 5.0: **A-**

Goal 6.0- Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

This Goal evaluates the Contractor's overall success in deploying, implementing, and improving integrated business systems that efficiently and effectively support the mission(s) of the Laboratory.

Highlights:

- The Laboratory met all the additional requirements placed upon ARRA projects. The various ARRA reports were submitted as required. Purchasing updated T&C clauses for contract requirements and worked with their subcontractors to gather job information that was later required by DOE. Internal Audit modified audit procedures to review the additional ARRA requirements. Risk statements were updated to review the ARRA requirements and related controls.
- Implementation of new payroll/timekeeping system began on October 1, 2009. Easier retrieval of payroll data at the detail level has been one area of improvement. Electronic submission and approval of vacation requests is another added-value feature and electronic submission of time certifications allows for streamlined information processing.
- New travel policy was implemented. New policy gives travelers more options for individualized travel planning.
- The Laboratory is blazing new territory in its effort to "sell" an old extrusion press. The final agreement will be unique in that it will consist of a sales contract and construction contract with internal Ames Laboratory employees and subcontractors paid by the Procurer to perform restoration of the vacated space.
- The staff of Property Management has filled in for a staff member suffering from a long-term illness. Since there is a total of seven staff, covering for one is a major undertaking.
- A complete set of Terms and Conditions was updated by the Laboratory and approved by the Contracting Officer. That's the first time ever that all the T&Cs were updated at the same time.
- The new contractor assurance process was completed and resulted in the enhancement of the issues tracking system. Major business related issues are tracked to resolution.
- Successful implementation of new payroll/timekeeping system beginning October 2009. The ability to retrieve detailed payroll information in a time-efficient manner exhibits measurable improvement in the payroll system due to the implementation.
- The QA review found two best practices and 2 Level 3 findings.
- Three Ames Laboratory researchers (lead-free solder follow-on work with Nihon Superior and VE-Suites with NETL) won 2010 National Federal Laboratory Consortium Excellence in Technology Transfer Awards and 3 Ames researchers (BAM-Tb) won a 2010 FLC Midcontinent Region Excellence in Technology Transfer Award.
- Two researchers won new ISU technology transfer awards. Tom Barton received the first ISU Award for Achievement in Economic Development in Iowa, and Iver Anderson won the first ISU Award for Achievement in Intellectual Property.
- Invention disclosures (19)and patent applications (17)reached an all time high in FY2010.

6.1 Provide an Efficient, Effective, & Responsive Financial Management System(s).

Electronic Processing of Payroll data: As of October 1, 2009, Ames Laboratory implemented the new CostPoint/Enterprise Planner timekeeping/labor distribution modules for payroll tracking. As part of this software deployment, the time certification process was revised so that supervisors of record would directly submit their responses/certifications electronically to a centralized e-mail location. To improve understanding about new time certification process, the accounting department developed a brief training module to instruct supervisors in "best practices" when responding to this monthly data request. Two "live" training sessions were presented to supervisors. A permanent web-based presentation will be posted so that the supervisors can access this information at their convenience. In addition, many of the timekeeping functions have been transferred to an electronic format. Movement toward direct electronic entry of all timesheets/vacation requests is a goal for the future.

Travel: Implementation of the new travel policy began with the new fiscal year. Allowing travelers new options for booking travel creates greater flexibility for the traveler. Adjusting travel receipt documentation requirements has reduced paperwork for traveler. The Laboratory negotiate a new car rental agreement. This is the first time the Laboratory has had its own agreement and the rates are lower than previous agreements offered by other labs.

Accounts Payable: Process improvement included a review of AP requisition procedures. Documentation changes allow for reduced paperwork for payment processing. Review of payables procedures will be an on-going process.

Grade: **A-**

6.2 Provide an Efficient, Effective, & Responsive Acquisition Management System.

Purchasing and Property Management is completing a year full of change. The former Purchasing Manager and Property Manager retired December 31, 2009 and the new Manager has focused on learning the intricacies of DOE procurement and property management.

Purchasing staff changes included replacement of a buyer/small business liaison. Having two new employees in a staff of four requires a lot of focus on training and just getting back to whole. The Purchasing Manager placed a special emphasis on cross-training and empowerment in order to improve customer services and efficiencies. Time was spent updating terms and conditions sets, getting to know the new Contracting Officer (CO), and working to enhance the review and approval process with the CO for requisitions. ARRA and normal purchase orders contained all the required flow-down requirements. Efforts to place ARRA subcontracts took special attention due to the difficulties presented by building contamination. Purchasing had to process bid documents quickly due to limited time remaining in the year. Thankfully the bids came in lower than expected and the vendor performed admirably. The Purchasing Manager developed a good working relationship with the ARRA subcontractors in order to guarantee performance and compliance with the ARRA Ts & Cs. Purchasing anticipates meeting 12 out of 13 Balanced Score Card Measures. The Purchasing website was enhanced by consolidating the new travel policy and guidance statements in one place. Purchasing and Finance worked to implement a plan to decrease the amount of paperwork needed to affect a decrease in the value of a requisition, purchase order and subcontract. Purchasing has also been instrumental in the front end talks and document preparation for the removal of the extrusion press. DOE-CH has approved the sale/removal. Once the contracts get put in place with the Buyer and the press is successfully removed, we will be able to regain valuable space currently occupied by the press.

Grade: **A-**

6.3 Provide an Efficient, Effective, & Responsive Property Management System.

The property management team has been short one staff member (out of seven) throughout several months of 2010 due to the long-term illness. The team has worked diligently on providing customer service during this time and stepping into new roles in order to complete all tasks required. Essentially, the ill person was the backup for the other six staff so he had proper driving certifications for transporting the types of hazardous materials present at the lab, and he had knowledge on performing all the other jobs (stores, ordering, shipping, receiving, property management). The new manager completed Ames first transfer through the ERLE program and facilitated a successful capital inventory. It is anticipated for property management to meet all of the Property Balanced Scorecard Measures. Plans for 2011 include leading a workshop to improve internal precious metals inventory practices in response to an audit finding.

Awards:

Schulke, Keith	National Safety Council (NSC) Expert Driver Certificate	The Expert Driver Certificate was awarded to the Ames Laboratory property management delivery person

Grade: **A-**

6.4 Provide an Efficient, Effective, & Responsive Human Resources Management System & Diversity Program.

- Full Implementation of ISU's new compensation structure for Professional and Scientific (P&S) staff which has been under development since 2007. The methodology for the new structure included identification of 138 benchmarked positions (of which 33 exist within Ames Laboratory) and the evaluation of market competitiveness of these positions. The result was the implementation of a new pay structure which includes 12 pay grades instead of 10 and the re-slotting of all P&S positions into the new pay grades. The Assistant HR manager was an integral part of the implementation team which brought this project to fruition.
- Implementation of a revised performance review form for Professional and Scientific staff for the review period of CY2009. The previous performance review form had not be evaluated since 1999. It was revamped and converted to a more efficient and user friendly format. As a result, 94% of all P&S staff received a performance review in 2010 which exceeded the previous year's 91% completion rate.

Both of the highlights for Human Resources reflect continuous improvement and deployment of new programs and initiatives to better support the Laboratory staff. Continuous improvements will continue with the implementation of e-appraisal, a recently purchased software program which will fully automate the performance review process in FY2011.

Grade: **A-**

6.5 Provide Efficient, Effective, & Responsive Management Systems for Internal Audit & Oversight' Quality; Information Management; & Other Administrative Support Services as Appropriate.

Audit

- ARRA monies are verified as appropriately administered, according to Contract requirements. ARRA costs are reviewed to assure reasonableness and correct allocation to project costs.

- Audit has verified appropriate flow-down of terms and conditions to first tier subcontractors to date, as required by Contract CH11358. Audit has set up the structure to continue to verify the other key components of ARRA money stewardship at Ames Laboratory. This will be the subject of a subsequent Audit Report. To date, no reportable exceptions have been noted.

- Improved operations from a control standpoint, as well as from an economy and efficiency standpoint:
  - Audit has verified that the new time certification system as recommended by Audit is working as intended in providing enhanced control over certification of labor costs incurred. The mode of implementation was paperless, saving environmental resources as well and streamlining a heretofore paper-intense process.
  - Travel policies have been updated and component processes reevaluated and streamlined, as catalyzed primarily through a committee team approach including Management and Audit input.
  - Audit continues to indicate areas of opportunities for enhancement of internal controls. In recent audit drafts the following items have been discerned for improvement in controls:
    - Key employee compensation changes process
    - Delegation of Signature authority process
    - Inventory processes enhancements related to rare earth metals
    - Laboratory Notebook process enhancements
    - Construction Work in Progress enhancements to accountability and reconciliation processes.
  - Audit continues to verify the adequacy of action taken in response to prior audit reports. In Fiscal 2010, fiscal year to date, 15 corrective actions have been closed.

Oversight

Oversight activities were strengthened by the completion of the University's and Laboratory's completion of the "Contractor Assurance System Description." In addition to the activities of the Oversight Board and the Operations Review Committee the university has named a Contractor Assurance POC to be the clearinghouse for Laboratory reports and plans, and to coordinate oversight activities performed by the various university functional areas.

Quality Assurance

A Quality Assurance assessment occurred in August 2010. The conclusion of the assessment was that the Laboratory's QA program was effectively implemented and the team identified 2 strengths, no Level 1 or Level 2 findings and 2 level three findings. Strengths included the improvements being made to the training and purchasing systems by moving to electronic systems, and the documentation found on engineering projects. Level 3 findings encouraged the development of QA training, and more consistent and complete documentation (various examples in report).

Information Management

- Completed effort with the Cyber Train team in preparation for implementing the Employee Training module. Deployment is planned for FY2011. It is important to continue to move applications off the HP3000 to satisfy cyber security requirements.
- Significant progress occurred on the planned deployment of the new Ames Laboratory web site on October 1, 2010, which will showcase the Ames Laboratory research effort and operations function.
- Purchased new application server to accommodate Maximo v7. The latest Maximo software release for service areas (work orders, service requests), scheduled to be implemented by September 30, 2010 was delayed. It will provide an enhanced electronic mechanism for submitting and tracking service area tasks. Plans are to implement the release the first half of FY2011.

The Information Systems staff completed several additional projects that contributed to meeting this objective. The Occupational Medicine team was assembled with the goal of evaluating and selecting software to replace the application currently residing on the HP3000. After evaluating the Request For Proposal (RFP) responses from four vendors, the most cost effective solution that best met the requirements was selected. Efforts to

implement the software will occur in FY2011. Three minor applications remain on the HP3000 and plans are underway to convert these applications. Server and storage hardware was purchased to upgrade the Deltek business systems. The current hardware was purchased in FY2004. Virtualization of the storage and applications and clustering of all production databases (CostPoint, Cognos Reports and Enterprise Planner, Cyber Train, subsidiary databases) will enhance the availability of the business applications. Testing and deployment is anticipated in FY2011. Network Infrastructure enhancements consisted of DNSSEC zone signing and a simpler, secure mechanism for allowing visitor network access from conference rooms.

Awards:

Sears, William	2010 DOE Cyber Security Award for Innovative Achievement in Collaboration
Zaruba, Charles	ISU LAS P&S Award for Excellence in Information Technology

Public Affairs

- Public Affairs received a Gold Award from the council for Advancement and Support of Education District VI for Excellence in Institutional Relations for its “institutional Branding Campaign.” Graphics received a Bronze Award for Excellence in Graphic Design for the development of the Lab’s new logo.
- Public Affairs went partially green with its *Insider* newsletter by providing employees the option of receiving the publication via email instead of paper. This decision follows a recommendation from the Lab’s Environmental Management Steering Group to reduce paper consumption at the lab. Approximately 25% of the Laboratory’s employees now receive *Insider* electronically.
- Public Affairs developed a Strategic Communications Plan that was approved by the Director and DOE-Chicago. This plan resulted in many efforts to address communications and responsiveness to customer needs. Some highlights include:
  - Began developing "Ames Lab 101” videos on Laboratory research. Videos include short, one-minute synopses of active research projects that are explained by scientists themselves. Videos are made available to media and the public. Video on Ames Laboratory's rare- earth research appeared on Secretary of Energy Steven Chu’s Energy blog. Other videos now appear on YouTube and the Ames Laboratory website.
  - Hosted media visits from reporters at *Iowa Public Radio* and the *Ames Tribune to educate them on the research mission of the Laboratory*. The *Ames Tribune* visit resulted in stories in local newspaper.
  - Developed three large-scale display pieces to honor Black History Month, Women in Science and Technology month and National Hispanic Heritage Month.
  - The Laboratory director and the manager of the Laboratory’s Environment, Safety, Health and Assurance office participated in a broadcast on “The Exchange” radio program, which was devoted to discussing the former worker compensation program.
  - Hosted a group of nine Iowa legislators who toured research at the Lab. Legislators were members of the House and Senate Economic Growth committees. Visit was designed to show how Ames Laboratory contributes to economic development in Iowa.
  - Hosted numerous tours by high school and undergraduate students who viewed research at the Laboratory and toured facilities. Some examples included undergraduates with the Iowa Mathematics and Science Academy a the University of Northern Iowa, physics students from North Polk High School, elementary students from Meeker Elementary in Ames, and members of the Materials Advantage Club at Iowa State University.

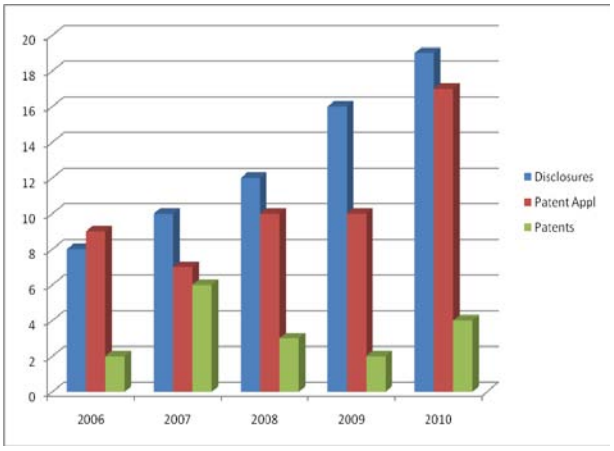
Awards:

Luhmann, Grant	Council of Advancement and Support of Education District VI Institutional Awards Program – Bronze award in Excellence in Graphic Design: Single logo
Karsjen, Steve	Council of Advancement and Support of Education District VI Institutional Awards Program – Gold award in Excellence in Institutional Relations: Institutional Branding Campaign

Grade: **A-**

6.6 Demonstrate Effective Transfer of Technology & Commercialization of Intellectual Assets.

- Sales of lead free solder have generated over $31M in royalties to its inventors, Ames Laboratory, ISU and the US Treasury. One of the licensee's of the technology continues to work with Ames Laboratory under the WFO mechanisms to improve the characteristics of the solder as well as developing new applications for the product.
- Two of the five of DOE Laboratory winners of the 2010 Federal Laboratory Consortium's National Excellence in Technology Transfer Awards were Ames Laboratory innovations.
- The Laboratory worked closely with the DOE-CH Patent Counsel to develop a customized MOU and IP Agreement to protect and bundle intellectual property developed under the DOE EERE funded project aimed at creating new non rare earth magnets for traction motors. The MOU is currently being routed to the partners for signatures; once signed the IP Agreement will follow.
- The CRADA between Ames Laboratory, Eaton and Greenleaf developed cutting tool and hydraulics that will utilize a boron aluminum magnesium material licensed exclusively to New Tech Ceramics. Plans are to have the more efficient products in the marketplace in FY2011. This partnership was the recipient of a 2010 FLC Midcontinent Region Excellence in Technology Transfer Award.
- Disclosures, Patent Application and Patents for FY2010 continued to increase (see chart below); disclosures are up approximately 20%, applications up 70% and patents up 200% from FY2009.



- D. Covey served on the DOE's TTWG Executive Board as recording secretary for a second consecutive year in FY2010.
- D. Covey serves as the Federal Laboratory Consortium's Midcontinent region Deputy Coordinator. Her term expires June, 2011.
- With funding through an ISU Women's Enrichment Grant, a series of seminars, aimed at engaging women and minorities in intellectual property, technology transfer and entrepreneurship, was held. Attendees were from Ames Laboratory, ISU and the Ames community.

- Ames participated in a DOE trial customer survey using Survey Monkey in FY2010. Eight requests were emailed to companies or other federal agencies who had completed WFO agreements asking them to participate in the survey and two (2) responses were received. Overall, the customer surveys rated the Laboratory satisfied to extremely satisfied on the administrative as well as the technical performance.

6. Overall Satisfaction Please rate your overall satisfaction with the Laboratc regards to this project.

	Extremely Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Extremely Satisfied	N/A	Rating Average
Overall Satisfaction	0.0% (0)	0.0% (0)	50.0% (1)	50.0% (1)	0.0% (0)	0.0% (0)	3.50
Contract terms & conditions	0.0% (0)	0.0% (0)	50.0% (1)	0.0% (0)	50.0% (1)	0.0% (0)	4.00
Value of the project to your company	0.0% (0)	0.0% (0)	50.0% (1)	50.0% (1)	0.0% (0)	0.0% (0)	3.50

9. Technical or Scientific Staff Performance: Please rate how satisfied you ar the technical/scientific staff performance in each of these areas:

	Extremely Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Extremely Satisfied	N/A	Rating Average
Timeliness	0.0% (0)	0.0% (0)	50.0% (1)	50.0% (1)	0.0% (0)	0.0% (0)	3.50
Responsiveness	0.0% (0)	0.0% (0)	50.0% (1)	50.0% (1)	0.0% (0)	0.0% (0)	3.50
Helpful interactions/communications	0.0% (0)	0.0% (0)	50.0% (1)	50.0% (1)	0.0% (0)	0.0% (0)	3.50
Technical/scientific knowledge of subject matter	0.0% (0)	0.0% (0)	50.0% (1)	0.0% (0)	50.0% (1)	0.0% (0)	4.00

Awards:

Bryden, Mark McCorkle, Doug	2010 Federal Laboratory Consortium's National Excellence in Technology Transfer: VE-Suite (joint with NETL) R&D 100 Award: osg Bullet
Anderson, Iver	Federal Laboratory Consortium's national Excellence in Technology Transfer: Lead free Solder ISU Award for Achievement in Intellectual Property (1st recipient)
Cook, Bruce, Harringa, Joel Russell, Alan	2010 FLC Mid-Continent Excellence in Technology Transfer Award: BAM-Tb
Barton, Tom	ISU Award for Achievement in Economic Development in Iowa (1st recipient)
Lin, Victor	ISU LAS Award for Achievement in Intellectual Property (1st recipient)

Grade: **A-**

Notable Outcomes:

6A: Ames Laboratory will ensure that its new Prime Contract Clause H.41-Special provisions relating to work funded under American Recovery and Reinvestment Act of 2009 (Feb 2009) will flow down to all subcontracts over $25,000 that are funded in whole or in part by the Recovery Act (unless the subcontract is with an individual). (Obj. 6.2)

- The Laboratory has issued 4 subcontracts funded from the Recovery Act and all four subcontracts contained the flow-down provisions of H.41.
- The Laboratory reviewed the requirements in Clause I.33 for new ARRA requirements. No changes to existing subcontracts were required.
- The ARRA project was completed by September 20, 2010. No new subcontracts will be written on ARRA funds.

6B: Ames Laboratory will complete IM projects (which includes the Payroll/Leave portion of Deltek) as identified in the FY2010 IM plans and demonstrate measurable improvement, and the FY 2011 plans are in place by September 30, 2010. (Obj. 6.5)

- The FY2010 IM plan was prepared and strategies in place by September 30, 2009 with four goals identified in the FY2010 plan. Progress was made on all projects identified in the FY2010 IM plan. The FY 2011 IM Plan was in place by September 30, 2010.
- The Payroll/Payroll Projection and Timekeeping modules were implemented October 1, 2009. Information retrieval from the new system greatly enhanced Accounting's ability to reconcile data. Processes are functioning correctly. Minor issues were identified and corrected. This effort completes a major milestone for converting applications off the HP3000.

6C: Ames Laboratory will disclose each subject invention to DOE Patent Counsel within two months after the inventor discloses it in writing to contractor personnel responsible for patent matters. All invention disclosures should be submitted through the I-Edison system and be accurate and complete. (Obj. 6.6)

Invention disclosures reached an all time high in 2010. The Ames Laboratory and ISURF received 19 invention disclosures between the reporting period Oct 1, 2009 – Sept. 24, 2010. All disclosures have been reported to DOE within 60 days from disclosure to ISURF through i-Edison except for 3 received the week of 9/20/10 which are currently being processed. One disclosure was not received until ISURF was doing a search of the USPTO database for issued patents and came across a patent that had been issued to Los Alamos National Laboratory. LANL, as well as the Ames inventor, failed to notify Ames Laboratory and ISURF that they had a disclosure involving Ames. Subsequently, an invention disclosure was completed by the Ames Laboratory inventor and filed with ISURF and through i-Edison.

Overall Grade 6.0: **A-**

Goal 7.0- Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs.

The contractor provides appropriate planning for, construction and management of Laboratory facilities and infrastructures required to efficiently and effectively carry out current and future S&T programs.

Highlights:

- Completed the ARRA project, Infrastructure Upgrades, on schedule and within budget. The infrastructure project created a records storage area within existing warehouse space that meets the DOE requirements to protect and secure such documents. The project also installed a new access control system that replaces an obsolete system nearly 20 years old and replaces the mechanical keying system in a significant portion of the facility. The project met the completion milestone in spite of the challenges and complications created by the discovery of beryllium contamination in areas that affected the installation of the access control system.
    - Additional GPP funding was allocated to continue the Access Control project.
    - ISU completed a second water line to feed the Laboratory support buildings. This line will increase the water pressure for that part of campus and will provide redundancy for water service.
- Incorporating the Assistant Director for Scientific Planning into the Mission Readiness assessment meetings with program personnel to provide an even stronger tie between scientific plans and facilities and infrastructure plans. The AD was the first scientific person to attend a peer review and is the first to be invited to serve on a peer review team.
    - The Mission Readiness process was utilized to produce the 10-Year Site Plan section of the Laboratory Plan.
- Planning has started for upgrading the Laboratory's auditorium. The upgrades will provide distance learning capabilities funded by a WFO project within the MFRC.

7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage, Minimizes Life Cycle Costs, and Ensures Site Capability to Meet Mission Needs.

Facilities and Infrastructure continues to be managed efficiently and effectively. Management continues to invest in maintenance efforts in accordance with DOE guidelines. The excellent condition of the facilities demonstrates the effectiveness and efficiency of these efforts, especially since the average age of the research facilities is 56 years. Deferred maintenance continues to be maintained at a very low level. Facilities personnel worked closely with scientific and operations stakeholders to provide facilities and infrastructure that support mission needs within the limitations imposed by 50 year old research buildings. As part of the mission readiness process, the Manager of the Facilities Services Group, the Chief Operations Office and the Assistant Director for Scientific Planning met with representatives from each scientific program and Operations Department to assess both current capability and future needs. The results of this collaboration were incorporated into the Annual Laboratory Plan. The 2010 FY Executable Plan Update specified Performance Goals for FY2010; all four of these goals were completed.

There are two key foundational elements to the effective management of Ames Laboratory facilities and infrastructure. First, there is a very close working relationship between Laboratory Management, Facilities

Services personnel and building occupants. Second, all of these stakeholders have a very good knowledge of space requirements, facility capabilities and facility conditions.

7.2 Provide Planning for and Acquire the Facilities and Infrastructure required to support the continuation and Growth of Laboratory Missions and Programs.

The Laboratory continues to evaluate facility capabilities and needs in order to plan for the facility and infrastructure improvements needed to support the Laboratory's missions and programs. Planning is especially challenging because the funding schedule for the SLI facility modernization program continues to be adjusted. Facilities personnel worked closely with scientific and operations stakeholders to provide facilities and infrastructure that support mission needs within the limitations imposed by 50 year old research buildings. In FY 2010, as part of the mission readiness process, meetings were held to identify and document the current & future needs of the research programs. The results were incorporated into the Annual Laboratory Plan as well as in Field Budget requests and IFI Crosscuts. With the change in the projected funding schedule for the SLI project, the Laboratory has begun to investigate alternative plans for meeting the most critical needs with a scaled down project that may be a better fit to funding resources. In the absence of line item funding, the Laboratory continues to make effective use of capital improvement and overhead funds to maintain and update facilities to meet the needs of occupants. For example, the Human Resources office was reconfigured to provide greater privacy for small conferences and a more effective and efficient work environment, and plans are currently underway to reconfigure and modernize existing conference/meeting space in Spedding Hall.

Notable Outcomes:

7A: Ames Laboratory will manage the ARRA project to keep it within budget and on schedule. (Obj. 7.1)

- Records storage project is complete.
- Water improvement project for the support buildings on the north part of campus is complete.
- Access Control project is complete. The funding for this project was not adequate to install the access control upgrade in all buildings. The Laboratory allocated some GPP to continue work on the project and will utilize future GPP funds to complete the project.

Ames Laboratory completed the ARRA project, Infrastructure Upgrades, on schedule and within budget. The infrastructure project created a records storage area within existing warehouse space that meets all of the DOE requirements to protect and secure such documents and installed a new access control system. The project met the completion milestone in spite of the challenges and complications created by the discovery of beryllium contamination in areas that affected the installation of the access control system. In order to deal with the contamination issues, the project utilized a partnership between sub-contractors and in-house personnel. In-house personnel were utilized to rough in wiring in locations where special procedures and precautions were required because of the potential for beryllium contamination. In-house personnel worked closely with ESH&A personnel to make sure that work was done safely. With this work completed, the sub-contractor personnel were able to work using normal construction practices. This allowed the project to proceed on a very aggressive schedule for the installation of the access control system. The access control system required very extensive coordination efforts because it included work in all of the occupied buildings and affected a large number of laboratories and offices. Feedback from buildings occupants and Laboratory management indicated that occupants were generally well informed and that the disruption from the construction activities was kept to a minimum. This coordination effort was effective in large part due to a very good working relationship among the project team of the Architect/Engineer design team, the sub-contractor and Ames Laboratory project management personnel.

7B: Ames Laboratory will complete the implementation of the Mission Readiness plan and incorporate the results into the Facilities and Infrastructure section of the Annual laboratory Plan. (Obj. 7.2)

- COO, CRO and Facilities manager conducted interviews with scientific and operations staffs regarding facility needs to support the Laboratory's mission. Input was used to update the 10-year site plan contained in the Annual Laboratory Plan.
- COO and Facilities manager observed the Argonne MR peer review.
- Facilities manager was a member of the PPPL peer review team.
- COO was the COO representative for the TJNAF peer review team. Acting CRO was an observer at the TJNAF peer review. She was the first CRO from any Laboratory to do so. She has been asked to serve on the SLAC Mission Readiness Peer Review team.
- The PPPL and TJNAF reviews offered a number of ideas to enhance the Laboratory's processes. These will be reviewed for inclusion over the next year.

Ames Laboratory is utilizing a mission readiness process in assessing facility capability and planning for improvements to meet future mission needs. The scientific program participation included the Program Directors and key research personnel as selected by the Program Directors. These discussions and assessments looked at current capabilities, needs in 5 years and needs in 10 years. The results of this collaboration were reviewed by laboratory management and incorporated into the Annual Laboratory Plan. The Mission Readiness process also calls for the various Laboratories to participate in peer reviews of each other to add comparability between labs and to familiarize participants with best practices used at other laboratories. This year all three management officials, listed above, observed mission readiness peer reviews at other Laboratories and the Manager of Facilities and the COO participated on peer review teams. The AD for Scientific Planning was the first director in a scientific position to observe a peer review outside their home laboratory and was the first to be asked to participate on a peer review team.

Overall Grade 7.0: **B+**

Goal 8.0- Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems.

This Goal evaluates the Contractor's overall success in safeguarding and securing Laboratory assets that supports the mission(s) of the Laboratory in an efficient and effective manner and provides an effective emergency management program.

Highlights:

- The Ames Laboratory has drafted a COOP and is in the process of incorporating DOE comments. The COOP will be updated, approved, and fully executable in FY2011.
- A program requirement has been established for annual training on privacy and data protection policies for all employees.
- Ames Laboratory participates in the Argonne National Laboratory Federated model, an information sharing network between Office of Science labs which facilitates the rapid communication of emerging threats against the Office of Science complex and supports automated response to these threats.
- The Cyber Security program continues to meet or exceed the requirements outlined in DOE Order 205.1A, The Department of Energy Cyber Security Management Program.
- The Cyber Security Team meets the Milestone Completion Dates on schedule for the goals listed in the Plan of Action and Milestone (POA&M), and continuously monitors for additional opportunities for improvement in the program.
- The Ames Laboratory was recommended for renewal of Authority To Operate (ATO).
- The Laboratory's efforts to protect sensitive information were acknowledged by the Counterintelligence Office of DOE. The Laboratory's cyber staff has been working with the CI Cyber representative to implement tools to facilitate added protection of the network.
- Added emphasis was placed on providing better foreign trip reports. The Laboratory's CIO acknowledged improvement in the reports and will work with the Laboratory to improvement the awareness of the staff as to the importance of well written trip reports.
- The Laboratory reviewed hosts to better align visitors and their responsible hosts, and the CIO acknowledged that hosts are better able to provide the information to support CI efforts.

Awards:

Sears, Bill	2010 Cyber Security Award, Innovative Achievement in Collaboration	The award was presented to the NSM Executive Committee in which William Sears was a member, in recognition of superior dedication and tireless efforts to foster collaboration and community awareness of new cyber techniques, capabilities, and solutions to strengthen the DOE cyber security posture.
Zaruba, Charles	ISU LAS P&S Award for Excellence in Information Technology	

8.1 Provide an Efficient and Effective Emergency Management System.

The Laboratory's emergency management system continues to perform effectively.

- No unusual emergency management incidents have impacted the Laboratory's mission success or success in maintaining effective emergency planning.
- There are currently no open corrective actions associated with emergency management.
- Training and annual self assessment requirements have been fulfilled, and a table top exercise was conducted.
- The Laboratory's Event Reporting Program ensures that events are mitigated and reported, and provides screening and evaluation tools for all types and severity of events, not just emergency management events. Such thorough application of the Event Reporting Program makes it less likely that an emergency will occur, as latent institutional problems are being identified and corrected.
- Seventy-four (74) events were categorized in FY2010, including fifty-seven (57) Ames Local events, eleven (11) Not Reportable events, five (5) ORPS Reports and 2 CAIRS Reports (one event was reported as both an ORPS and CAIRS Report). Of the fifty-seven events, 25 were considered to be Ames Local-ISC events. No events were considered significant enough to require reporting beyond notification of the Ames Site Office.

8.2 Provide an Efficient and Effective System for Cyber-Security.

The Laboratory's Cyber Security System continues to provide effective and efficient controls to address known hazards. FY2010 activities include the following.

- Cyber Security Walk-throughs were performed and continue to provide an opportunity for the Cyber Security Manager to discuss cyber concerns and issues with each research program and administrative department. Minor issues were identified and resolved on two systems in the Administrative offices. Minor issues were identified on Research staff systems and resolved during the walkthrough.
  - In FY2010, the export control manager was included in the preplanning discussions.
- Configuration management was enhanced through increased virtualization of cyber systems.
  - VMWare vSphere was purchased to provide high availability and non-hardware dependent backup solution of server systems.
  - Two storage units were purchased to provide central redundant storage access for VM hosts and guest servers.
  - Two servers were purchased to consolidate and provide high availability server systems.
  - Virtual machine hosts were reviewed to ensure adequate resources are available for virtualization. Virtual machines allow migration and recovery of systems regardless of hardware and ability to transition from physical systems which will reduce the amount of power and heat generated.
- Access Control was supported through implementation of wireless access improvements.
  - Wireless access for guests and visitors is no longer encrypted to facilitate usability.
  - A new external network for employees with Personal Wireless Devices was implemented. This fills the gap between Wireless Visitor access and Wireless access with Laboratory property.
- An outbound web proxy service was implemented.
  - Major barrier for stopping the outbreak of cyber incidents this spring by blocking suspicious content and ads.
  - Web proxy hardware was configured. One device is deployed and is filtering all non-secure web access.
- Continuous monitoring is provided through full vulnerability scans, including all Nessus plugins, and are conducted daily. All moderate and high vulnerabilities are remediated. Vulnerability scans were revamped to provide smarter scanning, as systems are scanned using relevant plugins. False Positives generated by Intrusion Detection Sensor (IDS) systems were reduced through constant review of IDS signatures.
- One Cyber Security employee completed Tracerfire training and three Cyber Security employees completed SANS OnDemand training.
- There were 22 incidents reported to DOE-CIRC.

- 15 incidents during March – May. The majority of these incidents were the result of malicious web ads.
- Zero incidents during June – August. The web proxy aided in preventing additional incidents.

8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property.

The Laboratory's processes to protect special nuclear materials, information, and property continue to perform effectively. Ames is appropriately defined as a Threat Level 4 site per DOE Design Basis Threat guidance. A graded open-site protection strategy utilizes administrative controls to address applicable requirements while supporting the Laboratory's mission.

- Incidents of Security Concern are identified and processed according to the Laboratory's Event Reporting Program.
- The Laboratory's Integrated Safeguards and Security Management System (ISSMS) continues to document effective and efficient processes.
- All corrective actions associated with incidents of security concern are tracked on the Ames Laboratory Corrective Action Tracking System (ALCATS) and are completed in a timely fashion.
- The Laboratory's Material Control and Accountability (MC&A) program continues to provide current and accurate accountability and control of materials.
- Ames Laboratory has instructed all Ames Laboratory or ISU employees on Ames Laboratory funding to complete an annual training on privacy and data protection policies.

8.4 Provide an Efficient and Effective System for the protection of Classified and Sensitive Information.

The Laboratory does not possess classified information but maintains protection strategies appropriate for sensitive information. The Counterintelligence (CI) program is mature and the interactions with the CH-CI Officer ensure continuous process improvements.

- The Laboratory reviewed host assignments in order to provide better support to the CIO during interviews. Formerly only US citizens could host foreign nationals, but now DOE policy allows foreign nationals to host visitors and therefore foreign national supervisors can host their own staff which provides a better understanding by the host of the visitor's activities.
- Additional 2010 efforts focused improving trip reports, as a high level of scrutiny is placed on these reports and the Laboratory recognizes their importance. The COO has worked with PDs to help promote better reporting and developed additional guidance on completing the reports.
- The CH-CI Officer assigned to Ames Laboratory has become fully familiar with the Laboratory's employees and programs.
- The Laboratory maintains a sensitive technologies list with designation of research activities involving proprietary information, sensitive research, or a technology listed on the DOE Sensitive Subjects List.
- Annual CI training and program information was provided to employees to ensure that staff are aware of their CI reporting responsibilities.
- In FY2010, there were no reports of contact requesting sensitive information.
- When applicable, information regarding foreign contacts of a personal nature is forwarded on to the Ames Counterintelligence Officer in Chicago.
- Unsolicited emails and documents are forwarded to CH-CI in a timely manner.

Notable Outcomes:

8A: Ames Laboratory will work with the Ames Site Office to benchmark and prepare a draft COOP plan that meets the requirements of DOE O 151.1C, by the end of FY2010. (Obj. 8.1)

The Ames Laboratory's efforts toward development of an effective and efficient continuity of operation program (COOP) are progressing well.

- With assistance of the Ames Site Office, the Ames Laboratory reviewed COOP documentation from Fermi, Princeton, Thomas Jefferson, and SLAC.
- Additional benchmarking and assistance was obtained through DOE-SC staff regarding DOE's COOP activities.
- A draft Continuity of Operation Plan (COOP) was prepared by the Laboratory and reviewed by the AMSO.
- Changes to the COOP will be finalized, and an approved document will be available by the end of FY2010.
- A recent flood event in Ames, Iowa provided valuable experiences with providing continuity of operations.

8B: The Ames Laboratory will identify sensitive data and apply controls as defined in the sensitive enclave policy for Cyber Security. (Obj. 8.2)

Ames Laboratory completed efforts to identify sensitive data and apply appropriate controls, based on established sensitive enclave controls prior to the June 2010 ST&E review. The ST&E review presented a modification to how moderate enclaves are viewed, and now appropriate corrective action has been identified through a Planning Of Action and Milestones (POA&M).

- The 2010 sensitive data inventory contains three business systems. Annual Personally Identifiable Information (PII) Training was prepared and required employees completed mandatory training. Sensitive data discussion with Laboratory staff occurs during the annual cyber walkthrough.
- Laboratory Staff use the central terminal server to access client-server administrative applications reducing the number of connections to business sensitive data. Firewall and OpenVPN controls are implemented to restrict access to business sensitive data.
- There is one research project identified as sensitive. A review of the research sensitive projects occurs annually with the Associate Laboratory Director (Export Control Manager) and Program Directors during the walkthrough.
- The Associate Laboratory Director reviews and approves Public Affairs news releases prior to publications to make sure intellectual property is not disclosed prematurely.

8C: Authority To Operate (ATO) will be renewed by the end of FY2010. (Obj. 8.2)

The Ames Laboratory has been recommended for an extension of the Authority To Operate (ATO) through 2013.

- Ames Laboratory passed the system review held in June 2010 with the Ames Site Office (AMSO) staff. Six corrective actions were identified (3 fail, 3 pass with corrections).
- All corrective actions were added to the Planning Of Action and Milestones (POA&M). Five of the six corrective actions are complete. The remaining corrective action requires substantial effort. An action plan was developed by September 30, 2010 and submitted to the AMSO for approval. The plan addresses modifications to the security categorization and inventory of components in the moderate enclave.
- The Ames Laboratory was recommended for renewal of Authority To Operate (ATO).

Overall Grade 8.0: **B+**