TEXAS A&M UNIVERSITY ASSESSMENT CENTER
FINAL REPORT

Executive Summary

This project benefited the public by assisting manufacturing plants in the United States to save costly energy resources and become more profitable. Energy equivalent to over 75,000 barrels of oil was conserved. The Texas A&M University Industrial Assessment Center (IAC) visited 96 manufacturing plants and spent 101 days in those plants during the contract period from August 9, 2002, through November 30, 2006. Recommended annual energy savings for manufacturers were 37,400,000 kWh (127,600 MMBtu—site basis) of electricity and 309,000 MCF (309,000 MMBtu) of natural gas. Each manufacturer subsequently was surveyed, and based on these surveys reportedly implemented 79% of the electricity savings and 36% of the natural gas savings for an overall energy savings of 48% of recommended. Almost 800 (798) projects were recommended to manufacturers, and they accomplished two-thirds of the projects. Cost savings recommended were $12.3 million and implemented savings were $5.7 million or 47%. During the contract period our average time between site visit and report submittal averaged 46 days; and decreased from 48 days in 2003 to 44 days in 2006. Serving clients well and promptly has been a priority. We visited five ESA overflow clients during FY 06. The Texas A&M University IAC pioneered the presentation of air pollution information in reports, and includes NO_x and CO_2 reductions due to energy savings in all reports. We also experimented with formal PowerPoint BestPractices presentations called Lunchtime/Showtime in each plant and with delivering electronic versions of the report. During the period of the contract, the director served on the Texas Industries of the Future (IOF) Refining and Chemicals Committee, which oversaw the showcases in 2003 and 2006. The assistant director was the Executive Director of the International Energy Technology Conference held annually. The director and assistant director became qualified specialists in the Process Heating Assessment Scoping Tool and the Steam System Scoping Tool, respectively. Research was performed relating to energy conservation and IAC needs, resulting in a paper presented at the ACEEE meeting in 2005, and an internet software tool through the Texas IOF office.

Task Summary:

TASK 1: Conduct Industrial Assessments, to include a variety of plant types and sizes and well as coverage of the geographic area defined in the Annual Workplan.

Table 1 below summarizes the 96 manufacturers visited by the Texas A&M University IAC during the contract period, showing the report number as filed in the national database, the number of days spent at the plant, the plant name, the date of the assessment visit, the location, the product SIC code, and the number of ARs recommended in the final report. There was an average of 8.3 ARs recommended per plant and 5.3 on average were accomplished based on follow-up surveys.

Table 1. Manufacturers visited during contract period

Report	Days	Plant Name	Date	City	SIC	No. of ARs
03-424	1	Southern Clay Products Inc.	September 6, 2002	Gonzales	3295	8
03-425	1	Precision Tube Technology Inc.	September 13, 2002	Houston	3317	8
03-426	1	CFAN Company	September 20, 2002	San Marcos	3724	5
03-427	1	High Tech Finishing	September 27, 2002	Houston	3471	7
03-428	1	Chemical Lime Company	October 4, 2002	Clifton	3274	3

03-429	1	Stone Container Corporation	October 11, 2002	Temple	2653	5
03-430	1	Martin Decker -TOTCO	October 25, 2002	Cedar Park	3823	10
03-431	1	Biocrest	November 1, 2002	Cedar Creek	2836	11
03-432	1	International Group Inc. - IGI Baychem	November 8, 2002	Baytown	2891	10
03-433	1	BPX Films	January 9-10, 2003	Houston	3081	7
03-434	1	Mount Vernon Mills	January 9-10, 2003	Brenham	2299	10
03-435	1	American Spring Wire Corp.	January 17, 2003	Houston	3496	6
03-436	1	Merchant Metals Inc.	January 24, 2003	Houston	3499	10
03-437	1	Cardinal Health	January 31, 2003	Jacksonville	3841	9
03-438	1	Personix	February 7, 2003	Stafford	3089	5
03-439	1	MichaelAngelos Gourmet Foods	February 14, 2003	Austin	2099	12
03-440	1	Bettis Corp./Emerson Process Mgmt.	February 21, 2003	Waller	3593	7
03-441	1	Boring Specialties	February 28, 2003	Houston	3599	11
03-442	1	JM Clipper	March 28, 2003	Nacogdoches	3053	10
03-443	1	Merrick Engineering Inc.	May 30, 2003	Waco	3496	8
03-444	1	Landscaper's Pride	June 6, 2003	New Waverly	2499	6
03-445	1	Materials Transportation Company	June 20, 2003	Temple	3556	7
03-446	1	Marathon Power Technologies Company	July 11, 2003	Waco	3691	9
03-447	1	Kemlon Products & Development Company	July 25, 2003	Pearland	3643	6
03-448	2	Gulfco	August 28-29, 2003	Beaumont	3325	10
04-449	1	International Paint - Akzo Nobel	September 5, 2003	Houston	2851	6
04-450	1	Permocast	September 12, 2003	Temple	3365	8
04-451	1	Curlee Manufacturing - EGS	September 19, 2003	Houston	3644	8
04-452	1	Leggett & Platt	September 26, 2003	Mexia	2393	9
04-453	1	El Lago Tortillas	October 10, 2003	Austin	2099	8
04-454	1	RTI Fabrication	October 17, 2003	Houston	3356	5
04-455	1	Alamo Group Inc.	October 24, 2003	Seguin	3523	7
04-456	1	Monterey Mushrooms	October 31, 2003	Madisonville	2033	8
04-457	1	Southern Steel	November 7, 2003	San Antonio	3442	8
04-458	1	Coastal Foods	January 14, 2004	Houston	2053	9
04-459	1	Cybershield of Texas, Inc.	January 14, 2004	Lufkin	3471	9
04-460	1	Fleetwood Homes of Texas	January 16, 2004	Belton	2451	7
04-461	1	VAM-PTS	January 16, 2004	Houston	3498	13
04-462	1	Rigid Buildings	January 23, 2004	Houston	3448	10
04-463	1	Nutra-Max First Aid Products Inc.	January 30, 2004	Houston	3842	8
04-464	1	R&M Energy Services Inc.	February 6, 2004	Willis	3533	9
04-465	1	Cameron	February 13, 2004	Liberty	3533	10
04-466	1	O&M Manufacturing	February 20, 2004	Houston	3443	8
04-467	1	United Plastics Group	February 27, 2004	Houston	3089	10
04-468	1	T3 Preferred Industries	March 5, 2004	Cypress	3491	7
04-469	1	Alenco	March 26, 2004	Bryan	3442	7
04-470	2	San Antonio Express News	May 27-28, 2004	San Antonio	2711	16
04-471	1	Tysons Foods	June 11, 2004	Gonzales	2048	7
04-472	1	Acco Feeds	June 18, 2004	Seguin	2048	6
04-473	1	Medical Plastics Lab	July 9, 2004	Gatesville	3841	8
04-474	1	Bollinger Texas City LP	July 23, 2004	Texas City	3732	5
04-475	2	Bayshore Industrial	August 26-27, 2004	LaPorte	2821	12
05-476	1	Bollinger Houston LP	September 3, 2004	Houston	3732	6

05-477	1	Alenco Extrusions	September 10, 2004	Bryan	3354	6
05-478	1	T3 Preferred Industries	September 17, 2004	Houston	3491	8
05-479	1	Piping Technology & Products	September 24, 2004	Houston	3531	12
05-480	1	Groth Corporation	October 1, 2004	Stafford	3491	6
05-481	1	PBV-USA, Inc.	October 8, 2004	Stafford	3491	7
05-482	1	Temple Bottling Co.	October 15, 2004	Temple	2086	7
05-483	1	Microwave Networks	October 22, 2004	Stafford	3663	10
05-484	1	Forge USA	October 29, 2004	Houston	3462	7
05-485	1	Allied Tube & Conduit	November 5, 2004	Houston	3315	9
05-486	1	Refrigeration Valves and Systems	January 14, 2005	Bryan	3585	7
05-487	1	Gulf States Paper Company	January 14, 2005	Waco	2657	8
05-488	1	TurboFab	January 21, 2005	Houston	3499	11
05-489	1	Industrial Mechanical Co.	January 28, 2005	San Antonio	3312	5
05-490	1	New Braunfels General Store (NBGS)	February 4, 2005	New Braunfels	3949	10
05-491	1	Constar Plastics	February 11, 2005	Houston	3085	4
05-492	1	Burrows Manufacturing	February 18, 2005	Hutto	2431	8
05-493	1	CRP Balmoral International	February 25, 2005	Houston	3535	11
05-494	1	Custom Rubber Products Inc.	March 4, 2005	Houston	3069	12
05-495	1	Lincoln Lumber Co. Inc.	June 2, 2005	Conroe	2421	9
05-496	1	Hempel Coatings USA Inc.	June 16, 2005	Conroe	3479	6
05-497	1	Houston Chronicle	July 7, 2005	Houston	2711	12
05-498	1	Beaumont Enterprise	July 28, 2005	Beaumont	2711	9
05-499	2	Ball Corporation Metal Beverage Container Group	August 25-26, 2005	Conroe	3411	10
06-500	1	Hayes Industries	September 2, 2005	Sugarland	3496	10
06-501	1	Temple Inland Paperboard & Packaging	September 9, 2005	San Antonio	2653	6
06-502	1	Houston Chronicle	September 16, 2005	Houston	2711	14
06-503	1	S&S Technologies	September 30, 2005	Houston	3844	7
06-504	1	Parkview Metal Products Inc.	October 14, 2005	San Marcos	3469	7
06-505	1	R&M Energy Services Inc.	October 21, 2005	Tomball	3494	8
06-506	1	Texas Systems & Controls Inc	October 28, 2005	Tomball	3443	7
06-507	2	L&H Packing Company	January 12-13, 2006	San Antonio	2011	12
06-508	1	Land O'Pines Dairy Products	January 20, 2006	Lufkin	2086	8
06-509	1	Van Tran Industries	January 27, 2006	Waco	3612	5
06-510	1	Butler Manufacturing	February 3, 2006	San Marcos	3448	11
06-511	1	John Soules Foods Inc.	February 10, 2006	Tyler	2099	6
06-512	1	Sulzer Pumps	February 17, 2006	Brookshire	3561	10
06-513	1	Tysons Foods	February 24, 2006	Seguin	2015	10
06-514	1	Texas Instruments	March 3, 2006	Stafford	3674	6
06-515	1	Freescale Semiconductor	March 24, 2006	Austin	3674	11
06-516	1	Weatherford Engineered Chemicals	June 2, 2006	Elmendorf	2819	6
06-517	1	Texas Tile LLC	June 9, 2006	Houston	3996	10
06-518	1	San Antonio Express News	July 7, 2006	San Antonio	2711	6
06-519	1	Wells Cargo Inc.	July 21, 2006	Waco	3799	10
Total	101					798

Table 2 shows the number of plants visited in the various SIC categories during this contract period. Note that almost one-quarter of the plants visited by the Texas A&M University IAC are in SIC 34, the fabricated metal industry. This fits well with our service to metal fabrication shops (many in Houston, see Table 1) that are in turn serving the very large chemical plants and refineries on the Gulf Coast. We note that Texas uses almost one-fifth of the industrial energy used in the US and most of that is consumed on the Texas Gulf Coast.

Table 2. Types of manufacturing plants served by SIC classifications.

SIC	Description	No. of Plants
20	Food and kindred products	11
22	Textile mill products	1
23	Apparel and other finished fabric products	1
24	Lumber and wood products, except furniture	4
26	Paper and allied products	3
27	Printing, publishing and allied industries	5
28	Chemicals and allied products	4
29	Petroleum refining and related industries	1
30	Rubber and miscellaneous plastics products	6
32	Stone, clay, glass and concrete products	2
33	Primary metal industries	7
34	Fabricated metal products, except machinery and transportation equipment	23
35	Industrial and commercial machinery and computer equipment	10
36	Electronic and other electrical equipment and components, except computer equipment	7
37	Transportation equipment	4
38	Measuring, analyzing, controlling instruments; photographic, medical, optical goods; watches	5
39	Miscellaneous manufacturing	2
Total		96

TASK 2: Promote and increase the adoption of assessment recommendations.

The Texas A&M University IAC developed a plan specifically to guide follow up for two classes of ARs: those with savings of over $250,000 per year and those with savings in the range $100,000 to $250,000 per year. Attachment 1 includes guidelines followed in seeking to increase the adoption of these large ARS.

Mr. Jim Eggebrecht, Assistant Director, handled this task primarily. In the first quarter of the project, he identified eight projects with savings of about $250,000 per year from FY 02 and FY 03. Calls were made to plants 420 and 423—two multi-day assessments with large recommended savings. For plant 420 there was one large AR to replace natural gas-fired engines that plant personnel reported would be implemented starting in October 2004. Personnel for plant 423 report that all projects with savings of $250,000/year or greater, save one, had already been or were planned. One AR was not planned for implementation primarily due to lack of capital.

In following up on large ARs, one AR of just over $100,000 for steam trap repair in report 0442 was discussed with the plant and was implemented.

The TAMU IAC recommended installing two, 250 kW microturbines in report 0448. The AR was unusual because it had a one-time savings of $1.2 million by avoiding a charge for a utility installation.

Annual savings are $31,100. During the two-day assessment visit to this plant, we discussed this electrical supply issue at length with plant personnel, suggesting that our recommendation might provide leverage in discussions with the utility to reduce the $1.2 million cost of a new substation. This AR eventually did have a positive impact on plant-utility negotiations to reduce the cost of electrical supply. The company used our evaluation very profitably in negotiating a much better arrangement with the power company and did not need to install the microturbines.

The TAMU IAC recommended installing a powder paint line for $934,000 in report 0469. As a part of our analysis, we also considered waste heat recovery from the existing liquid-spray, electrostatic paint line. We did followup work with the plant described in report 0469 with regard to water, wastewater, and the powder paint line. We were able to determine after some work that there were no large savings to be obtained in the water and wastewater areas. We also attempted a CHP analysis but abandoned it when we determined the plant would not implement it.

For assessment 482, plant personnel contacted us for more information about AR #1 with savings of $50,000/yr. They were referred to an expert in this area, Dr. Roy Hann of the Environmental & Water Resources Engineering group of the Civil Engineering Department, who contacted the plant.

Plant personnel for visit 483 contacted us about AR #2 (savings of $23,715/yr) dealing with substitution of nitrogen for compressed air. A conference call between our assistant director, the plant contact and the plant's nitrogen supplier discussed the benefits of the recommendation.

When the followup call was made for report 0517 we learned of an additional savings not captured in one large AR. When the heaters were replaced for AR #1 our expected savings were $113,000/year for the avoided cost of natural gas saved. It was also discovered by the plant that this greatly reduced the wear and tear on the conveyor belts, resulting in additional estimated savings of about $100,000/year.

A short power point presentation called "Lunchtime/Showtime" was developed about the IAC and Best Practices. We asked plant management personnel, including some who do not normally get involved in an assessment, to join us for lunch during an assessment day visit for this brief, but formal presentation. We tested this early in the contract period. Presentations in plants of the 10-minute "Lunchtime/Showtime" power point show to promote ITP's BestPractices program and hopefully to increase adoption and implementation of projects were made. Plant 0497 seemed interested in the use of Motormaster, and possibly some of the other software covered in the presentation. Printouts of the presentation were provided to them so they could have information on the websites to access the software. Plant personnel were never very receptive to making use of the information in "Lunchtime/Showtime" and eventually we abandoned the presentations.

In following up for visit 487, which had one AR that saved $108,000 per year, we determined the plant had been closed or sold and the equipment moved to another location.

During FY 06, we established a goal to contact all plants 7 to 10 days after they receive the report to encourage AR adoption. We contacted all our 06 visits after the report arrived.

Contacted Hayes Industries in January (our contact did not return calls during the last quarter of 2005, so eventually we contacted an owner who had been our initial contact), particularly to answer questions and offer assistance pertaining to two large ARs involving automation. They were interested in obtaining testing and design help for product improvement, but not process improvement. We were able to locate someone in our Civil Engineering Department to whom they may turn for advice.

The last three visits in Table 3 came to us through the SEN program as ESA overflow clients. For 514, we recommended that they burn a waste stream in their thermal oxidizer to both save energy costs and disposal costs. They felt this would be an air quality issue, but considered marketing the waste stream as raw material. For 515, we recommended CHP which the local municipally owned utility also favors. However, the utility's subsidy funds are drying up, and thus now it appears infeasible. Two or three years ago, it would have been successful. We also recommended thermal energy storage at this plant and it is now on the organization's long-term consideration list at this plant and at a sister plant, but not in the budgeting process as yet.

Table 3. Selected 12-month follow-up efforts

Client name/audit number	Initial visit date	Follow-up date	Additional metrics reported to Field Manager
Houston Chronicle/06-0502	9/16/05	3/29/06	Project in '07 or '08 budget
Texas Instruments/06-514	3/3/06	5/06 & 9/12/06	
Freescale/06-0515	3/24/06	6/06 & 9/12/06	
Texas Tile/06-0517	6/9/06	8/31 & 9/12 (no response)	

TASK 3: Promote the IAC Program and enhance recruitment efforts for new clients and expanded geographic coverage.

About 1700 potential assessment sites were contacted by telephone to describe the program and offer services. The program was promoted by distributing IAC brochures at the International Conference for Enhanced Building Operations Oct 14-17, 2002, in Richardson, Texas. The program was advertised to a training class sponsored by the Association of Energy Engineers for certified energy managers held in Dallas in early October of 2003.

The IAC was publicized at an electric power company seminar on December 3, 2002, and a contact was made at that meeting that lead to an assessment in Madisonville, TX for report 456.

The IAC had a booth at the Texas Technology Showcase 2003 in Houston, held March 17-19, 2003. One student prepared the materials to be hung on the booth backdrop, and a scrolling power point presentation was displayed on a laptop at the booth. The IAC director was a session chair for one session and made a presentation in another session for small plants entitled, "Self-help Energy Analysis for Your Plant."

The IAC was publicized by James Eggebrecht at the Industrial Energy Technology Conference (IETC) during his opening statements at the Energy Managers' Workshop on May 13, 2003. A booth advertising the IAC was set up in the registration area at the IETC.

During 2004 we updated the TAMU IAC website to include more information about USDOE and Rutgers, to show our service area and training information, and to provide a mission statement.

In spring, 2005, we made about 50 calls and emails to candidates of the SEN program that were referred to us because they were not selected for the ESA of the SEN program. One plant contacted by us has a sister plant in the Pittsburgh area, and they were told about the WVU IAC in an email.

Contact has been made with all six of the ESA program supplied eligible clients, resulting in two IAC visits in March, 2005, two ESA plants in June, and one in July. The remaining ESA plant contact did not result in a visit; it has been contacted but did not supply utility bills and other information.

TASK 4: Provide educational opportunities, training, and other related activities for IAC students.

All new students receive safety training and program training covering both DOE support and local procedures before they participate in any official IAC duties. During the period of this contract, about 34 students received training. All students receive further on the job training, and feedback is provided to students about their assessment recommendation performance.

We scheduled weekly meetings that continue for about 10 or 12 weeks each semester. The purpose of the meetings is team-building, problem solving, and familiarization with any assessment visits scheduled that particular week.

On February 16 and 23, 2004 we scheduled additional training meetings at noon to learn about electrical rate issues with presentations by Ms. Susan Linenschmidt, a deregulation expert from Texas A&M University's Energy Systems Laboratory.

Texas A&M University has sent students to all lead student meetings since the program began, and

the lead students always report back to the other students in a meeting.

Three IAC students attended the Texas Technology Showcase 2003 March 17-19 in Houston. They operated our booth, and attended speeches and presentations.

Student Zachary Rosenbaum attended the 5th Combined Heat and Power Roadmap Workshop held in Austin, Texas in 2004 in conjunction with the WEEC of the AEE.

IAC Assistant Director, Jim Eggebrecht, is Executive Director for the IETC, and IAC students often participate in this conference.

Four students from the University of Louisiana—Layayette IAC were session aides at the International Energy Technology Conference (IETC) held in New Orleans May 11-12, 2005 and in May 10-11, 2006. Ted Kozman, Director of the Louisiana IAC, also attended. Other IAC students attended the conference.

Joseph Freeman, Lead Student at the Texas A&M University IAC attended the IETC in 2005 and Prahlad Kalidas attended the Institute of Industrial Engineers annual meeting, May 14-16, 2005 in Atlanta, Georgia.

Andy Hanegan and David Huitink, both mechanical engineering students, attended the 2005 ACEEE summer study in West Point, New York.

In 2006 we participated in the Northwest Food Processors' Association web cast, which was arranged and coordinated by our lead student at the time, Luke Hargrove.

TASK 5: Coordinate and integrate Center activities with other Center and IAC Program activities, DOE's Industrial Technologies programs and others.

We supported the Texas Technology Showcase 2003 scheduled for March 17-19 in Houston. We were a sponsor and had a booth. Our booth and a scrolling computer presentation highlighted DOE sponsorship and CAES involvement in the IAC program, as well as the Texas A&M University IAC activities and student involvement. The backdrop had a map (provided by CAES) showing all the IACs; contact information for the IAC's at Texas A&M University , UT Arlington and University of Louisiana; and pictures of students collecting data at some recent assessments.

We provided an assessment at the end of August, 2002, for a Houston refinery that was a showcase participant. In September and October we spent unusual effort preparing the 129-page report and during November we prepared a revision. The report has 14 recommendations detailing $2.8 million annually in savings.

The director attended a meeting in Houston on September 10, 2002, to assess the Scoping Tool to Analyze NO_x Reductions prepared by Arvind Thekdi for US DOE.

Texas A&M University pioneered the presentation of air pollution information in reports. We included CO2 and NOx reductions in all our reports. This is a great service to manufacturers in the Houston-Galveston NOx air quality non-attainment zone who are facing mandatory and expensive reductions. It also educates other manufacturers outside the zone and students to the pollution impact of energy decisions.

Late in May, 2003, Mr. Gary Faagau, Director of Operations Practices of Valero Energy Corporation, a refiner that was a key sponsor for the showcase called about an unfilled internship position and subsequently they hired Cheryl Keel, a junior chemical engineering major needing an internship and who had worked for the IAC for a year.

We participated in planning follow-up for the Texas Technology Showcase 2003.

In September 2003, under the leadership of Ted Kozman, the IAC director at the University of Louisiana at Lafayette, we participated with the Texas IOF/University of Texas in seeking a Hydrogen Technology Learning Center. In this proposal, we joined with the IAC director at the University of Louisiana at Lafayette and with the University of Texas to propose the establishment of Hydrogen Technology Learning Centers to hold workshops about the hydrogen economy for industry, universities and high schools.

The director was a member of the Texas IOF Chemicals and Refining Advisory Committee during this contract period. A strategic plan extending through 2006 was completed and submitted by the Texas IOF program headed by Kathey Ferland to DOE. The director participated in several teleconferences, and in planning for Texas Technology Showcase 2006, and supplied several letters of support.

The assistant director also spoke for 15 minutes about the TAMU IAC, and the DOE IAC program in general, at the start of the Energy Managers' Workshop held on April 20, 2004, in conjunction with the IETC. The Lunchtime/Showtime was presented.

The director attended the 5th Annual CHP Roadmapping Conference in Austin in September, 2004.

The assistant director attended Qualified Steam Specialist training and successfully became a Qualified Specialist on July 15, 2004.

Christopher Russell, Senior Program Manager of the Alliance to Save Energy in Washington DC wished to test a software program being developed for the Alliance with a company of the type IACs visit, and chose Texas A&M University as a test site. The Alliance was chosen by DOE to develop a protocol for replicating IAC assessments for clients with multiple plants. During the period April-July, we coordinated with him to arrange for him to accompany us on a visit, and to test the software program in an actual plant environment. That test was successfully completed on July 9, 2004, in Gatesville, Texas, with both the director and assistant director participating in the assessment visit.

In another software test, the Texas A&M University IAC volunteered to participate in beta tests of the Plant Energy Profiler, being developed by Veritech under contract to ORNL with participation by AICHE to identify energy savings opportunities in plants. The director familiarized himself with the beta-version of the software, and participated with a Texas plant in a test in Point Comfort, Texas, in September, 2004.

In February, 2005, we supplied a copy of the training manual used to prepare other universities to compete for an IAC to Mr. James Hemsath of the Artic Energy Office of DOE.

Growing out of the director's membership on the Texas IOF Chemicals and Refining Advisory Committee was a summer 2005 project funded by the Texas Council on Environmental Quality (TCEQ) to provide a self-assessment manual for small Texas manufacturers. The project involved using the national IAC database maintained by Rutgers to identify good projects, and then using two documents developed by the Center for Applied Energy Studies at Rutgers as a springboard for developing spreadsheet calculations to do the assessment calculations for 16 projects. Four IAC personnel were involved in this activity, and though they were funded by TCEQ funds, they drew heavily on their IAC background to accomplish this project. The involved employees were the director, assistant director, and two students, Randy Kelley and David Huitink.

Every month when the E-Bulletin was received from DOE it was forwarded, along with some introductory comments about the E-Bulletin by the assistant director, to our past list of clients served. The clients on this list have also been informed at various times of the progress of the SEN program.

The director attended the IAC summit meeting in Washington DC April 25-26, 2006, and provided information for the Texas Engineering Experiment Station's Legislative Liaison officer to use in supporting the IAC program.

During this period, the director co-taught an Association of Energy Engineers seminar course on the Fundamentals of Energy Management about 15 times, and used many examples from IAC experience, as well as describing the IAC briefly to approximately 30 attendees at each course. One of the courses eventually resulted in an assessment visit 499 for the Texas A&M University IAC.

TASK 6: Other tasks or special projects, as needed, and as determined by DOE to be advantageous to the program and in furtherance of IAC Program goals.

Mr. Buddy Garland and Dr. Mike Muller participated in an assessment with the Texas A&M University IAC on September 13, 2002, in Houston.

On October 29, 2002, the director attended a workshop on Distributed Resource Generation in Texas. This workshop was funded by US DOE's Denver Regional Office.

We collected alumni addresses from university records, coordinated efforts with Ms. Michaela Martin, ORNL, and in November, 2002, mailed about 150 letters providing the website for the alumni survey and asking alumni to please complete it. We also provided digital photographs from an IAC plant visit to Ms. Martin. These alumni represent student employees who were here as early as 1986, when the IAC at Texas A&M University started. A main point of the letters was to ask the alumni to complete an online survey for DOE about the influence of the IAC program on their careers. The results of our letter-sending attempts:

Attempted to find: 177 addresses
Found and sent letters: 148 addresses (84%)
Returned by USPS, addressees unknown: 26 (18% of sent letters)
Number who completed online survey: 14 (9% of sent letters)

In April, 2003, our contract was modified to include a special project to develop and provide special training for potential IACs. We completed the training materials and on August 18-20, 2003, delivered the first training session for the Atlanta Regional Office to 14 attendees from four universities, the Kentucky Pollution Prevention Center, the South Carolina Manufacturing Extension Program, and the Kentucky Div. of Energy. Eventually, we improved the material and provided training in all the DOE regions. Training was held in Omaha, Nebraska in January, 2004; Boise, Idaho, July, 2005; College Park, Maryland, August, 2005; Brookhaven, New York, August, 2005; and Chicago, Illinois, September, 2005. The total number trained was 89. The training in Boise, Idaho, was in conjunction with an actual IAC assessment performed by the Intermountain IAC at the University of Utah, and was a unique cooperative effort between the personnel from the Texas A&M University IAC and the University of Utah IAC.

Cheryl Keel, a Texas A&M University chemical engineering undergraduate student, has developed a new web-based report format involving use of disks as the transmittal media with internal linking in the report. We delivered it to the manufacturers using disks rather than the web because of privacy and web-security issues. The first report to be delivered on a trial basis was for visit 466.

We delivered two reports using this method, but manufacturers seem to be just as pleased with the traditional paper copies.

The director participated on October 12, 2004, with Dr. Alexander Zhivov of the Army Corps of Engineers Civil Engineering Research Laboratory in a meeting and walk-through of the Corpus Christi Army Depot's industrial facility about conducting a FEMP assessment.

The director corresponded with Field Manager about the possibility of involving a large corporation with many facilities larger than IAC limits in a replication study funded independently of the IAC program. Also, this IAC was involved in providing support for a replication study initiated by Dr. Kozman of the Louisiana IAC, and performed assessments of two barge-refurbishment facilities.

The director spoke in May, 2005, on engineering ethics at a forum held by the North Texas Association of Energy Engineers (NTAEE), which serves the Dallas Ft. Worth area. He used that opportunity to thank the NTAEE for their scholarship support of Texas A&M University IAC students, who have received very good scholarship support from both the NTAEE and the Lone Star Association of Engineers in the Houston area.

We provided a letter of support for the Gulf Coast CHP Regional Application Center in its effort to obtain a contract, and participated in its Roadmap Workshop on April 26-27, 2005.

The director and two students, Andy Phelan and Kaleena Ebert, have been involved with Plant Energy Profiler, and participated in a conference call 10/18/05 to discuss experiences with PEP. One

student had been involved testing it with the food industry and one with metal casting.

The assistant director, who is a Qualified Specialist in steam, successfully responded to the call for proposals to perform Energy Savings Assessments for large plants in 2006 and 2007.

The director attended the PHAST qualified specialist training in Downey, California, October 25-27, 2005, and became a PHAST Qualified Specialist.

The director was one of about 18 persons asked to review the beta version of the SEN CD for DOE in January, 2006, and he supplied comments within the deadline.

The assistant director, a Qualified Steam Specialist, conducted a SEN assessment of the Imperial Sugar plant in Gramercy, Louisiana, and the Freescale Conductors plant in Austin, Texas on March 21-23, 2006. Another SEN assessment for Sterling Chemicals in Texas City, Texas was on April 4-6, 2006.

The SEN program was featured in the May 2006 Industrial Energy Technology Conference hosted by the TAMU System Energy Systems Laboratory. Two presentations in the pre-conference Energy Managers' Workshop were included as well as a session with five presentations during the technical presentation portion of the conference.

Other Achievements/Overall Status of Program.

Our abstract submitted to the ACEEE Summer Study on Energy Efficiency in Industry entitled, "Benefits of Multi-day Industrial Assessment Center Assessments," was accepted. The draft paper was submitted on time and draft copies were provided to the Program Manager, Ms. Glatt, and the Field Manager, Mr. Muller. The abstract of the draft paper reads as follows:

> Assessment results from two and three-day visits to eight large IOF plants are discussed. The impact on program metrics for one Industrial Assessment Center (IAC) is shown. Emphasis is on the effect on the IAC and its student employees, and on its program metrics. Average program savings per assessment recommendation (AR) rises by 38% from $8,400 to $11,600 with the inclusion of 96 ARs saving an average of $112,000 each at the larger plants. Implemented savings are increased because the fraction implemented rose from 52% for the one-day visits to 57% for the multi-day visits. The average number of ARs in reports increased from 7.5 per plant to 12, a 60% increase, and supports results from an earlier study. Students are exposed to more complex projects and plants, and have more challenging projects, as well as receiving more attention.

The paper "Benefits of Multi-day Industrial Assessment Center Assessments," for the ACEEE Summer Study on Energy Efficiency in Industry was presented in July, 2005.

The director traveled to Centro Federal de Educação Tecnológica de Minas Gerais in Belo Horizonte, Brazil, to teach and consult about energy conservation efforts. The US IAC program was a topic of considerable conversation, and there was interest in beginning such a program. Software tools such as Motormaster, 3Eplus, and BLCC5 were demonstrated. Foreigners have excellent access to US information via the web, and can avail themselves easily of information and freeware.

The Assistant Director, James Eggebrecht, received his P.E. license from Texas, number 94384.

The Houston area is second only to the Chicago area in numbers of potential assessment sites, and the Gulf Coast area of Texas and Louisiana are some of the most industrial energy intensive areas in the world. Texas uses 19% of US industrial energy and Louisiana uses 7%.

The state of the program at Texas A&M University was excellent during this contract period. We had good students and staff, and good university support, especially through the Texas Engineering Experiment Station and its Energy Systems Laboratory. Synergistic activities such as involvement with Texas State IOF, Gulf Coast CHP Regional Application Center, and the Industrial Energy Technology Conference of the Energy Systems Lab are important contributors to the general atmosphere of interest in energy conservation at this university.

ATTACHMENT 1

Followup for Important ARs

ARs with greater than $250,000/yr savings

1. Call one month after report mailed
    a. Seek to answer any questions about what AR recommends, learn what concerns the plant has about the ARs.
    b. Does AR need positive or negative savings revisions?
    c. Does plant need help with researching services/products to implement the ARs?
    d. Would plant find it useful for us to join the loop between the plant and the supplier, to explain the project so both understand what is needed?
    e. Would plant like to know of successful users of the practice recommended in the AR?
    f. Could projects be justified, or have additional justification, from other than their energy savings? Does the AR solve some additional problems or have additional value for management to consider?
    g. Is there a need to revisit the plant to review report/subsequent actions by the plant?
    h. Does the plant need incentive funds?
    i. Does the plant need design help?
2. Answer questions/provide information by follow-up letter within one month of first follow-up call.
3. Call one month after follow-up letter sent to inquire of additional help needed by plant.

Additional points for follow-up contact

1. At first draft of the report in-house, often the first indication of high savings potential of some projects, start looking at the project to become familiar with it.
    a. Talk with student to determine what they are looking at.
    b. Visit with plant to see actions necessary to implement recommendation, confirm data going into the analysis, and determine plant willingness to follow-through with large recommendation.
    c. Begin to develop some of the eventual follow-up information to be expanded upon in later efforts as above.
2. Weave results into the eventual final report as appropriate.
3. Prioritize projects that need this assistance according to ability/manpower of plant and whether the assistance will sway the implementation practice of the plant.

For Projects above $100,000/yr but less than $250,000/yr

1. Do the same above as time allows, except don't offer the design class help.