Petroleum Technology Transfer Council

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Targeted Technology Transfer to US Independents

Submitted by:

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Disclaimer

ABSTRACT

The Petroleum Technology Transfer Council (PTTC) was established by domestic crude oil and natural gas producers, working in conjunction with the Independent Petroleum Association of America (IPAA), the U.S. Department of Energy (DOE) and selected universities, in 1994 as a national not-for-profit organization. Its goal is to transfer Exploration and Production (E&P) technology to the domestic upstream petroleum industry, in particular to the small independent operators. PTTC connects producers, technology providers and innovators, academia, and university/industry/government research and development (R&D) groups. From inception PTTC has received federal funding through DOE's oil and natural gas program managed by the National Energy Technology Laboratory (NETL). With higher funding available in its early years, PTTC was able to deliver well more than 100 workshops per year, drawing 6,000 or more attendees per year. Facing the reality of little or no federal funding in the 2006 – 2007 time frame, PTTC and the American Association of Petroleum Geologists (AAPG) worked together for PTTC to become a subsidiary organization of AAPG. This change brings additional organizational and financial resources to bear for PTTC's benefit. PTTC has now been "powered by AAPG" for two full fiscal years. There is a clear sense that PTTC has stabilized and is strengthening its regional workshop and national technology transfer programs and is becoming more entrepreneurial in exploring technology transfer opportunities beyond its primary DOE contract.

Quantitative accomplishments: PTTC has maintained its unique structure of a national organization working through Regional Lead Organizations (RLOs) to deliver local, affordable workshops. During the contract period PTTC consolidated from 10 to six regions efficiency and alignment with AAPG sections. The number of workshops delivered by its RLOs during the contract period is shown below. Combined attendance over the period was approximately 32,000, 70% of whom were repeat attendees. Participant feedback established that 40% of them said they had applied a technology they learned of through PTTC.

Central/Eastern Gulf	Univ. of Alabama, LSU Center for Energy Studies	77
Eastern	West Virginia University, Illinois Geological Survey, W. Michigan Univ.	99
Midcontinent	University of Kansas, University of Tulsa, Okla. Geological Survey (past)	123
Rocky Mountains	Colorado School of Mines	147
Texas/SE New Mexico	Bureau of Economic Geology, U. of Texas at Austin	85
West Coast	Conservation Committee of California O&G Producers, Univ. So. Cal. (past)	54

At the national level HQ went from an office in Houston to a virtual office in the Tulsa, Okla. area with AAPG providing any physical assets required. There are no employees, rather several full time and several part time contractors. Since inception, PTTC has produced quarterly and mailed the 16-page *Network News* newsletter. It highlights new advances in technology and has a circulation of 19,000. It also produces the *Tech Connections* Column in *The American Oil & Gas Reporter*, with a circulation of 13,000. On an approximate three-week frequency, the electronic *Email Tech Alert* goes out to 9,000 readers. The national staff also maintains a central website with information of national interest and individual sections for each of the six regions. The national organization also provides legal and accounting services, coordinates the RLO activities, exhibits at at least major national and other meetings, supports the volunteer Board as it provides strategic direction, and is working to restore the Producer Advisory Groups to bolster the regional presence.

Qualitative Value: Three qualitative factors confirm PTTC's value to the domestic O&G producing industry. First, AAPG was willing to step in and rescue PTTC, believing it was of significant interest to its domestic membership and of potential value internationally. Second, through a period of turmoil and now with participant fees dramatically increased, industry participants "keep coming back" to workshop activities. Third, technology developers seek out PTTC for exposure for their developing technologies, and many industry organizations/groups seek out PTTC for promotion of their meetings or events. A quantitative impact analysis performed in 2005 also attributed measurable reserves from PTTC's work.

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EXECUTIVE SUMMARY

The Petroleum Technology Transfer Council (PTTC) was established by domestic crude oil and natural gas producers, working in conjunction with the Independent Petroleum Association of America (IPAA), the U.S. Department of Energy (DOE) and selected universities, in 1994 as a national not-for-profit organization. Its goal is to transfer Exploration and Production (E&P) technology to the domestic upstream petroleum industry, in particular to the small independent operators. PTTC connects producers, technology providers and innovators, academia, and university/industry/government research and development (R&D) groups. From inception PTTC has received federal funding through DOE's oil and natural gas program managed by the National Energy Technology Laboratory (NETL). With higher funding available in its early years, PTTC was able to deliver well more than 100 workshops per year, drawing 6,000 or more attendees per year. Facing the reality of little or no federal funding in the 2006 – 2007 time frame, PTTC and the American Association of Petroleum Geologists (AAPG) worked together for PTTC to become a subsidiary organization of AAPG. This change brings additional organizational and financial resources to bear for PTTC's benefit. PTTC has now been "powered by AAPG" for two full fiscal years. There is a clear sense that PTTC has stabilized and is strengthening its regional workshop and national technology transfer programs and is becoming more entrepreneurial in exploring technology transfer opportunities beyond its primary DOE contract.

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1.0 INTRODUCTION

The Petroleum Technology Transfer Council (PTTC) was established by domestic crude oil and natural gas producers, working in conjunction with the Independent Petroleum Association of America (IPAA), the U.S. Department of Energy (DOE) and selected universities, in 1994 as a national not-for-profit organization to transfer Exploration and Production (E&P) technology to the domestic upstream petroleum industry. Coordinated by a national staff, PTTC focuses on delivering local affordable workshops, working through universities/geological surveys in regions that cover producing areas of the U.S. Complementing the workshop program, PTTC maintains a strong web presence, newsletter, and exhibit and communications program.

From inception PTTC has received federal funding through DOE's oil and natural gas program managed by the National Energy Technology Laboratory (NETL). Funding was strong during early years and PTTC was able to deliver well more than 100 workshops per year, drawing 6,000 or more attendees per year. But in FY07 PTTC faced the reality of no further federal funding. During FY07 PTTC negotiated with the American Association of Petroleum Geologists (AAPG) for PTTC to become a subsidiary organization of AAPG and for AAPG to manage PTTC, which would bring organizational and financial resources to bear to provide a longer-term future for PTTC. AAPG and PTTC proceeded forth even though federal funding, albeit at a much lower level, was ultimately obtained. The changeover to an AAPG-managed PTTC occurred at the very end of FY07 and PTTC has now been "powered by AAPG" for two full fiscal years. Operations have stabilized and there is a sense that PTTC is building for the future. PTTC won a competitive solicitation to provide technology transfer services to DOE and is beginning a new five-year contract starting FY10. PTTC has also received an award from DOE to provide, with partners, "CCS Regional Training in the Permian Basin." Efforts to raise significant industry funding have largely been unsuccessful, being hampered significantly by the industry downturn that began in fall 2008. With a recovering industry PTTC anticipates revisiting sponsorship and industry fund raising.

As shown in **Figure 1**, workshop activity had dropped significantly during the uncertain (and poorly funded) times during FY07. PTTC's focus during FY08 was on building the organizational structure and restarting the regional workshop program. The Regional Lead Organizations (RLOs) are universities, geological surveys or other organizations that deliver workshops locally in PTTC's six regions (**Figure 2**), which are coincidentally roughly aligned with AAPG's Sections for synergy. The RLOs adapted to a non-subsidized business model with higher workshop attendee fees. PTTC was successful in raising activity level during FY08 to the planned 70 or so workshops per year with total attendance being just over 3,100. There has been a further modest increase in activity in FY09 with 74 workshops that drew more than 3,600 participants.

Table 1 outlines PTTC's regional history since inception. Initially, there were 10 regions. When financial stress came during FY06, reorganizations occurred for cost control and PTTC emerged with seven regions. Further consolidation to six regions occurred with the start of FY08 when PTTC became powered by AAPG.

Section 2.0 provides further discussion of workshop activity. **Section 3.0** describes the national program. **Section 4.0** discusses the impact of PTTC's technology transfer program. Supporting details are provided in several appendices.

Figure 1 - Historical Workshop Activity and Attendance from Inception

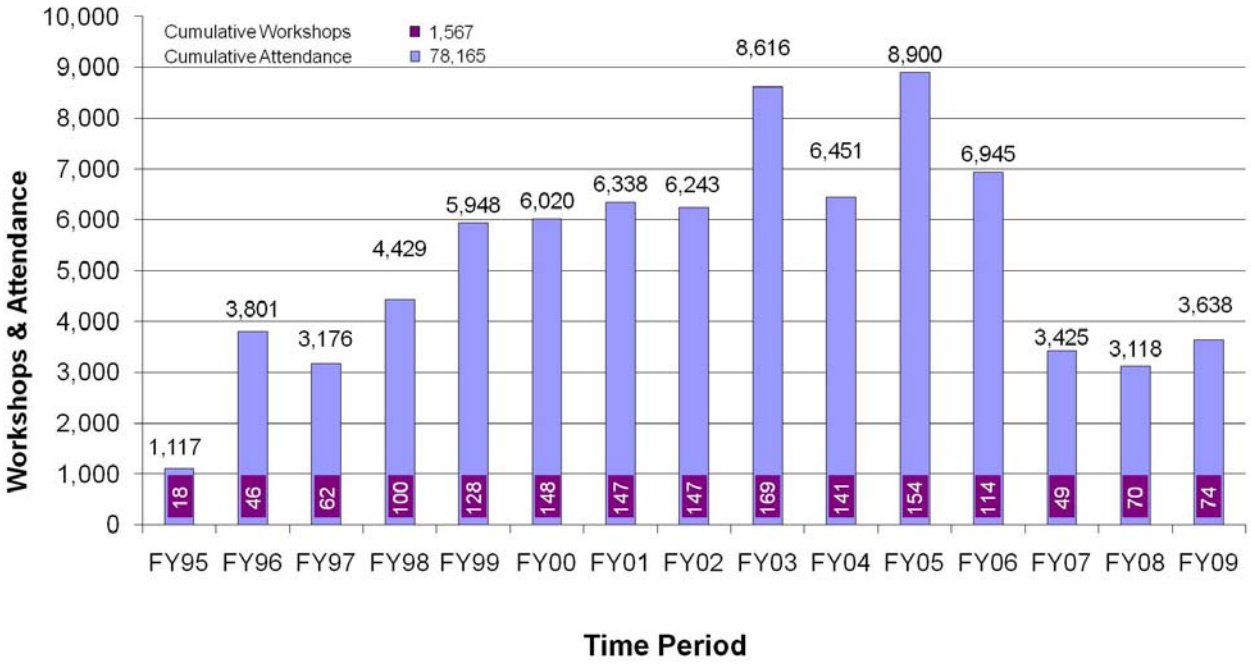


Figure 2 - PTTC Regional Map

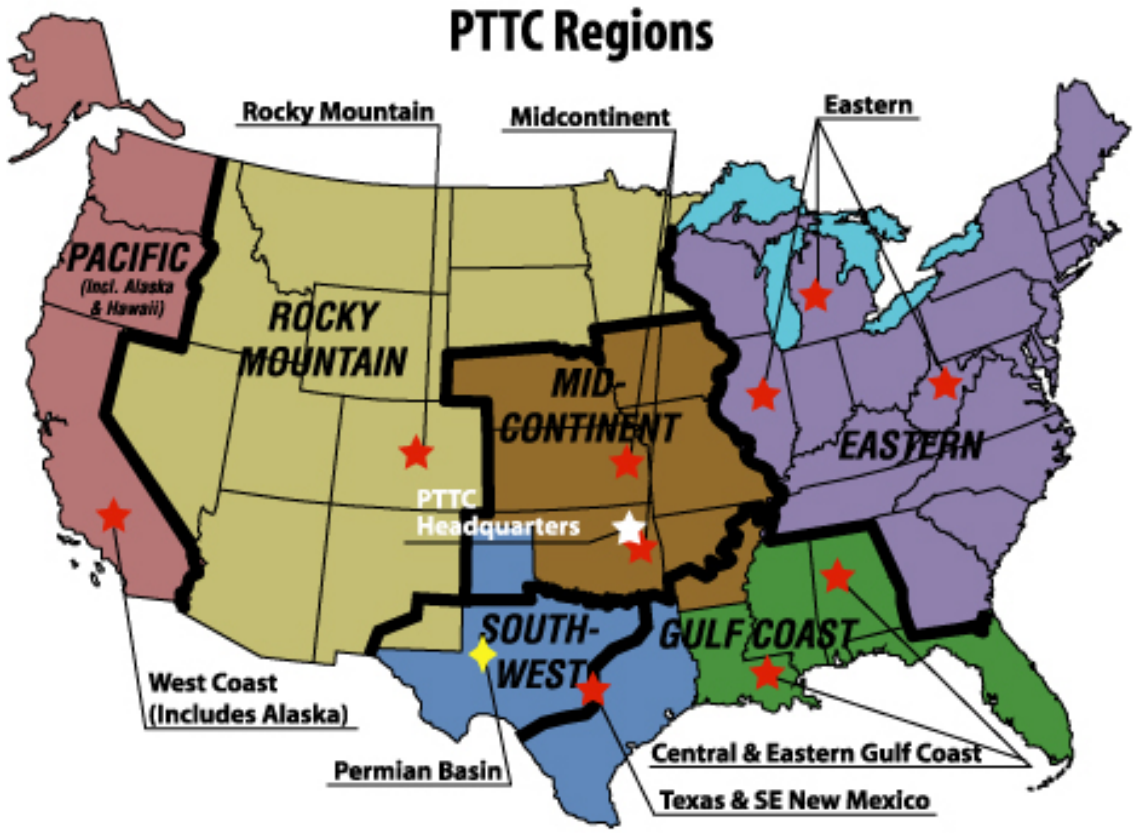


Table 1 - PTTC Regional Structure

Region	Regional Lead Organization (RLOs)	Explanatory Comments
Central/ Eastern Gulf	• University of Alabama • Louisiana State University, Center for Energy Studies	Both RLOs have been part of PTTC since inception. Initially functioning as separate Central Gulf and Eastern Gulf regions, the regions were merged into the Central/Eastern Gulf Region starting FY07 when PTTC was consolidating to reduce costs.
Eastern	• West Virginia University • Illinois State Geological Survey • Western Michigan University	All RLOs have been part of PTTC since inception. Initially functioning as separate Appalachian Region and Midwest Regions, the regions were merged into the Eastern Region starting FY08 for alignment with AAPG sections.
Midcontinent	• University of Kansas, Tertiary Oil Recovery Project • Oklahoma Geological Survey (past) • University of Tulsa, Petroleum Engineering (beginning FY10)	The University of Kansas has been part of PTTC since inception. The Oklahoma Geological Survey served from inception through FY06 when it chose not to participate further. Initially functioning as North Midcontinent and South Midcontinent Regions, the regions were merged into the Midcontinent Region starting FY07 when PTTC was consolidating. There has not been an RLO serving Oklahoma and Arkansas during the FY07 through FY09 time frame. The University of Tulsa will begin serving this area starting FY10.
Rocky Mountain	• Colorado School of Mines	The RLO has been part of PTTC since inception. The region expanded to include northeast New Mexico and some other western states when the Southwest Region was split up starting FY07 when PTTC was consolidating to reduce costs.
Texas/ SE New Mexico	• Bureau of Economic Geology (BEG), Univ. of Texas at Austin • New Mexico Tech (past Southwest Region which was primarily New Mexico)	The BEG has been part of PTTC since inception. The region expanded to include southeast New Mexico when the Southwest Region was split up starting FY07 when PTTC was consolidating to reduce costs.
West Coast	• Conservation Committee of California Oil & Gas Producers (CCCOGP) • University of Southern California	The University of Southern California served as RLO through FY06. Unable to continue under the new financial realities, there was not an RLO during FY07. CCCOGP began serving as RLO starting FY08.

2.0 WORKSHOP ACTIVITY

Regional Lead Organization (RLO) Directors have three primary responsibilities: (1) identify the technology information needs or topics of interest to their regional audience, (2) develop an annual workshop plan to deliver the information and (3) execute the plan and deliver the workshops.

Workshop topics in the exploration and production (E&P) realm are influenced by input from the Producer Advisory Groups (PAGs), feedback from prior workshop attendees, and the RLO Director's personal experience. Focus is satisfying the technology information needs of PTTC's primary audience, which are smaller independent operators. Each fiscal year PTTC's Regional Lead Organizations (RLOs) develop an annual workshop plan outlining workshop topics, locations and tentative dates that would deliver the information desired by industry. These annual plans and associated budgets are reviewed and approved/modified by PTTC's Board. Then the RLOs execute the approved plans.

Regional workshop activity and workshop attendance for the Period FY04 through FY09 were aggregated, then the geographic distribution analyzed (**Figure 3**) according to the current regional structure. With regards to workshop activity, the most active regions were the Rocky Mountain Region, the Midcontinent Region and the Eastern Region. The geographic distribution of attendance (**Figure 4**) roughly paralleled the activity distribution with the above three regions also showing the highest attendance levels. Of the regions, the West Coast Region exhibited overall the lowest activity and attendance.

Regional attendance and activity for the period FY04 through FY09 by event by region for the six regions are listed in **Appendix A**. Results are displayed graphically in **Figure 5 (a thru f)**. Impact of the financial and organizational changes upon the regions varied significantly. The Central/Eastern Gulf Region **(a)** worked through the changes with minimal impact, as did the current Eastern Region **(b)**. Impact in the Midcontinent Region **(c)** was dramatic when the Oklahoma Geological Survey declined to participate in PTTC. Their program had been very active in early years. This gap in the southern portion of the Midcontinent Region (Oklahoma and Arkansas) is being filled starting FY10 with the University of Tulsa, Petroleum Engineering coming on board as a Regional Lead Organization (RLO). In the Rocky Mountain Region **(d)** attendance was impacted more than activity level. One impact of the new business model is that now, with a few exceptions, workshops are held in the Denver area. Fortunately, Denver is the hub of E&P activity for the region. The Texas/Southeast New Mexico Region **(e)** also experienced a dramatic drop in both activity level and attendance, but with FY10 plans to conduct 12 workshops, the regional program is now re-strengthening. In the West Coast Region **(f)**, there was a one-year gap between the University of Southern California and the Conservation Committee of California Oil and Gas Producers coming on board as RLO.

Table 2 summarizes workshop activity for FY09, the most recent fiscal year. Results by quarter are presented in **Appendix B**. As previously noted, 74 workshops (72 regional and two national) were held, drawing 3,638 attendees (avg. = 49 attendees/workshop). Highest attendance occurred in the Rocky Mountain Region (861 attendees). This region has also sponsored, for several years, a "Futures in Energy" student training/internship program that is strongly supported by industry. Attendance in the Eastern and Central/Eastern Gulf regions was in the 600s, followed by the remaining three regions in the 340 to 410 person range. The two Headquarters-coordinated workshops were technology and research needs workshops conducted for DOE in the areas of (a) CO_2 flooding and (b) Appalachian shale gas/water issues.

Figure 3 - Geographic Distribution of Workshop Activity (FY04 – FY09)

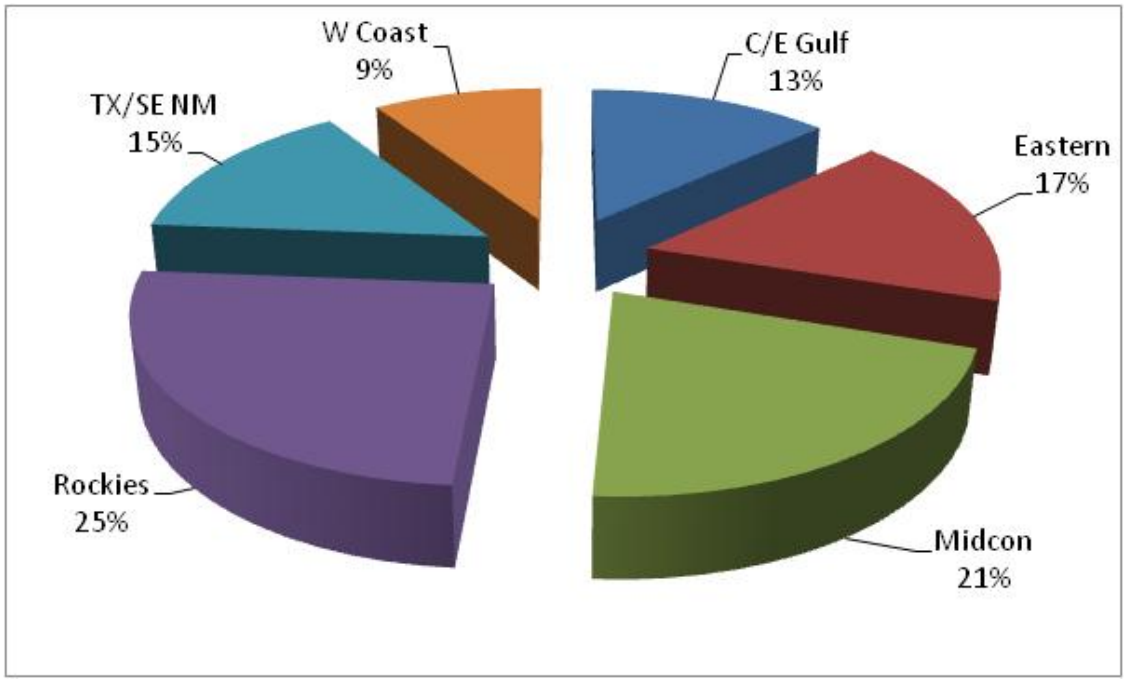


Figure 4 - Geographic Distribution of Workshop Attendance (FY04 – FY09)

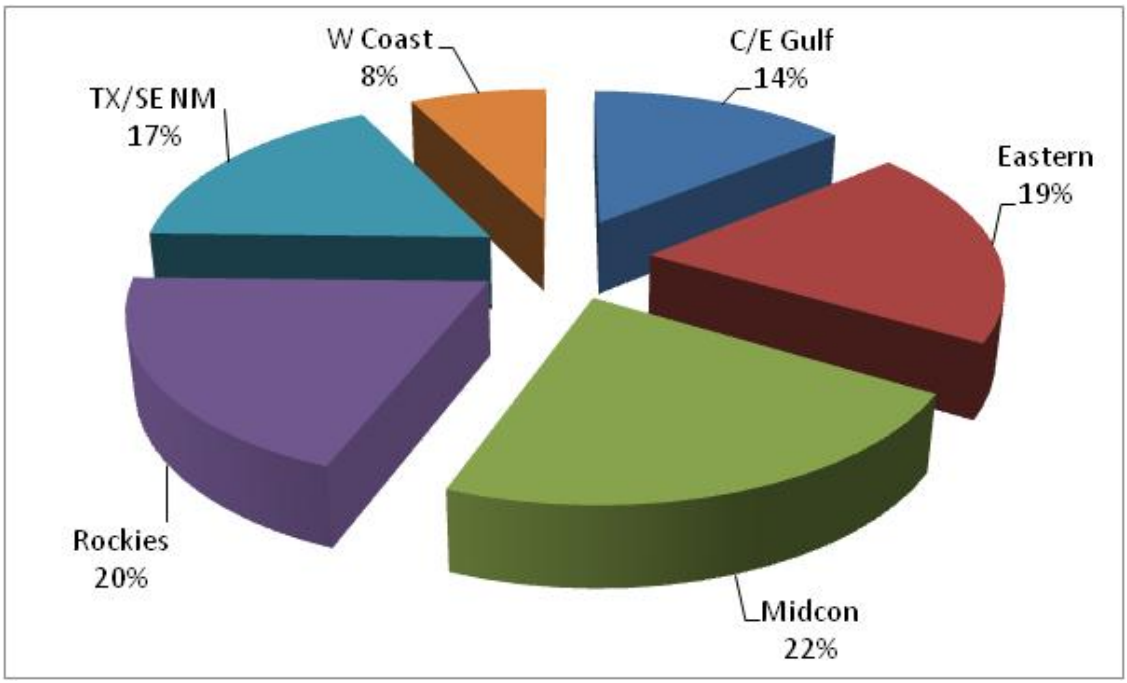


Figure 5 (a) - Central/Eastern Gulf Region History (FY04 – FY09)

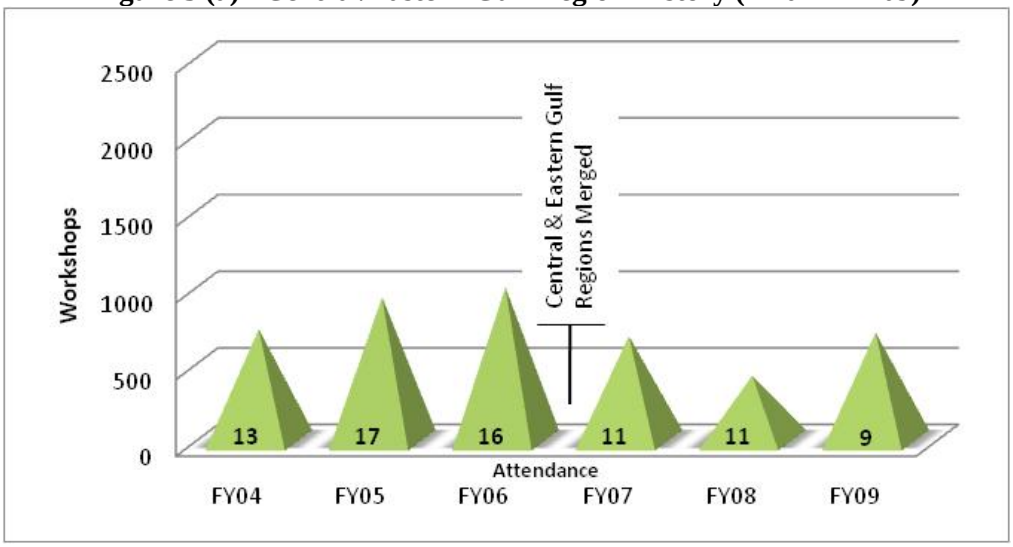


Figure 5 (b) - Eastern Region History (FY04 – FY09)

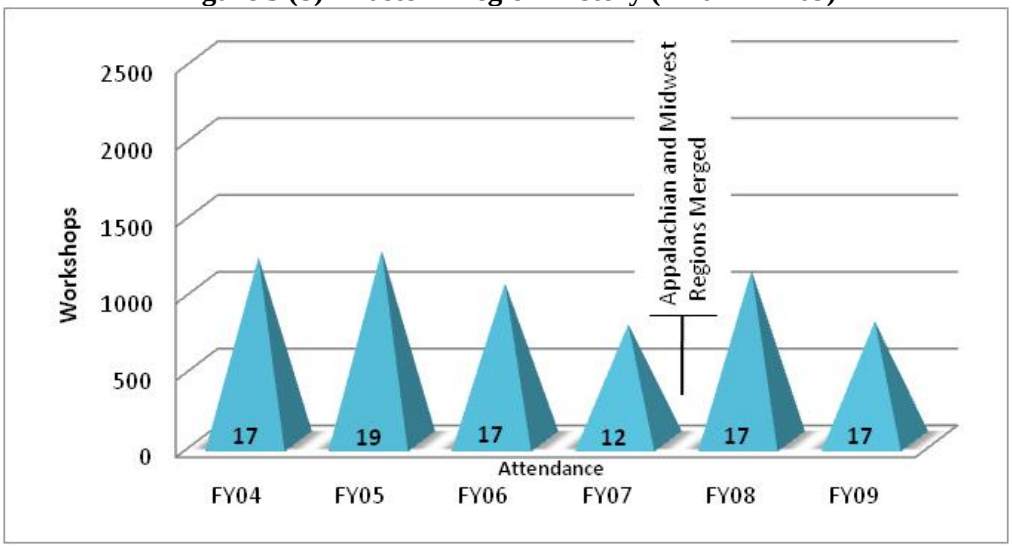


Figure 5 (c) - Midcontinent Region History (FY04-FY09)

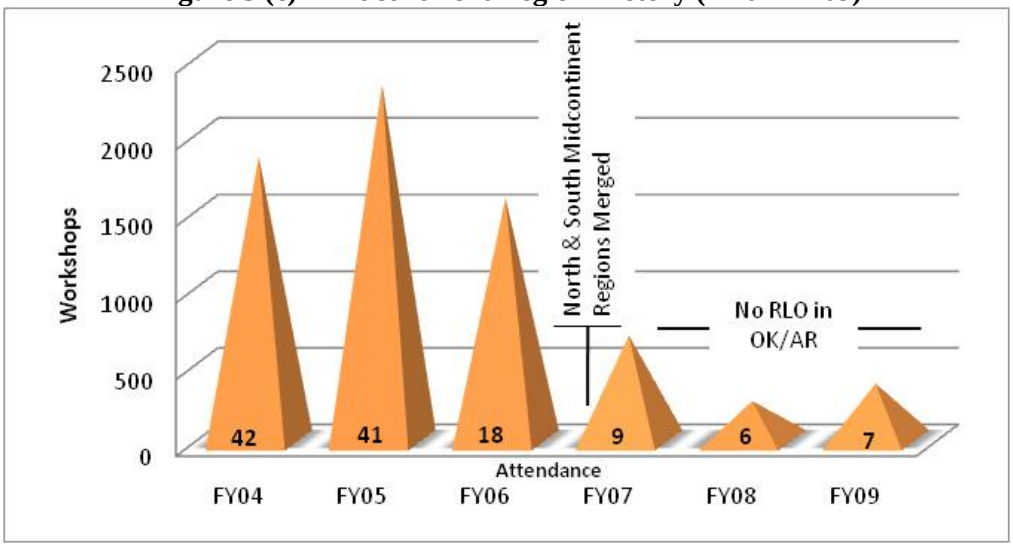


Figure 5 (d) - Rocky Mountain Region History (FY04-FY09)

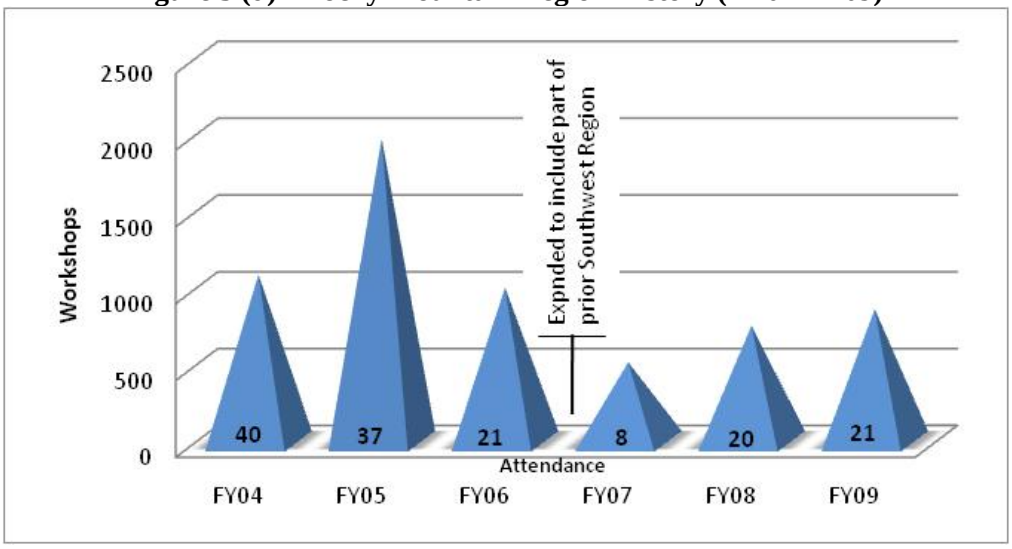


Figure 5 (e) - Texas/Southeast New Mexico Region History (FY04-FY09)

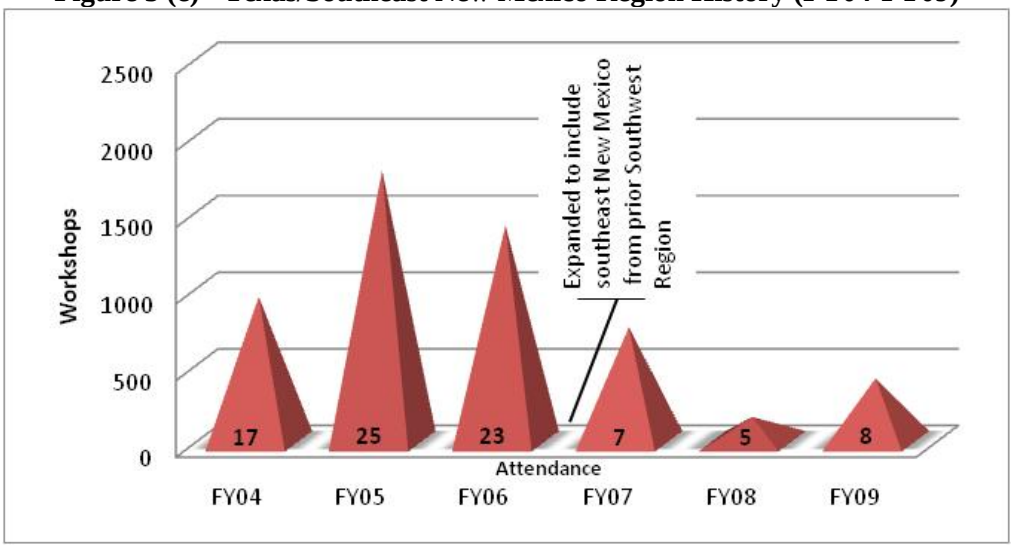


Figure 5 (f) - West Coast Region History (FY04-FY09)

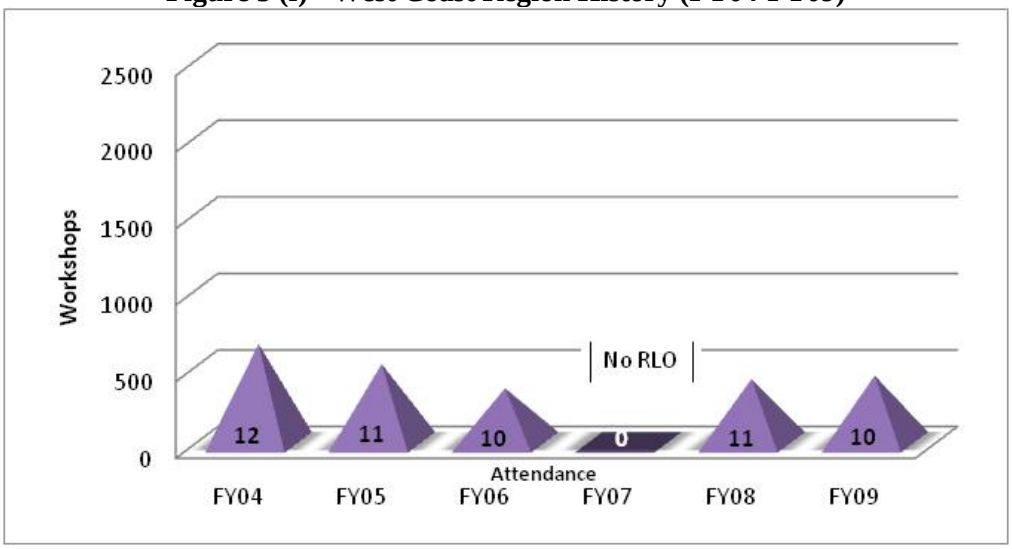


Table 2 - FY09 Activity Summary

Region	Workshops			Comments
	No.	Att. (Avg.)	E&P (%)	
Central/ Eastern Gulf	9	704 (78)	613 (87%)	Workshops during FY09 significantly leveraged DOE-supported research performed at the University of Alabama with involvement of Louisiana State University. Workshops were held in Mississippi, Louisiana and Texas. Dr. Ibrahim Cemen has replaced Ernie Mancini as the RLO Director at Alabama. David Dismukes is serving in an acting capacity at LSU.
Eastern	17	781 (46)	686 (88%)	Eleven of the 17 regional events were organized by West Virginia University. Seven workshops were held in Pittsburgh. All Illinois Basin workshops were held in Evansville, IN. Field experiences were the focus in the Michigan workshop. Shale gas topics were a common them in the Appalachian and Illinois basins.
Midcontinent	7	370 (53)	341 (92%)	Four workshops were conducted in Kansas and three in Oklahoma. Oklahoma workshops were coordinated by Headquarters. Starting in FY10, Mohan Kelkar with the University of Tulsa Petroleum Engineering Department will coordinate workshops for Oklahoma and Arkansas.
Rocky Mountain	21	861 (41)	856 (99%)	Of the regions, the Rocky Mountain Region exhibited the highest attendance. Excluding the cooperative event with RMAG (9/14/09), attendance averaged 26. High attendance is achieved by maintaining high activity. Most FY09 activities were held in the Denver area.
Texas & SE New Mexico	8	411 (51)	410 (99%)	Following a low point in FY08, this regional program is re-strengthening in both activity and attendance. Events were held in four different Texas cities. There were additional workshops planned, some in Midland, that were cancelled when pre-registration remained low. The RLO policy is to "not hold a workshop" if pre-registration will not achieve financial break-even.
West Coast	10	437 (38)	368 (84%)	In most instances, for a given topic, the RLO will conduct workshops in both Bakersfield and Long Beach. In FY09 workshops covered five topics, plus the region supported CCCOGP's Forum. For the most part, topics reinforced the basics of different technology areas in both geology and engineering.
All Regions	**72**	**3,564**	**3,274 (92%)**	
Headquarters	**2**	**74**	**59 (80%)**	Headquarters coordinated two workshops with DOE to present technology advances and identify research needs in (a) CO_2 flooding and (b) Appalachian shale gas.
Total PTTC	**74**	**3,638**	**3,333 (92%)**	

3.0 NATIONAL PROGRAM

There are five essential functions provided by Headquarters (HQ): (1) communications/technology transfer services, (2) outreach, (3) organizational management, (4) RLO coordination and (5) fund raising. Combined, these functions enable PTTC to be a fundamentally regional program with national strength.

3.1 Communications/Technology Transfer Services

Communications/technology transfer services provide synergy among regional programs, move technology across the U.S. and shorten the technology adoption cycle. Four regular services in the communications realm (**Figure 6**) are:

- *Network News newsletter*: Since inception PTTC has published a broadly circulated newsletter. Throughout the contract period, length has been 16 pages. The normal frequency is quarterly. During 2007 and 2008 when PTTC was under financial duress, frequency was less. In 2009 PTTC experimented with alternating "hardcopy" and "electronic only" issues on a two-month frequency. When it was discovered that few readers were accessing the "electronic only" issue, PTTC returned to the regular "hardcopy" quarterly frequency. Circulation for the early fall 2009 newsletter was more than 19,000.

- *Tech Connections Column in The American Oil & Gas Reporter (AOGR)*: The AOGR publication specifically targets independent producers. Throughout the contract period, PTTC has written an invited column with content either (1) drawn from recent PTTC activities or (2) subjects known to be of high interest to industry. PTTC occasionally develops other articles for AOGR. According to AOGR's 2010 media guide, its qualified circulation as of mid-2009 was just over 13,000 readers.

- *Email Tech Alerts* (approximate 3-wk frequency throughout the contract period): Industry, DOE and PTTC technology highlights are provided. Since PTTC went under AAPG management, an AAPG highlight has also been provided. Calendars for soon upcoming PTTC and "other" events are listed. Circulation at the end of FY09 was nearly 9,000 individuals.

- ***www.pttc.org***: PTTC maintains an integrated website network consisting of a national section and six regional sections. Content includes organizational information, calendar information for PTTC and "other" events, technology information, historical workshop information, and industry links sections. Early in the contract period the RLOs also maintained websites, but to reduce costs and improve information consistency, these were discontinued in the 2007 time frame. Some of the RLOs do maintain a basic website for workshop promotion and registration.

3.2 Outreach

Throughout the contract period PTTC maintained an active outreach and exhibit schedule, exhibiting at major professional society meetings, some trade organization meetings and at NAPE/summer NAPE (North American Prospect Expo). In early years PTTC exhibited at more than 10 events per year. Since 2007 PTTC has been more selective, still exhibiting at major industry events but overall reducing the number of shows covered to reduce costs. An exception is that, since PTTC came under AAPG management, it has had a presence at AAPG Section annual meetings. Excluding AAPG Section annual meetings, in FY09 PTTC exhibited at seven meetings. Major events each year are NAPE, summer NAPE, and AAPG and SPE annual meetings. PTTC may exhibit at state/regional trade association meetings if costs are low or creative swaps can be negotiated. PTTC and the Research Partnership to Secure Energy for America (RPSEA) on occasion will share booth space to control costs while still providing each organization an opportunity for exposure.

3.3 Organizational Management

- *Volunteer Board*: PTTC is a not-for-profit corporation whose activities and staff are directed by a volunteer Board. Prior to coming under AAPG's umbrella, PTTC had a large independent Board with more than 20 members. In the transition to becoming a subsidiary of AAPG, PTTC's Bylaws were

revised to create Members (currently only AAPG) and Board size was reduced to seven members. PTTC's Board functions independently, but certain actions (Chair, Board membership, annual budget) are subject to review and confirmation by AAPG's Executive Committee. In a given year, PTTC's Board will typically meet a couple times in person, plus have three or four teleconferences.

- *Staffing*: At the start of the contract period, PTTC had an office in Houston and several employees, led by Executive Director Don Duttlinger. When Duttlinger resigned in the latter part of 2006 and PTTC was experiencing financial duress, several changes were made. Staff became external consultants rather than employees. PTTC closed its Houston office, moving records and equipment to Tulsa for "essentially" storage. PTTC effectively became a virtual organization and remained so at the end of the contract. AAPG manages PTTC through a services contract with Susan Nash, AAPG's Director of Education and Professional Development serving as Principal Investigator for PTTC. Regular consultants include Operations Manager Lance Cole, Director of Business Affairs Kathy Chapman, and webmaster/publications/administrative support person Kristi Lovendahl. As needed, PTTC will retain additional technical and administrative support consultants.

- *Contractual Reporting*: Operations Manager Cole has primary responsibility for required technical reporting, while Director of Business Affairs Chapman has primary responsibility for contract financial reporting.

- *Financial/Contracts/Fiscal*: Director of Business Affairs Chapman provides accounting, contract management and fiscal services for PTTC Management (Nash and Cole), the Board and coordinates RLO contractual/financial interactions. She also coordinates PTTC's annual audit process, which is required since PTTC receives federal funding. As a service to the Board, Chapman also serves as Secretary of PTTC.

3.4 RLO Coordination

The resources available for RLO coordination changed dramatically during the contract period. At the beginning of the contract period when more financial resources were available, the National Project Manager (Cole) could devote a significant amount of time to RLO coordination. When staff was slimmed down to only a consultant Executive Director (Cole), little time remained for RLO coordination. Moving into the AAPG-managed era, there was initially an RLO-Coordinator from among the RLO Directors to assist Operations Manager Cole, but this position was subsequently eliminated for budget reasons. Currently Cole manages the technical side of RLO Coordination while Chapman manages the financial/contractual side.

Coordination issues during the latter half of the contract period included regional restructuring, RLO and RLO Director changes, and adapting to a new regional business model with significantly lower RLO funding. Workshop scheduling is an ongoing coordination task. HQ also seeks to develop and coordinate "traveling" workshops. Traveling workshops are workshops that, because of broad interest in the topic, can be held in several regions. Typically, a traveling workshop is presented by a single instructor. For the convenience of both the instructors and the RLOs, HQ coordinates contracting.

Entering FY10, there are new RLO Directors in several organizations. Additional coaching time by Cole will be required to familiarize new staff with procedures, best practices and contractual/deliverable/reporting requirements. Another overlapping issue is revitalizing regional Producer Advisory Groups (PAGs). During the years of change and financial turmoil, these volunteers drifted away as RLO Directors and national staff alike focused on survival. This task is high priority entering FY10.

3.5 Fund Raising

From inception PTTC's intent has been to transition to a self-funded organization, but it has never been able to achieve that. Modest funding is received from advertising in the newsletter and the website. Some RLOs have also raised modest sponsorship funds to augment funding received from PTTC. When under extreme financial duress during FY07, PTTC developed and solicited both individual and corporate

memberships. Results were very disappointing, only $100K or so of funds were ultimately received. In taking over management of PTTC, AAPG requested that PTTC discontinue its membership program as it was inconsistent with AAPG itself being a member organization. Once it was certain the transfer to AAPG management would occur, PTTC offered a refund to members and the vast majority took it.

During 2008 PTTC implemented a multi-tiered sponsorship program, retaining two marketing consultants to assist in the effort. Although slow, there was some momentum building until fall 2008 when the world financial crisis and subsequent O&G downturn occurred. Sponsorship interest dried up and PTTC stopped pursuing sponsorships. As industry conditions improve, it is anticipated that a sponsorship program of some form will once again be implemented.

During FY09 PTTC focused on federal funding opportunities from its historical DOE source, other DOE programs, and other federal agencies (Environmental Protection Agency, Bureau of Land Management, Department of Labor). PTTC did win DOE's competitive technology transfer solicitation and started a new five-year contract with DOE beginning FY10. It was also successful with other partners in obtaining DOE funding to develop and provide CCS training for the Permian Basin. PTTC has also submitted a mini-proposal to DOE's geothermal program. Proposals to other federal groups are anticipated.

Figure 6 - National Communication Products

- **Synergizing regional programs**
- **Moving technology across the U.S.**
- **Shortening the technology adoption cycle**

4.0 IMPACT OF TECHNOLOGY TRANSFER

There are four approaches that PTTC employed to measure the impact of its technology transfer program: (1) ask the attendees themselves whether they applied technologies they learned about through PTTC, (2) gather individual success stories that provide anecdotal evidence of successful technology transfer, (3) quantitatively estimate PTTC's impact in areas where industry was known to be applying new technology, and (4) document qualitative factors that confirm industry assigns value to PTTC's program.

For several years, including the first couple years of this contract period, PTTC gathered feedback from attendees at regional workshops. A key question posed to them was: *Have you used technology you learned about through PTTC?* Of those who responded, roughly 40% said "Yes" with a similar 40% of those responding providing at least cryptic details of their technology application and production/financial results. Through the years PTTC was also able to capture many "success anecdotes" that were typically reported in annual reports. Qualitatively, supported with some quantitative examples, PTTC had established the effectiveness of its technology transfer effort.

Early in 2005, about 18 months into this contract period, PTTC made a major effort to quantitatively estimate impact in **just eleven areas** where independents were broadly applying technologies. Results of this analysis are included as **Appendix C**. PTTC impact factors were estimated for each area. Those impact factors were an estimate of the % of industry economic activity that was influenced by PTTC activity, considering timing and quantity of PTTC technology transfer activities, industry participation and direct industry feedback about what % of industry value could be attributed to PTTC. Impact factors ranged from five to 25%. Of 1,266 million barrels of oil equivalent reserves that were realized, 88 million barrels could be logically attributed to PTTC activity. Significant operating cost reductions also occurred. Productivity was improved and training requirements reduced. The service provider community also realized significant value.

Three qualitative factors confirm PTTC's value/impact to the domestic O&G producing industry. First, AAPG was willing to step in and rescue PTTC, believing it was of significant interest to its domestic membership and of potential value internationally. Second, through a period of turmoil and now with participant fees dramatically increased, industry participants "keep coming back" to workshop activities. Third, technology developers seek out PTTC for exposure for their developing technologies, and many industry organizations/groups seek out PTTC for promotion of their meetings or events.

APPENDIX A
REGIONAL ACTIVITY, FY04 THROUGH FY09

PTTC Central/Eastern Gulf Coast Region
(Central Gulf & Eastern Gulf Region Merged Into Central/Eastern Gulf Region Effective Start of FY07)

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
AVO Technology	Jackson, MS	10/9/03	38	35 (92%)	71%
E&P Technology Session (US Oil & Gas Assn)	Point Clear, AL	10/15/03	65	58 (89%)	19%
IPAA PTTC mini-session	New Orleans, LA	10/27/03	45	40 (89%)	50%
Reservoir Fluids 2003 PVT and Beyond	Lafayette, LA	11/12/03	60	48 (80%)	10%
Alabama Oil and Gas (Alabama O&G Board)	Tuscaloosa, AL	12/5/03	71	59 (83%)	17%
Soil Remediation (Texas Region)	Tyler, TX	1/21/04	Reported by Texas Region		
Application of Logging Tools for Improving Reservoir Characterization	Baton Rouge, LA	2/3/04	39	15 (38%)	39%
Seismic Micro-Technology, New Tools in the Kingdom Suite Version 7.3	Raymond, MS	2/16/04	11	4 (36%)	91%
Drilling and Completion Technologies for Deep Shelf Gas (New Orleans Geol. Society, Eastern Gulf)	New Orleans, LA	4/5/04	28	27 (98%)	40%
International Coalbed Methane Symposium	Tuscaloosa, AL	5/3-4/04	197	139 (71%)	4%
Improving Operations From An Environmental Perspective (MS State Board of Registered Professional Geologists, AAPG Division of Professional Affairs)	Jackson, MS	5/26/04	38	25 (66%)	50%
Coalbed Methane Resources in the Southeast (ULL Energy Institute)	Lafayette, LA	6/8/04	84	65 (77%)	46%
Reservoir Simulation and Modeling: North Blowhorn Creek, Vocation Field, and Womack Hill Field	Jackson, MS	9/2/04	25	16 (64%)	92%
Seismic Attributes for Reservoir Characterization	Jackson, MS	9/22/04	24	20 (83%)	92%
Workshop History: FY04 Attendance (13 events)			**725**	**551 (76%)**	
2004 O&G Forum (US O&G Assn)	Jackson, MS	10/6/04	126	110 (87%)	49%
Understanding O&G Reservoir Using Mat. Balance	Lafayette, LA	10/21/04	45	42 (93%)	82%
Energy Summit 2004 (Center for Energy Studies)	Baton Rouge, LA	10/21-22/04	109	76 (70%)	6%
Alabama O&G Seminar (Alabama State O&G Board, Black Warrior Assn Landmen, O&G Section of State Bar)	Tuscaloosa, AL	10/28-29/04	115	91 (79%)	34%
Well Abandonment Methods & Regulations	Lafayette, LA	11/10/04	33	28 (85%)	52%
Reservoir Engineering Symposium, From The Matrix To The Market (ULLA)	Lafayette, LA	12/2/04	50	41 (82%)	48%
Productivity and Economic Potential of Inactive/Marginal Wells in LA (ChevronTexaco)	New Orleans, LA	12/7/04	33	30 (91%)	39%
Sequence Stratigraphy for Explorationists	Jackson, MS	1/12/05	36	24 (67%)	64%
Low Cost Oil and Gas Recovery Methods	Shreveport, LA	1/27/05	41	36 (88%)	51%
Interpreting Seismic Data on Kingdom 2d/3d PAK	Raymond, MS	2/7/05	7	6 (86%)	57%
Controlling Sand Production (Texas)	Houston, TX	3/2/05	To be reported by Texas Region		
GeoPlus PETRA Basic Training for Beginners	Raymond, MS	3/16-17/05	20	17 (85%)	75%
Louisiana Coalbed Methane, workshop & field trip (ULL Energy Institute, Louisiana Geol. Survey)	Natchitoches, LA	3/17/05	30	20 (67%)	57%
The New Phase I ESA: "All Appropriate Inquiry" and the Nebulous Nature of Total Petroleum Hydrocarbons (MS Board Registered Petroleum Geologists, AAPG DPA)	Jackson, MS	4/7/05	31	28 (90%)	50%
Cost Effective Horizontal Well Technology	Lafayette, LA	5/12/05	26	18 (69%)	58%
International Coalbed Methane Symposium	Tuscaloosa, AL	5/16-20/05	191	163 (85%)	70%

Stimulation of Watered-Out Inactive/Marginal Wells with Dual Completions	Lafayette, LA	5/24/05	22	21 (95%)	82%
GeoPlus PETRA Interm. Cross-Section Techniques	Raymond, MS	6/7-8/05	19	18 (5%)	58%
Material Balance, Modeling and Simulation, Reservoir Engineering Tools (Core Labs, w C. Gulf)	Houston, TX	6/29/05	To be reported by Texas Region		
An Integrated Coalbed Methane Exploration Model: Defining Coalbed Methane Exploration Sweetspots (AAPG DPA, MS Board of Reg. Prof. Geologists)	Jackson, MS	9/7/05	Canceled due to Hurri-cane		
Using Technology To Reduce Severance Taxes (Chevron)	New Orleans, LA	9/14/05			
Horizontal Well Technologies and CBM Applications (Texas)	Houston, TX	9/22/05			
Workshop History: FY05 Attendance (17 events)			**934**	**769 (82%)**	
US O&G Association Annual meeting/workshop	Jackson, MS	10/12/05	125	108 (86%)	56%
Energy Summit 2005: Louisiana's Integration With Global Energy Markets (Center for Energy Studies)	Baton Rouge, LA	10/19-20/05	71	60 (85%)	
PETRA Intermediate Mapping Techniques	Raymond, MS	10/25-26/05	22	21 (95%)	75%
Work Production Performance for Independents	Lafayette, LA	11/3/05	11	11 (100%)	80%
PETRA Data Loading	Raymond, MS	11/8-9/05	17	16 (94%)	85%
O&G Seminar/Workshop (AL O&G Board, Black Warrior Landmen, O&G AL State Bar)	Tuscaloosa, AL	11/18/05	114	102 (89%)	65%
Material Balance, Modeling and Simulation; Reservoir Engineering Tools Past, Present & Future	Lafayette, LA	12/7/05	41	27 (66%)	63%
Horizontal Well Technologies and CBM Applications (Texas)	Houston, TX	2/8/06	Reported by Texas		
Core Workshop—Upper Jurassic Smackover Thrombolite Facies and Reservoirs; Vocation, Appleton, and Little Cedar Creek Fields, AL	Tuscaloosa, AL	3/8/06	46	25 (54%)	54%
Work Production Performance Toolbox (SPE)	Shreveport, LA	3/23/06	28	26 (93%)	70%
DNR's SONRIS Fundamentals (Louisiana DNR)	Monroe, LA	4/19/06	44	31 (70%)	18%
Environmental Workshop (MSBRPG & AAPG DPA)	Jackson, MS	5/11/06	55	32 (58%)	65%
International Coalbed Methane Symposium (University of Alabama & Others)	Tuscaloosa, AL	5/22-26/06	240	189 (79%)	70%
Stimulation of Watered-out Inactive/Marginal Wells with Dual Completions (Update with Case Studies)	Shreveport, LA	5/23/06	24	18 (75%)	60%
CBM Association of Alabama (1st effort w them)	Orange Beach, AL	5/31 6/2	102	99 (97%)	0%
Calculating a Wellhead Price	*Baton Rouge, LA*	*9/11/06*	*25*	*20 (80%)*	
Gravity Stable EOR Forum	Shreveport, LA	9/13/06	33	29 (88%)	51%
Workshop History: FY06 Attendance (16 events)			**998**	**814 (82%)**	
Red Hills Mine Seminar/Field Trip	Ackerman, MS	10/7/06	48	9 (19%)	10%
U.S. Oil and Gas Association	Jackson, MS	10/11-12/06	131	110 (84%)	85%
Mature Well Performance Prediction	Lafayette, LA	10/26/06	24	24 (100%)	80%
Alabama Oil & Gas Seminar	Birmingham, AL	10/27/06	136	124 (91%)	85%
Assessment of Deep Gas Resource; Mississippi Interior and North Louisiana Salt Basins	Tuscaloosa, AL	11/9/06	21	6 (29%)	29%
Annual Reservoir Engineering Symposium; Reservoir Fluid Sampling, Deep Water Oil Quality and Unconventional Gas Reservoirs	Lafayette, LA	12/7/06	54	37 (69%)	60%
Basin Analysis and Petroleum System Characterization, North Louisiana Salt Basin	Tuscaloosa, AL	2/20/07	32	15 (47%)	79%
Use of Transgressive-Regressive Sequences in Petroleum Exploration	Tuscaloosa, AL	2/20/07	32	15 (47%)	79%
Basin Analysis and Assessment of Deep Gas Resource, North Louisiana Salt & Mississippi Interior Salt Basins	Shreveport, LA	3/27/07	51	42 (82%)	50%

Carbonate Reservoir Characterization, Case Study of Womack Hill Field, Southwest Alabama (Center for Sedimentary Basin Studies, MS State Board of Registered Professional Geologists, AAPG DPA)	Tuscaloosa, AL	6/7/07	22	13 (59%)	75%
Tech Session @ Coalbed Methane Association of Alabama	Orange Beach, AL	6/27-29/07	130	124 (95%)	90%
Workshop History: FY07 Attendance (11 events)			**681**	**519 (76%)**	
Technologies and Exploitation Strategies for Developing Naturally Fractured Reservoirs	Shreveport, LA	10/10/07	53	50 (94%)	51%
Natural & Anthropogenic Subsidence Impact on Louisiana Coasts	Baton Rouge, LA	1/24/08	70	17 (24%)	17%
Deep Gas Reservoir Play, Central and Eastern Gulf	Jackson, MS	2/27/08	29	26 (90%)	45%
U.S. Oil & Gas Technology Summit (U.S. Oil Expo Group)	Natchez, MS	4/6-8/08	36	36 (100%est.)	25% est.
Enhanced Oil Recovery and CO_2 EOR (Shreveport Geological Society)	Shreveport, LA	6/4/08	39	33 (85%)	70% est.
Microbial Reservoir Play, Central and Eastern Gulf (Shreveport Geological Society)	Shreveport, LA	7/23/08	15	12 (80% est.)	70% est.
Little Cedar Creek Field Case Study (Mississippi Geological Society)	Jackson, MS	7/31/08	66	61 (92%)	70% est.
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain	Tuscaloosa, AL	8/6/08	20	14 (70%)	70% est.
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain (New Orleans Geological Society)	New Orleans, LA	8/12/08	18	14 (80% est.)	70% est.
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain (Mississippi Geological Society)	Jackson, MS	9/23/08	11	9 (82%)	70% est.
Workshop History: FY08 Attendance (11 events)			**422**	**332 (79%)**	
Bossier-Haynesville Shale, North Louisiana Salt Basin, Geological & Geochemical Characterization (Mississippi Geological Society)	Jackson, MS	11/5/08	48	44 (92%)	44%
Bossier-Haynesville Shale, North Louisiana Salt Basin, Geological & Geochemical Characterization (Fort Worth Geol. Society)	Fort Worth, TX	2/11/09	225	202 (90% est.)	
Lowstand Wilcox Sand Reservoir Potential in Northeast Gulf of Mexico (Presentation to Houston Geological Society, Mancini)	Houston, TX	3/9/09	110	99 (90% est.)	
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins in the Northern Gulf of Mexico (Houston Geological Society)	Houston, TX	3/9/09	77	69 (90% est.)	
Alternative Energy; Sustainable Development in a Challenging Economy (LSU Center for Energy Studies)	Baton Rouge, LA	4/22/09	111	89 (80% est.)	
Louisiana Oil and Gas Symposium (Baton Rouge Geological Society, Louisiana Geological Survey, LSU Center for Energy Studies, Louisiana Oil and Gas Association)	Baton Rouge, LA	5/19-20/09	96	77 (80% est.)	
Microbial Facies and Reservoirs (University of Alabama)	Tuscaloosa, AL	6/4/09	9	5 (56%)	
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain (GCAGS)	Shreveport, LA	9/25/09	20	20 (100%)	
Water/Gas Shutoff and Conformance Control: What To Do Where	Lafayette, LA	9/30/09	8	8 (100%)	
Workshop History: FY09 Attendance (9 events)			**704**	**613 (87%)**	

PTTC Eastern Region
(Appalachian & Midwest Merged Into Eastern Region Effective Start of FY08)

Topic	Location	Date	Attendance		Repeat Attend.
(main cosponsors in parentheses)			Total	# (%) Industry	
Improving The Bottom Line By Enhancing Your Data Management Skills	Morgantown, WV	10/2/03	28	22 (79%)	64%
Well Log Interpretation and Reservoir Characterization of Ordovician and Cambrian Reservoirs, Appalachian Basin	Columbus, OH	10/6/03	38	24 (63%)	75%
Trenton-Black River Reservoirs in Michigan	Mt. Pleasant, MI	10/23/03	91	73 (92%)	64%
Coalbed Natural Gas (WV Development Office)	Roanoke, WV	10/29/03	165	136 (82%)	
Hydrogen (WV Development Office)	Roanoke, WV	11/19/03	67	36 (53%)	
Energy Infrastructure (WV Development Office)	Roanoke, WV	12/11/03	80	52 (65%)	
Internet Mapping Service (IMS) and Illinois Basin Pay-Map Series	Mt. Vernon, IL	1/29/04	45	38 (84%)	60%
Produced Water and Associated Issues (O&G Assn)	Evansville, IN	3/4/04	37	31 (84%)	93%
PUMP II Deliverables, Illinois Pay-Map Series and IMS	Evansville, IN	3/5/04	60	60 (100%)	50%
Michigan Field Experience, Focus on the Niagaran (N. Michigan SPE)	Mt. Pleasant, MI	3/19/04	161	134 (83%)	69%
Desktop Mapping; More Bang For The Buck From Your Well Data	Mt. Vernon, IL	3/31/04	42	30 (71%)	21%
Horizontal Drilling, A Technology Update for the Appalachian Basin (Ohio Geol. Survey, OOGA)	Salt Fork, OH	5/27/04	78	69 (88%)	60% est
Trenton-Black River Play Update (WV Geol. Surv.)	Washington, PA	6/7/04	54	36 (67%)	72%
Introduction to GeoPlus PETRA (KY Geol. Survey)	Lexington, KY	6/15/04	29	11 (38%)	
An Integrated Coalbed Methane Exploration Model; Defining CBM Exploration Sweet Spots	Morgantown, WV	7/19/04	53	51 (96%)	
Well Safety for Well Tenders	Meadville, PA	9/2/04	66	66 (100%)	
Petroleum Systems of the Michigan Basin, A Look at Undiscovered Oil and Gas Resources (Michigan O&G Association)	Grand Rapids, MI	9/23/04	106	74 (70%)	44%
FY04 Attendance (17 events)			**1,200**	**943 (79%)**	
Exploration & Development of Fractured Reservoirs	Columbus, OH	10/6/04	63	38 (60%)	56%
Pumpers & Well Operators Training	Mt Carmel, IL	10/12/04	80	72 (90%)	19%
Well Safety for Well Tenders	Marietta, OH	10/21/04	64	64 (100%)	3%
Annual Illinois Basin CBM Symposium	Evansville, IN	11/16/04	121	103 (85%)	28%
Crash Course in Log Interpretation	Grayville, IL	12/9/04	73	60 (82%)	68%
Practical Power Cost Reduction for Old Oil Fields	Grayville, IL	1/19/05	40	37 (90%)	62%
SPCC Compliance Workshop (Ind. Prod. Tri-State))	Evansville, IN	3/2/05	47	41 (87%)	80%
Geochemical Exploration (Ind. Prod. Tri-State)	Evansville, IN	3/2/05	50	45 (90%)	82$
Kiker presentation @ Ind. Prod. Tri-State	*Evansville, IN*	*3/4/05*	71	65 (92%)	80% est
Introduction to Carbonate Reservoirs (PAPG)	Pittsburgh, PA	3/8/05	73	59 (81%)	59%
Michigan Field Experiences, Focus on the Antrim (Michigan Geological Society, SPE N. Michigan)	Mt. Pleasant, MI	3/18/05	185	152 (82%)	54%
Pumpers & Well Operations Training (IL O&G)	Grayville, IL	5/20/05	62	50 (81%)	46%
Recent Developments in Upper Devonian Sandstone Plays	Pittsburgh, PA	5/26/05	105	93 (89%)	
Central Kentucky Trenton-Black River Outcrop Analogs (KY Geol. Survey)	Lexington, KY	6/1/05	36	18 (50%)	
Outcrop Analog for Trenton-Black River Hydrothermal Dolomite Reservoirs	Albany, NY	6/7/05	37	25 (68%)	
Well Testing, Theory and Practice	Morgantown, WV	8/16/05	23	21 (91%)	71%
Well Log Analysis (AAPG Eastern Section)	Morgantown, WV	9/17-18/05	38	30 (79%)	27%
From Rocks to Models, 3D Reservoir Characterization and Modeling	Morgantown, WV	9/21/05	30	18 (60%)	72%

Pumpers Workshop (Illinois O&G Assn.)	Salem, IL	9/30/05	46	44 (96%)	41%
FY05 Attendance (19 events)			**1,244**	**1,035 (83%)**	
Filling Your Pipeline and Storage Tanks (Southern Ohio Oil and Gas Association)	Marietta, OH	10/13/05	50	50 (100%)	
U.S. Geological Survey Basin Assessment of Remaining O&G Reserves in Michigan Basin	Mt. Pleasant, MI	10/20/05	159	116 (73%)	
Geochemical Exploration for Oil and Gas Success; Strategies for Success (Tennessee O&G Assn.)	Knoxville, TN	10/25/05	15	15 (100%)	47%
Illinois Basin CO2 Operational Workshop (Midwest Geological Sequestration Consortium)	Evansville, IN	11/15/05	67	38 (57%)	63%
Internet Mapping Services and Available Digital Well Data (Illinois O&G Association)	Evansville, IN	3/1/06	67	47 (70%)	75%
Basic Open-Hole Log Interpretation	Grayville, IL	3/23-24/06	41	25 (61%)	78%
Michigan Field Experiences, Carbonate Reservoirs	Mt. Pleasant, MI	3/23/06	164	131 (80%)	
Well Control	Washington, PA	5/16/06	27	26 (96%)	27%
Wellbore Damage Removal (Downhole Fluidics)	Traverse City, MI	5/18/06	32	22 (69%)	75%
Drilling and Completion Safety Seminar (Southern Ohio O&G Association)	Marietta, OH	5/23/06	98	98 (100%)	16%
Drilling and Completion Technology Updates	Cambridge, OH	5/31/06	41	40 (98%)	51%
Carbonate Reservoir Log Interpretation	Grayville, IL	6/13-14/06	36	24 (67%)	89%
Introduction to ArcGIS Software (KY Geol. Survey)	Lexington, KY	7/27-28/06	24	17 (71%)	17%
Forecasting Waterfloods Using Reservoir Grail (Grail Quest)	Columbus, OH	8/29/06	22	19 (86%)	59%
Stimulation Effectiveness/Imaging	Pittsburgh, PA	9/13/06	139	131 (94%)	60%
Acquisition and Divestiture Analysis	Morgantown, WV	9/20/06	35	31 (89%)	63%
Explosives Safety (Core Lab)	Morgantown, WV	9/27/06	13	13 (100%)	38%
FY06 Attendance (17 events)			**1,030**	**843 (82%)**	
Reservoir Engineering for Geologists (AAPG Eastern Section)	Buffalo, NY	10/7/06	26	26 (100% est)	
Hydrothermal Dolomite Reservoirs (AAPG Eastern Section, NY State Geological Association)	Buffalo, NY	10/11/06	52	40 (77%)	
Maintaining and Repairing Casing Integrity (Illinois O&G Association)	Evansville, IN	10/27/06	89	85 (96%)	
Carbonate Reservoir Characterization (Michigan O&G Association)	Kalamazoo, MI	11/10/06	25	17 (68%)	72%
Oil & gas forum; unconventional plays and research needs (RPSEA)	Morgantown, WV	2/15/07	67	36 (54%)	39%
Basic Open Hole Log Interpretation (Weatherford, Appalachian Geological Society)	Charleston, WV	2/26-27/07	50	50 (100% est)	
Horizontal Drilling in Mature Fields; Complex Well Technology for Independents (Illinois O&G Assoc.)	Evansville, IN	2/28/07	100	95 (95%)	
Basic Open Hole Log Interpretation (Weatherford, SPE Pittsburgh, Pittsburgh Association of Petroleum Geologists)	Pittsburgh, PA	3/1-2/07	50	50 (100% est)	
Michigan Field Experiences; Focus on Hydrothermal Dolomite, Shallow Gas and New Technologies (SPE Northern Michigan)	Mt. Pleasant, MI	3/22/07	144	118 (82%)	
Carbonate Reservoir Characterization, Workshop & Short Course (Michigan O&G Association)	Kalamazoo, MI	5/4/07	20	11 (55%)	
The Digital Revolution; Archive, Organize and Deliver	Morgantown, WV	6/5/07	36	25 (69%)	52%
Comparative Anatomy of Eastern Shale Plays	Morgantown, WV	6/21/07	102	81 (79%)	42%
FY07 Attendance (12 events)			**761**	**634 (83%)**	
Seizing Opportunities in a Mature Basin (Michigan O&G Association)	Gaylord, MI	10/18/07	67	57 est. (85%)	75% est.
The Role of Fractures in the Devonian Black Shale Gas Play	Morgantown, WV	1/8-9/08	188	166 (88%)	19%
CO2 Injection Projects: the Experience, the Technology and the Future	Morgantown, WV	2/12/08	40	18 (45%)	24%
Fractured Reservoirs	Mt. Vernon, IL	2/18/08	68	61 (90% est.)	Not Avail.

Petroleum Potential of Under-explored Lower Paleozoic Units in Illinois (Illinois O&G Association)	Evansville, IN	3/5/08	118	106 (90% est.)	Not Avail.
Michigan Field Experiences	Mt. Pleasant, MI	3/20/08	186	144 (77%)	75% est.
Carbonate Reservoirs	Morgantown, WV	3/25/08	42	38 (90%)	
Tuscola Quarry Field Trip/Core Workshop Silurian Devonian	Champaign, IL	4/17/08	20 est.	20 (100% est.)	
Drilling and Completion in the Shales of Appalachia (Ohio Geological Society)	Cambridge, OH	5/29/08	119	116 (97%)	33%
Devonian Shale field trip	Erie, PA	5/30-31/08	50	50 (100%)	
Structural Principles and Trap Geometries in the Northern Appalachians (Pittsburgh Association of Petroleum Geologists)	Morgantown, WV	6/10/08	54	49 (91%)	64%
Appraising and Developing Coalbed and Shale Gas Reservoirs	Morgantown, WV	6/20-21/08	28	27 (96%)	43%
Basic Open Hole Log Interpretation (Weatherford)	Morgantown, WV	9/24/08	26	24 (93%)	39%
Basic Open Hole Log Interpretation (Weatherford)	Morgantown, WV	9/25/08	18	11 (61%)	22%
Gas Well Deliquification Options, Marcellus Shale (Weatherford)	Morgantown, WV	9/25/08	28	28 (100%)	43%
Reservoir Characteristics of the Trenton-Black River in Michigan, Presentations/Core Wkshp	Kalamazoo, MI	9/25/08	33 (Sellout)	30 (90% est.)	60% est.
Reservoir Characteristics of the Trenton-Black River in Michigan, Presentations/Core Wkshp	Kalamazoo, MI	9/26/08	32	29 (90% est.)	60% est.
FY08 Attendance (17 events)			**1,114**	**971 (87%)**	
More! Rocks In Your Head	Pittsburgh, PA	10/11/08	20	0 (0%)	
Geology & Geophysics Applied in Industry	Pittsburgh, PA	10/11/08	24	0 (0%)	
Shale Gas Project Planning	Pittsburgh, PA	10/11-12/08	42	42 (100%)	
Putting It All Together, Optimizing Frac Designs	Pittsburgh, PA	10/15/08	50	50 (100%)	
Computer Mapping for Petroleum Exploration	Pittsburgh, PA	10/15/08	50	50 (100%)	
Advanced Logging (Appalachian Geol. Soc.)	Morgantown, WV	2/12/09	69	55 (80%)	
Computer Mapping for Petroleum Geologists (Illinois Geological Survey, IL O&G Assoc.)	Evansville, IN	3/4/09	40 est.	36 (90% est.	
Appalachian – Unconventional Since 1859, Take 2 (Pittsburgh Assoc. of Petr. Geologists)	Pittsburgh, PA	3/19/09	112	103 (92%)	
Michigan Field Experiences (several sponsors)	Mt. Pleasant, MI	3/26/09	167	150 (90% est.)	
Keys to Complex Well Economic Success	Morgantown, WV	5/14/09	33	32 (97%)	
Applied Reservoir Geology for Engineers	Pittsburgh, PA	7/28/09	25	18 (72%)	
Reservoir Engineering for Petroleum Geologists (Ohio Geological Society)	Columbus, OH	9/1-2/09	22	20 (91%)	
Field Trip: Sedimentology, Stratigraphy and Hydrocarbon Potential of the New Albany Shale in the Illinois and Appalachian Basins of the Eastern U.S. (AAPG Eastern Section)	Evansville, IN	9/19/09	43	43 (100% est.)	
Appraising and Developing Shale Gas Reservoirs (AAPG Eastern Section, AAPG Energy Minerals)	Evansville, IN	9/20/09	34	34 (100% est.)	
Field trip/core workshop: The Geneva Dolomite (Devonian) in the Illinois Basin (AAPG Eastern S)	Evansville, IN	9/23/09	29	29 (100% est.)	
Appraising and Developing Coalbed Methane Reservoirs (AAPG Eastern Section, AAPG EMD)	Evansville, IN	9/23/09	14	14 (100% est.)	
Petroleum Geology and Geochemistry for Thermogenic Shale-Gas Evaluation: A Primer for Engineers and Scientists Focused on Marcellus Exploration and Development in the Appalachian Basin (SPE Eastern Region)	Charleston, WV	9/23/09	32	28 (88%)	
FY09 Attendance (17 events)			**781**	**686 (88%)**	

PTTC Midcontinent Region
(North Midcontinent & South Midcontinent Regions Merged Into Midcontinent Region Effective Start of FY07)

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
Lunch and Learn: Evaluating Hydraulic Fractured Gas Wells (AOGC/SPE)	*Ft. Smith, AR*	*10/1/03*	*32*	*32 (100%)*	*0%*
AAPG Midcontinent PTTC Session	Tulsa, OK	10/13/03	40	30 (75%)	50%
Polymer Treatments, High Water Cut Wells (MWC)	Tulsa, OK	10/14/03	25	24 (96%)	32%
Polymer Treatments, High Water Cut Wells (MWC)	Oklahoma City, OK	10/15/03	22	20 (91%)	30%
Cromwell Play (Oklahoma Geological Survey)	Norman, OK	10/22/03	87	72 (83%)	93%
Crash Course in Log Analysis: An Excel Spreadsheet (Kansas Geological Survey)	Lawrence, KS	10/23/03	16	14 (87%)	38%
Practical Log Analysis Guide to O&G Fields in Kansas (Kansas Geological Survey)	Lawrence, KS	10/24/03	13	10 (77%)	23%
Trouble Shooting Rod-Pumped Wells (MWC)	Woodward, OK	11/4/03	24	24 (100%)	52%
Lunch and Learn: New Tilted Bed Fracturing Model (AOGC/SPE)	*Ft. Smith, AR*	*11/5/03*	*24*	*24 (100%)*	*50%*
Coalbed Methane Forum (SPE Wichita Luncheon)	*Wichita, KS*	*11/05/03*	*42*	*38 (90%)*	*50%*
Trouble Shooting Rod-Pumped Wells (MWC)	Pawhuska, OK	11/6/03	27	22 (81%)	48%
Cromwell Field Trip (Oklahoma Geological Survey)	Ada, OK	11/12-13/03	40	29 (73%)	90%
Cromwell Play (OGS, OCGS)	Oklahoma City, OK	11/17/03	27	23 (85%)	74%
Cromwell Play (OGS, TGS)	Tulsa, OK	12/3/03	28	23 (82%)	68%
Basics of Gas Quality and Gas Processing (MWC)	Tulsa, OK	1/14/04	26	24 (92%)	19%
Basics of Gas Quality and Gas Processing (MWC)	Oklahoma City, OK	1/15/04	21	19 (90%)	19%
Oklahoma Aggregates Association (field trip)	Oklahoma City, OK	2/4/04	48	48 (100%)	
Oklahoma Aggregates Association (meeting)	Oklahoma City, OK	2/5/04	132	132 (100%)	
Asphaltene and Paraffin (MWC)	Oklahoma City, OK	2/4/04	23	23 (100%)	35%
Asphaltene and Paraffin (MWC)	Tulsa, OK	2/10/04	27	25 (93%)	26%
Asphaltene and Paraffin (MWC)	Pawhuska, OK	2/11/04	7	7 (100%)	29%
Case Studies of Exploitation of a Mature Reservoir in Kansas Through Technology Applications	Wichita, KS	2/24/04	40	34 (85%)	78%
Case Studies of Exploitation of a Mature Reservoir in Kansas Through Technology Applications	Hays, KS	2/25/04	33	30 (90%)	36%
Lunch and Learn: SPE President (AOGC, SPE)	*Ft. Smith, AR*	*2/17/04*	*35*	*35 (100%)*	
Oil and Gas Measurement (MWC)	Enid, OK	3/2/04	17	17 (100%)	7%
Lunch and Learn: Bore Hole Imaging (AOGC, SPE)	*Ft. Smith, AR*	*3/3/04*	*40*	*40 (100%)*	
Unconventional Energy Resources in the Southern Midcontinent (Oklahoma Geological Survey)	Oklahoma City, OK	3/9-10/04	344	310 (90%)	53%
Oil and Gas Measurement (MWC)	Ada, OK	3/9/04	3	3 (100%)	0%
Reading The Rocks From Wireline Logs (Kansas Geological Survey)	Lawrence, KS	3/12/04	24	20 (83%)	42%
Oil and Gas Measurement (MWC)	Tulsa, OK	3/16/04	27	25 (93%)	30%
Oil and Gas Measurement (MWC)	Oklahoma City, OK	3/17/04	32	31 (97%)	38%
Reducing Rod Pump Expenses (SPE Wichita Luncheon)	*Wichita, KS*	*3/17/04*	*26*	*25 (96%)*	*77%*

Petroleum Technology Fair 2004	Wichita, KS	3/24/04	82	70 (85%)	54%
Lunch and Learn: Why Shut The Well In, Already Got the Data (AR O&GC, SPE Ft. Smith)	*Fort Smith, AR*	*4/14/04*	*25*	*25 (100%)*	
Independents' Day @ SPE/DOE IOR Symposium (South Midcontinent)	Tulsa, OK	4/20/04	41	35 (85%)	10%
AAPG Student Expo & Field Trip	Norman, OK	4/22-24/04	190 @ expo; 15 on field trip		
Optimized Gas Well Completions and Operations (AR O&GC, SPE Ft. Smith)	*Fort Smith, AR*	*5/19/04*	23	23 (100%)	
Coalbed Methane (AOGC, OGS)	Fort Smith, AR	7/22/04	59	54 (92%)	
Jackfork and Atoka Deepwater Reservoirs (OGS)	Norman, OK	8/18/04	75	53 (71%)	84%
Reducing Well Failure Frequency	Wichita, KS	9/8/04	50	43 (86%)	68%
Tech Session @ Eastern Kansas O&G Association Annual meeting	Chanute, KS	9/17/04	65	63 est (97%)	
Methods of Recompleting Wells and Workovers	El Dorado, AR	9/29/04	53	50 (94%)	43%
Lunch and Learn: Arkoma Basin Roots of Managed Pressure Drilling In Marine Environments (SPE)	*Fort Smith, AR*	*9/30/04*	*26*	*19 (73%)*	
Workshop History: FY04 Attendance (42 events)			**1,852**	**1,668 (90%)**	
Crash Course in Log Analysis, Excel SS	Lawrence, KS	10/14/04	20	20 (100%)	60%
PfEFFER Log Analysis Software	Lawrence, KS	10/15/04	12	12 (100%)	100%
Stratigraphic & Structural Evolution of the Ouachita Mountains & Arkoma Basin (OGS), workshop	Poteau, OK	10/21-23/04	72	63 (88%)	65%
Stratigraphic & Structural Evolution of the Ouachita Mountains & Arkoma Basin (OGS), field trip	Poteau, OK	10/21-23/04	72	63 (88%)	65%
1st Annual Midcontinent CBM Symposium (OIPA)	Tulsa, OK	11/7-9/04	171	157 (92%)	13%
Practical Reservoir Characterization and Modeling Using Free Web-based Software Tools and Data	Lawrence, KS	11/16/04	10	8 (80%)	50%
Springer Field Trip for Indian Exploration Co.	Ardmore, OK	11/29 12/1/04	8	7 (88%)	100%
Springer Field Trip for Marathon Oil Co.	Ardmore, OK	12/9/04	10	9 (90%)	100%
SPE Ft Smith Lunch and Learn	*Ft Smith, AR*	*12/14/04*	33	33 (100%)	
Lunch & Learn: Stimulating Arbuckle Production in Kansas with New Technology (KS Geol. Society)	*Wichita, KS*	*1/12/05*	*45*	*40 (90% est)*	
Unconventional Gas Resources in Kansas	Wichita, KS	1/19/05	99	86 (87%)	60%
Maximize Rod String Life Through Proper Handling and Care (MWC)	Ardmore, OK	2/2/05	9	9 (100%)	100%
4th Annual Oklahoma Aggregates Assn. Mtg.	Oklahoma City, OK	2/8-9/05	201 wks 89 field	188 (94%) 85 (77%)	43% 43%
Maximize Rod String Life Through Proper Handling and Care (MWC)	Pawhuska, OK	2/9/05	9	9 (100%)	100%
Lunch and Learn: Hydraulic Fracture Design, Treatment & Application (AOGCC, SPE Ft. Smith)	*Fort Smith, AR*	*2/10/05*	*30*	*23 (77%)*	*0%*
Maximize Rod String Life Through Proper Handling and Care (MWC)	Oklahoma City, OK	2/16/05	31	31 (100%)	100%
Luncheon Presentation (SE Kansas Economic Development Commission): Coalbed Methane Production in Eastern Kansas	*Chanute, KS*	*2/18/05*	*17*	*17 (100% est)*	
Deep Gas Well Stimulation (Pinnacle Technologies)	Norman, OK	2/23/05	124	104 (84%)	48%
Maximize Rod String Life Through Proper Handling and Care (MWC)	Tulsa, OK	2/23/05	13	13 (100%)	100%
TORP Oil Recovery Conference	Wichita, KS	4/6-7/05	136	92 (68%)	64%

Chart-Type Gas Meters and How To Calculate Gas Production (MWC)	Tulsa, OK	4/12/05	34	34 (100% est)	
Chart-Type Gas Meters and How To Calculate Gas Production (MWC)	Oklahoma City, OK	4/13/05	73	73 (100% est)	
Polymer Gel (OGS)	Norman, OK	4/13/05	40	33 (83%)	70%
Chart-Type Gas Meters and How To Calculate Gas Production (MWC)	Ardmore, OK	4/20/05	20	20 (100%)	
CO_2 Flooding Potential in Kansas (KIOGA) Workshop Field Trip	Russell, KS	4/21/05	 95 77	 95 est 77 est	
Reading the Rocks from Wireline Logs (KGS)	Lawrence, KS	4/27/05	8	5 (63%)	37%
Cased Hole and Production Log Interpretation for Geologists (KGS)	Lawrence, KS	4/28/05	12	4 (33%)	67%
Morrow and Springer Strata in the Southern Midcontinent (OGS)	Oklahoma City, OK	5/10-11/05	237	214 (90%)	71%
Risks & Optimum Well Designs for Compacting Reservoirs (SPE Ft. Smith)	*Ft. Smith, AR*	*5/12/05*	*16*	*16 (100%)*	
Natural Gas Balancing, Current Issues and Known Problems as Affected by JOA (MWC)	Oklahoma City, OK	6/14/05	55	55 (100%)	
Natural Gas Balancing, Current Issues and Known Problems as Affected by JOA (MWC)	Tulsa, OK	6/15/05	47	47 (100%)	
Directional Drilling (SPE Ft. Smith)	*Ft. Smith, AR*	*6/29/05*	*17*	*17 (100%)*	
Horizontal Drilling with Case Studies in Osage County (Grand Resources)	Norman, OK	7/27/05	95	84 (88%)	60%
SPCC Rules and 2002 Revisions; Artificial Lift Downhole Technology	Smackover, AR	8/10/05	54	52 (96%)	65%
Simplified Online Automated Reporting (KIOGA)	*Wichita, KS*	*8/22/05*	*30*	*30 (100% est)*	
Maintaining and Repairing Casing Integrity (Great Bend API)	Great Bend, KS	9/13/05	65	55 (85%)	72%
Candidate Selection for Horizontal Drilling with Case Studies in Pennsylvanian Sandstones	Chanute, KS	9/15/05	32	27 (84%)	71%
Kansas Oil and Gas Information Available Online (EKOGA)	*Chanute, KS*	*9/16/05*	*50*	*50 (100% est)*	
Crash Course in Log Interpretation	Norman, OK	9/21/05	92	72 (78%)	49%
Workshop History: FY05 Attendance (41 events)			**2,327**	**2,103 (90%)**	
The Crash Course in Log Analysis, An Excel Spreadsheet Workshop	Lawrence, KS	10/6/05	11	8 (73%)	45%
Old Electric Logs, Interpretation and Analysis	Lawrence, KS	10/7/05	8	5 (62%)	38%
Booch Play (Okla. Geological Survey)	Norman, OK	12/1/05	56	44 (79%)	79%
Analyzing Mature Oil Reservoirs in Eastern Kansas for Additional Reserves	Iola, KS	12/8/05	20	15 (75%)	70%
Crash Course on Log Analysis	Lawrence, KS	3/2/06	7	7 (100%)	
Old Electric Logs: Interpretation & Analysis	Lawrence, KS	3/3/06	8	7 (88%)	
Coalbed Methane & Gas Shales (OGS)	Oklahoma City, OK	3/21/06	392	356 (91%)	58%
Horizontal Drilling w Case Studies in Pennsylvanian Sandstones (KU SPE Student Chapter, Grand Directions)	*Lawrence, KS*	*3/29/06*	*27*		
PfEFFER Pro and Web Tools	Wichita, KS	3/30/06	18	16 (89%)	
Maintenance and Repair of Casing Integrity (SPE Wichita)	Wichita, KS	4/11/06	61	40 (65%)	60%
Coiled Tubing Drilling & Reentry, Microhole Technology Development (KIOGA)	McPherson, KS	4/12/06	41	41 est. (100%)	
Independents' Day @ SPE/DOE IOR Sym. (N Mid)	Tulsa, OK	4/25/06	78	73 (94%)	
Fayetteville Gas Shale Play (AR Geological Survey)	Ft. Smith, AR	5/10/06	120	113 (94%)	53%
Caney Gas Shale Play (OGS)	Oklahoma City, OK	8/3/06	276	247 (89%)	70% est.

New Approaches and Economics of Gel Treatments to Increase Oil Production in Arbuckle Wells (presentation @ KIOGA annual meeting)	*Wichita, KS*	*8/21/06*	*58*	*58 (100%)*	
Midcontinent O&G Expo and Prospect Fair	Great Bend, KS	9/12/06	321	312 (97%)	
Analyzing Mature Oil Reservoirs in Eastern Kansas for Additional Reserves	Chanute, KS	9/14/06	26	19 (73%)	65%
Updating CBM Production in SE Kansas (presentation at EKOGA annual meeting)	*Chanute, KS*	*9/15/06*	*53*	*53 (100%)*	
Workshop History: FY06 Attendance (18 events)			**1,582**	**1,414 (89%)**	
Midcontinent CBM Symposium (OIPA, Midcontinent CBM Forum)	Tulsa, OK	10/22-24/06	249	235 (94% est)	
3-D Seismic (Oklahoma Geological Survey)	Norman, OK	11/1/06	120	106 (88%)	68%
Crash Course in Log Analysis (Kansas Geological Survey)	Lawrence, KS	11/16/06	34	30 (88% est)	
Log Analysis Using PfEFFER Software (Kansas Geological Survey)	Lawrence, KS	11/17/06	27	24 (89% est)	
Produced Water Issues and Including Casing Leak Prevention and Repairs	El Dorado, AR	2/7/07	28	25 (89%)	64%
Crash Course in Log Analysis (Kansas Geological Survey)	Lawrence, KS	3/8/07	46	41 (89% est)	
Reading the Rocks from Wireline Logs (Kansas Geological Survey)	Lawrence, KS	3/9/07	55	50 (91% est)	
17th Annual Oil Recovery Conference (Tertiary Oil Recovery Project)	Wichita, KS	4/4-5/07	96	86 (90% est)	
Producers' Forum (EKOGA)	Chanute, KS	9/13/07	30 est	25 (100%)	
Workshop History: FY07 Attendance (9 events)			**685**	**627 (92%)**	
Crash Course in Log Analysis (Kansas Geological Survey)	Lawrence, KS	10/11/07	17	17 (100%)	
PfEFFER Log Analysis, Overview and Examples (Kansas Geological Survey)	Lawrence, KS	10/12/07	17	17 (100%)	
Electronic Production Data Gathering & Remote Surveillance	Wichita, KS	2/20/08	35	35 (100%)	
Gel Polymer Water Shut-Off Treatments in Kansas	Wichita, KS	4/1/08	38	36 (95%)	
CO_2 Applications for Enhanced Oil Recovery and Sequestration	Wichita, KS	5/6/08	35	35 (100%)	
Fundamentals of Well Completion and Stimulation	Wichita, KS	9/4/08	114	100 (88%)	
Workshop History: FY08 Attendance (6 events)			**256**	**240 (94%)**	
Wellbore and Reservoir Diagnostics and Problem Remediation	Wichita, KS	11/15/08	88	85 est. (97%)	
Evaluating O&G Reserves and Economics in an Uncertain Time	Wichita, KS	2/5/09	65	59 (90% est.)	
Pumpers' Workshop	Russell, KS	2/26/09	46	41 (90% est.)	
TORP Oil Recovery Conference	Wichita, KS	4/1-2/09	88	79 (90% est.)	
Applied Reservoir Geology for Engineers (SPE Midcontinent Section)	Tulsa, OK	4/21/09	34	32 (94%)	
Keys to Complex Well Economic Success	Oklahoma City, OK	5/19/09	27	23 (85%)	
Water/Gas Shutoff and Conformance Control – Knowing What To Do, When	Tulsa, OK	6/30/09	22	22 (100%)	
Workshop History: FY09 Attendance (7 events)			**370**	**341 (92%)**	

PTTC Rocky Mountain Region
(Rocky Mountain & Northwest New Mexico Portion of Southwest Region Merged Into Rocky Mountain Region Effective Start of FY07)

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
GeoPlus PETRA Basic Training	Golden, CO	10/15-16/03	18	18 (100%)	89%
PETRA "extra credit" Training	Golden, CO	10/17/03	12	12 (100%)	100%
Simulation Users Group Luncheon: Exodus	*Denver, CO*	*10/23/03*	*6*	*6 (100%)*	*100%*
Coalbed Methane Conference & Field Trip (SPE)	Snowbird, UT	10/24-25/03	116	105 (91%)	11%
Brushy Canyon FEE Tool	Albuquerque, NM	10/28-29/03	18	4 (22%)	
GeoGraphix Training, Overview and Refresher	Golden, CO	11/14/03	10	9 (90%)	70%
CrossLog Software Training	Golden, CO	11/19/03	6	5 (83%)	67%
Simulation Users Group Luncheon: Vertex 1000	*Denver, CO*	*11/20/03*	*10*	*10 (100%)*	*90%*
Low Cost Software and Data Fair	on-line	Jan & Feb			
USGS Free Data Resources for GIS Applications	Golden, CO	1/14/04	19	17 (89%)	90%
CorelDraw Graphics for Cross Sections	Denver, CO	1/16/04	10	10 (100%)	70%
Simulation Users Group Luncheon: IFLOW Frontier	*Denver, CO*	*1/29/04*	*13*	*11 (85%)*	*92%*
Well File 5 Data, Mapping, Cross Sections, & More	Golden, CO	2/11/04	5	2 (40%)	40%
Surfer 8 Contouring, Gridding and Surface Mapping	Golden, CO	2/17/04	11	6 (55%)	72%
Jlog Petrophysics, Wireline Log Analysis	Golden, CO	2/19/04	6	3 (50%)	50%
DOE Neuro3 Neural Network Software	Golden, CO	2/25/04	9	6 (67%)	89%
DOE Boast Black Oil Simulator	Golden, CO	2/25/04	14	10 (71%)	93%
Gas Well Deliquification (ALRDC, SWPSC, others)	Denver, CO	3/1-3/04	277	265 (96%)	85%
GeoPlus PETRA Basic Training	Golden, CO	3/9-10/04	19	15 (79%)	79%
SMT Kingdom: Data Importing, 2d/3d Pak Basics	Golden, CO	3/23/04	21	20 (95%)	91%
SMT Kingdom Suite, 2d/3d Pak Interpretation II	Golden, CO	3/24/04	17	16 (94%)	100%
Simulation Users Group—Using History Match "Miss-Matches" to Adjust Reservoir Description	*Denver, CO*	*3/24/04*	*13*	*13 (100%)*	*92%*
Produced Water Management & Issues	Farmington, NM	4/1/04	51	41 (80%)	37%
SMT Kingdom Suite EarthPAK	Golden, CO	4/6/04	7	7 (100%)	71%
SMT Kingdom Suite VuPAK	Golden, CO	4/7/04	12	12 (100%)	83%
Simulation Users Group: Streamline-Based Simul.	*Denver, CO*	*4/28/04*	*13*	*13 (100%)*	*100%*
Oil SPCC Plan Development for Producers	Minot, ND	5/2/04	12	12 (100%)	8%
Simulation Users Group: CO2 and CBM Modeling	*Golden, CO*	*5/26/04*	*20*	*20 (100%)*	*90%*
Hydraulic Fracturing: Measurement, Characterization and Analysis (SPE Casper)	Casper, WY	5/27/04	32	24 (75%)	75%
GeoPlus PETRA Training for Encana Summer Interns	Golden, CO	6/1-2/04	11	11 (100%)	9%
GeoGraphix Overview and Refresher	Golden, CO	6/2/04	11	11 (100%)	82%
GeoPlus PETRA Basic Training	Golden, CO	6/3-4/04	19	19 (100%)	89%
Futures in Energy Student Internship (on campus)	Golden, CO	6/13-18/04	13 students, 20 teachers, 8 internships		
Pit Rules and Guidelines Public Forums (NM OCD)	Santa Fe, NM	6/21/04	11	10 (95% est.)	35% est.
Improving Electrical Efficiency in E&P Operations (Energy & Env. Research Center, Univ. of ND)	Bismarck, ND	6/22/04	25	14 (56%)	12%
Pit Rules and Guidelines Public Forums (NM OCD)	Farmington, NM	6/24/04	58	55 (95% est.)	35% est.

4 Short Courses @ AAPG-RMS and COGA mtg: >> Identifying and Appraising Coalgas Reservoirs >>Horizontal Technology (Canceled) >> Gas Markets and Pricing Factors >> Influence of Depositional Environments on Coal Stratigraphy (Canceled)	 Denver, CO Denver, CO Denver, CO Rock Springs, WY	 8/8/04 8/8/04 8/8/04 8/5-8/04	 17 19	 17 (100%) 19 (100%)	 47% 26%
Internet Data Resources: Colorado, New Mexico, Utah (Rocky Mountain)	Farmington, NM	9/9/04	34	30 (93%)	35%
Internet Data Resources: CO, NM, UT (Southwest)	Farmington, NM	9/9/04	To be reported by Southwest		
GeoPlus PETRA Intermediate Mapping	Golden, CO	9/16/04	20	20 (100%)	90%
Simulation Users Group	*Denver, CO*	*9/22/04*	*15*	*15 (100%)*	*87%*
Bakken Core Workshop (RMAG)	Denver, CO	9/24/04	70	70 (100%)	89%
Workshop History: FY04 Attendance (40 events +1 Futures)			**1,087**	**983 (90%)**	
What's New in Logging Measurements & Techniques	Casper, WY	10/6/04	28	16 (57%)	90%
GeoPlus PETRA Basic Training for Beginners	Golden, CO	10/7-8/04	22	22 (100%)	86%
Simulation Users Group: Fekete RTA (Dave Anderson, Fekete)	*Denver, CO*	*10/19/04*	*10*	*10 (100%)*	*100%*
GeoPlus PETRA Intermediate Cross Section	Golden, CO	10/21/04	18	18 (100%)	95%
GeoPlus PETRA Intermediate Engineering Tools	Golden, CO	10/22/04	19	19 (100%)	100%
Hydrothermal Dolomite Conference (RMAG)	Golden, CO	11/15/04	117	92 (79%)	90%
Simulation Users Group: CBM Simulation ECLIPSE	*Denver, CO*	*11/18/04*	*11*	*11 (100%)*	*100%*
Simulation Users Group: Williston Basin Case Study; Merging Modern Reservoir Characterization with Traditional Reservoir Engineering (Forest Oil)	*Denver, CO*	*1/24/05*	*13*	*13 (100%)*	*100%*
Hydraulic Fracturing	Vernal, UT	1/28/05	20	15 (75%)	50%
GeoGraphix Overview and Refresher	Golden, CO	1/28/05	22	21 (95%)	86%
GeoPlus PETRA, Intermediate Mapping & Display	Golden, CO	2/3/05	22	20 (91%)	100%
GeoPlus PETRA, Basics	Golden, CO	2/10-11/05	22	21 (95%)	64%
GeoPlus PETRA, Intermediate Cross Section	Golden, CO	2/17/05	21	21 (100%)	100%
Electric Submersible Pumps Plus Well Stimulation and Corrosion Control (SPE Casper)	Casper, WY	2/17/05	24	5 (21%)	92%
Simulation Users Group: What One Needs to Know to Simulate a Polymer Flood or In-Depth Polymer Crosslink Gel Process (Jim Mack, TIORCO)	*Denver, CO*	*2/23/05*	*13*	*13 (100%)*	*100%*
Core wkshp: Valley-Fill Sandstones (USGS)	Denver, CO	2/24/05	60	58 (97%)	93%
GeoPlus PETRA, Intermediate Engineering Tools	Golden, CO	2/25/05	20	20 (100%)	100%
2005 Gas Well Deliquification (Texas Tech Univ., ALRDC, Southwest Petroleum Short Course)	Denver, CO	2/28-3/2/05	390	351 (90% est.)	74%
Simulation Users Group: Probabilistic Modeling Using a New Boast 98 Module (Reeves, ARI)	*Denver, CO*	*3/17/05*	*15*	*100 (100%)*	*100%*
Data Gathering Techniques and Interfaced Production Accounting Software (Texas)	Farmington, NM	3/17/05	19	15 (79%)	25%
Introduction to Mining the Internet: Free GIS Data/Low Cost Software for O&G Professionals	Golden, CO	3/31/05	40	38	(95%)
90%Subsurface Fluid Pressures & Their Relation to O&G Generation, Migration and Accumulation	Denver, CO	4/22/05	29	29 (100%)	83%
Simulation Users Group: Production History/Type Curve Matching for Fractured Tight Gas Reservoirs	*Denver, CO*	*4/27/05*	*19*	*19 (100%)*	*90%*
Geology of Horizontal Reservoirs; Past, Present and Future (A Core Workshop) (RMAG, USGS)	Denver, CO	5/13/05	32	30 (94%)	88%
SMT Kingdom Suite Data Loading	Golden, CO	5/19/05	9	9 (100%)	78%

Gas & Oil Developments Utah: 2005 (SPE Salt Lake)	Salt Lake City, UT	5/20/05	150	120 (80% est)	65% est.
SMT Kingdom Suite 2d/3d PAK Interpretation Basics	Golden, CO	5/23/05	14	14 (100%)	86%
SMT Kingdom Suite 2d/3d PAK Interpretation II	Golden, CO	5/24/05	8	8 (100%)	75%
SMT Kingdom Suite VuPAK	Golden, CO	5/25/05	9	9 (100%)	78%
GeoGraphix Overview and Refresher	Golden, CO	5/26/05	20	18 (90%)	0%
Futures in Energy -- Colorado	Golden, CO	6/13-17/05	20	Not Applicable	
Hydraulic Fracturing	Farmington, NM	6/21/05	21	20 (95%)	25%
Futures in Energy -- Wyoming	Pinedale, WY	6/27 - 7/105	7	Not Applicable	
Coalbed Methane Symposium (RMAG)	Denver, CO	6/30/05	235	225 (96% est.)	85% est.
Gas in Low Permeability Reservoirs (RMAG)	Denver, CO	8/29/05	387	364 (94%)	90%
Introduction to Mining the Internet: Free GIS Data and Low Cost Software (Texas)	Farmington, NM	9/15/05	23	22 (95%)	86%
Short Courses @ AAPG Rocky Mountain Section (1) Internet – Free GIS Data & Low Cost Software (2) Bakken Play Essentials	Jackson Hole, WY	9/24/05	 19 60	 18 (95%) 57 (95%)	 84% 83%
GeoGraphix Overview and Refresher	Golden, CO	9/30/05	11	10 (1%)	82%
Workshop History: FY05 Attendance (37 events + 2 Futures)			**1,972**	**1,786 (91%)**	
Coalbed Methane Conference (SDSM&T)	Rapid City, SD	10/20-21/05	97	73 (75%)	20%
Simulation Users Group: SMT SURE Simulator	*Denver, CO*	*10/27/05*	*11*	*11 (100%)*	*91%*
Source Rocks 101: What the Exploration Geologist, Geophysicist and Production Engineer Should Know	Golden, CO	10/28/05	20	18 (90%)	90%
Successfully Awakening Mature Fields; A Process for Reversing Production Decline	Denver, CO	11/4/05	14	14 (100%)	93%
Core workshop: Pore System Variations in Some Major Carbonate Reservoirs in the Rockies (USGS)	Denver, CO	11/17/05	19	18 (95%)	95%
Simulation Users Group: Roxar	*Denver, CO*	*11/30/05*	*12*	*12 (100%)*	*92%*
H_2S Issues	Farmington, NM	12/7/05	41	39 (95%)	18%
How To Use GIS/GPS to Map Oilfield Assets	Golden, CO	2/2/06	21	10 (48%)	48%
San Juan Database Kickoff Meeting	Farmington, NM	2/16/06	20	18 (90%)	50%
GeoGraphix: Basic Training, Overview & Refresher	Golden, CO	3/14/06	13	7 (54%)	39%
Basic Training for Beginning MICA Users	Golden, CO	4/7/06	11	11 (100%)	
Low Cost GIS Data and Software (AAPG Short Course Presentation) AAPG EMD	*Houston, TX*	*4/8/06*	*38*	*38 (100%)*	
Intermediate Training for MICA Users	Golden, CO	4/14/06	13	13 (100%)	
Material Balance and Modeling (Core Labs)	Denver, CO	5/3/06	32	30 (94%)	60%
Microhole Drilling with Coiled Tubing (SPE Denver)	Denver, CO	5/19/06	35	31 (89%)	35%
Presentation, IOGCC about "Core Locator System"	*Billings, MT*	*5/22/06*	*40*	*30 est. (75%)*	
Formation Damage and Underbalanced Drilling	Denver, CO	6/2/06	27	27 (100%)	25%
Source Rocks 101: What The Exploration Geologist, And Production Engineer Should Know About Petroleum Source Rocks (RMAG, SEPM Rocky Mtn)	Billings, MT	6/10/06	22	22 (100%)	
Futures in Energy	*Golden, CO*	*6/26-30/06*	*46*	*0 (0%)*	
Informed Petroleum Professional; O&G Pricing, Consumption, Production Issues; (session @ RMAG 2006 Rocky Mountain Natural Gas Conference)	Denver, CO	8/9/06	50	50 (100%)	
GeoGraphix Overview & Refresher Training	Golden, CO	9/22/06	16	16 (100%)	
Shale Gas, Exploration to Production (RMAG)	Denver, CO	9/25/06	450	405 (90% est.)	
Workshop History: FY06 Attendance (21 events + 1 Futures)			**1,002**	**893 (89%)**	

2006 Rocky Mountain Unconventional Gas Conference (South Dakota School of Mines)	Rapid City, SD	10/11-13/06	123	123 (100%)	
Presentation about "Futures in Energy" at IOGCC	*Austin, TX*	*10/16/06*	*50*	*25 (50%)*	
Hydraulic Fracturing; Measurement, Characterization and Analysis	Denver, CO	11/7/06	36	36 (100%)	10%
Implementing GeoTechnologies for Mining and Petroleum Industries (Mesa State College)	Grand Junction, CO	1/16-18/07	14	14 (100%)	
Sequence Stratigraphy, Principles and Applications	Billings, MT	2/22-23/07	34	34 (100%)	
Hydraulic Fracturing; Measurement, Characterization and Analysis	Billings, MT	3/13/07	29	29 (100%)	10%
GIS and GPS for Earth Scientists	Golden, CO	3/20/07	20	18 (90%)	
Futures in Energy – Student Training & Internship	Pinedale, WY	6/11-15/07	5	2 students, 3 teachers	
Futures in Energy – Student Training & Internship	Golden, CO	6/18-22/07	33	13 students, 20 teachers	
Structural Concepts and Applications in Rocky Mountain Hydrocarbon Plays (RMAG)	Denver, CO	9/13-14/07	209	209 (100%)	
Workshop History: FY07 Attendance (8 events + 2 Futures)			**515**	**488 (95%)**	
Sequence Stratigraphy; Principles and Applications – Golden, CO.	Golden, CO	10/24-25/07	23	23 (100%)	70%
GeoGraphix Training, An Overview and Refresher Course	Golden, CO	11/16/07	20	20 (100%)	90%
GIS and GPS for Earth Scientists	Denver, CO	12/13/07	20	20 (100%)	95%
Putting It All Together, Optimizing Frac Design	Golden, CO	1/23/08	30	30 (100%)	Not Avail.
Petra Basics	Golden, CO	2/29/08	20	20 (100%)	Not Avail.
Seismic Imaging of Carbonate Reservoirs & Seals, Exploration and Production Applications	Golden, CO	3/13-14/08	26	26 (100%)	Not Avail.
Crash Course in Log Analysis	Golden, CO	4/4/08	62	62 (100%)	100%
GeoGraphix Training, An Overview & Refresher	Golden, CO	4/11/08	16	16 (100%)	100%
Applied Hydrodynamics	Billings, MT	5/1-2/08	21	21 (100%)	
Petra Basics	Golden, CO	5/15/08	20	20 (100%)	
Successfully Awakening Mature Oil Fields, A Process for Reversing Field Production Decline	Golden, CO	5/20/08	17	17 (100%)	
Depositional Environments, Diagenesis, and Hydrothermal Alteration of the Mississippian Leadville Limestone Reservoir, Paradox Basin, Utah: A Core Workshop	Denver, CO	5/23/08	39	39 (100%)	
Futures in Energy	Pinedale, WY	6/9-13/08	2 students, 4 teachers		
Futures in Energy	Golden, CO	6/16-20/08	13 students, 10 teachers		
Rocky Mountain Section AAPG Bakken core workshop Bakken core workshop Completions & Stimulations for Geologists	 Denver, CO Denver, CO Golden, CO	 7/7/08 7/8/08 7/12/08	 41 42 63	 37 (90% est.) 38 (90% est.) 57 (90% est.)	
Petra Basics	Golden, CO	7/15/08	20	20 (100%)	
Hydraulic Fracturing, Measurement, Characterization & Analysis (Minot State Univ.)	Minot, ND	8/11/08	20	20 (100%)	
Paradox Basin Field Trip (RMAG)	Southeast UT	9/17-19/08	28	25 (90% est.)	
Rocky Mountain Symposium: "Dusters" Lessons Learned and Opportunities Created (RMAG)	Denver, CO	9/22-23/08	200+	180 (90% est.)	
Risk Management (RMAG)	Denver, CO	9/23/08	25	23 (90% est.)	
Workshop History: FY08 Attendance (20 events + 2 Futures)			**753**	**714 (95%)**	
Uranium Geology & Geochemistry	Golden, CO	10/20-21/08	32	32 (100%)	
GeoGraphix, An Overview & Refresher	Golden, CO	11/7/08	10	10 (100%)	

Presentation @ Great Plains Energy Expo (Dave Burnett, Texas A&M – Env. Friendly Oil & Gas)	Bismarck, ND	11/10-11/08	300	A presentation – not counted as a workshop.	
Carbonate Diagenesis, Dolomitization and Porosity Evolution	Golden, CO	11/11/08	33	33 (100%)	
GIS and GPS for Earth Scientists	Golden, CO	11/21/08	20	20 (100%)	
Paradox Basin Core Workshop	Denver, CO	12/4/08	47	47 (100%)	
Petra Basics	Golden, CO	12/5/08	20	20 (100%)	
Basic Openhole Log Interpretation	Golden, CO	1/21-22/09	52	52 (100%)	
Hydraulic Fracturing: Measurement, Characterization and Analysis	Golden, CO	2/16/09	19	19 (100%)	
Source Rocks 101: What the Exploration Geologist, Geophysicist and Production Engineer Should Know About Source Rocks	Golden, CO	2/23/09	32	32 (100%)	
Uranium Geology & Geochemistry	Golden, CO	3/9-10/09	16	16 (100%)	
Petroleum Geology for Non-Geologists	Golden, CO	3/12-13/09	38	38 (100%)	
Petra Basics	Golden, CO	4/6/09	20	20 (100%)	
Completions and Stimulations for Geologists (Minot State University)	Minot, ND	4/22/09	14	14 (100%)	
GeoGraphix Training, An Overview & Refresher	Golden, CO	5/15/09	15	15 (100%)	
Keys to Complex Well Economic Success	Denver, CO	5/21/09	22	22 (100%)	
Descriptive Lithology; Analysis of Cuttings and Cores (AAPG)	Golden, CO	6/11/09	28	28 (100%)	
Futures in Energy Student Training/Internship	Golden, CO	6/15-20/09	17 students, 20 teachers		
Petra Basics	Golden, CO	7/8/09	20	15 (75%)	
Reservoir Fluids and Core Analyses (Core Labs)	Denver, CO	7/22/09	26	26 (100%)	
Unconv. Gas, Gas Shales and CBM (RMAG)	Denver, CO	9/14/09	350	350 (100%)	
Coalbed Methane	Golden, CO	9/15/09	24	24 (100%)	
Reservoir Engineering for Petroleum Geologists	Golden, CO	9/23-24/09	23	23 (100%)	
Workshop History: FY09 Attendance (21 events + 1 Futures)			**861**	**856 (99%)**	

PTTC Texas/SE New Mexico Region
(Texas & Southeast New Mexico Portion of Southwest Region Merged Into Texas/SE New Mexico Region Effective Start of FY07)

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
Lunch & learn: Low-Cost Rod Pump Control (eP Solutions)	*Midland, TX*	*10/16/03*	*26*	*26 (100%)*	*35%*
Lunch & learn: Low-Cost Rod Pump Control (eP Solutions)	*Houston, TX*	*10/21/03*	*19*	*16 (84%)*	*13%*
Electronic Resources for NM Producers	Roswell, NM	11/13/03	21	18 (86%)	30%
2003 Annual CO_2 Conference (CEED, others)	Midland, TX	12/9-12/03	287	270 (93%)	
PTTC/BEG Permian Basin (Topical Work Group)	Midland, TX	1/15/04	60	57 (95%)	32%
Soil Remediation (Central Gulf)	Tyler, TX	1/21/04	42	39 (93%)	7%
Lunch & learn: Low-Cost Rod Pump Control (eP Solutions)	*Farmers Branch*	*3/18/04*	12	12 (100%)	8%
Lunch & learn: Low-Cost and Efficient Digital Collection of Production Data Using Hand-Held Units (IHS Energy)	*Midland, TX*	*3/31/04*	12	12 (100%)	42%
Hand-held/Laptop Production Data Capture (PPROA)	Amarillo, TX	5/18/04	12	12 (100%)	100%
Operators Working in Offshore Texas State Waters Royalty Leases (STARR, Texas BEG)	Houston, TX	6/15/04	21	20 (95%)	10%
Soil Remediation (Texas)	Hobbs, NM	6/16/04	39	29 (74%)	7%
Pit Rules and Guidelines Public Forums (NM OCD)	Hobbs, NM	6/22/04	50	48 (95% est)	35% est.
Barnett Shale Symposium (Ellison Miles)	Farmers Branch	6/22-23/04	200	190 (95%)	
Pit Rules and Guidelines Public Forums (NM OCD)	Artesia, NM	6/23/04	40	38 (95% est.)	35% est.
Produced Water & Associated Issues (TX Alliance)	Tyler, TX	7/18/04	25	25 (100%)	
Reservoir Fluids (Core Labs)	Houston, TX	7/28/04	44	40 (91%)	32%
Polymer and Polymer-Gel Water Shutoff Trtmnts: What It Takes To Be Successful & Field Applcns	Houston, TX	8/25/04	34	30 (88%)	7%
Workshop History: FY04 Attendance (17 events)			**944**	**882 (90%)**	
Tech Sessions @ Permian Basin Oil Show (Kiker facilitated, involved in Program Committee)	Midland, TX	10/19-20/04	230	230 (100%)	
Business Tech Session @ PBPA	Midland, TX	10/28/04	41	41 (100%)	100%
"Emerging Technologies" Workshop @ IPAA Annual Meeting (Headquarters)	Austin, TX	10/28/04	88	88 (100%)	
Unconventional Gas Reservoirs Symp.	Farmers Branch	11/3/04	65	65 (100%)	
Produced Water Seminar (Texas Alliance)	Wichita Falls, TX	11/4/04	35	35 (100%)	
Essentials of Subsurface Mapping (S TX Geol. Soc.)	San Antonio, TX	11/10/04	32	32 (100%)	50%
Permian Basin Initiative Workgroup	Midland, TX	11/30/04	38	38 (100%)	40%
Devonian FEE Tool Training (PRRC)	Roswell, NM	12/1/04	10	8 (80%)	100%
Permian Basin Initiative Workgroup	Houston, TX	12/7/04	23	23 (100%)	26%
Deep Gas Well Stimulation (Pinnacle Technologies)	Houston, TX	12/8/04	82	78 (95%)	17%
2004 Annual CO_2 Conference (CEED & others)	Midland, TX	12/9-10/04	245	215 (82%)	
Stranded Gas & Power Cost Reduction (Southwest)	Midland, TX	12/15/04	13	13 (100%)	31%
Data Gathering Techniques and Interfaced Production Accounting Software (Southwest)	Midland, TX	3/1/05	16	16 (100%)	5%
Controlling Sand Production (Central Gulf)	Houston, TX	3/2/05	31	27 (87%)	26%
Rocks, Pores & Capillary Pressure (EMGTI)	Farmers Branch	3/3-4/05	35	35 (100%)	
Kiker presentation @ Illinois O&G Association	*Evansville, IN*	*3/4/05*	*Reported by Midwest*		

Data Gathering Techniques and Interfaced Production Accounting Software (Southwest)	Farmington, NM	3/17/05	Reported by Southwest		
Kiker presentation @ Digital Energy Conference	*Houston, TX*	*3/23/05*	*200*	*200 (100%)*	
Kiker presentations @ Southwestern Petroleum Short Course, Wellbore Management and Produced Water Management (4 presentations)	*Lubbock, TX*	*4/19-20/05*	*87*	87 (100%)	20%
Petroleum Geoscience; Basics of Petroleum Generation, Migration, Trapping (EMGTI)	Farmers Branch, TX	5/3-4/05	35	31 (89%) est.	
Horizontal Drilling (Texas)	Midland, TX	5/12/05	84	81 (96%)	15%
Horizontal Drilling (Southwest)	Midland, TX	5/12/05	Reported by Southwest		
Barnett Shale III Symposium (EMGTI)	Farmers Branch	6/8-9/05	200	180 (90%) est.	
EPA's Natural Gas STAR & Vapor Recovery/Wellhead Compression	Corpus Christi, TX	6/16/05	15	14 (93%)	0%
Material Balance, Modeling and Simulation, Reservoir Engineering Tools (Core Labs, w C. Gulf)	Houston, TX	6/29/05	70	68 (97%)	30%
Introduction to Mining the Internet: Free GIS Data and Low Cost Software (Southwest)	Midland, TX	9/13/05	23	23 (100%)	37%
Introduction to Mining the Internet: Free GIS Data and Low Cost Software (Southwest)	Farmington, NM	9/15/05	Reported by Southwest		
Stranded Gas, Options for Realizing Value (Texas Alliance)	Dallas, TX	9/20/05	30	28 (93%)	6%
Geological, Petrophysical and Engineering Aspects of Reserves Writedowns (Ellison Miles)	Farmers Branch	9/20-22/05			
Horizontal Well Technologies and CBM Applications (Central Gulf)	Houston, TX	9/22/05	Canceled due to Hurricane Rita		
Workshop History: FY05 Attendance (25 events)			**1,768**	**1,696 (96%)**	
New Technology Enabling New Plays (SIPES, N. Texas Energy Council)	Farmers Branch, TX	10/18/05	70	70 (100%)	13%
Tech Session @ PBPA annual meeting	Midland, TX	10/20/05	56	56 (100%)	
Symposium on Improved Profits Through Emissions Reductions (Texas A&M Corpus Christi)	Corpus Christi, TX	11/1/05	40	32 (80%)	3%
Barnett Shale Symp, (Midland College, SPE PB)	Midland, TX	11/1/05	210	210 (100%)	
Fundamentals of Seismic Interpretation (EMGI)	Farmers Branch	11/1-2/05	NA	NA	
11th Annual CO2 Conference (Southwest, Others)	Midland, TX	12/8-9/05	414	414 (100%)	
Reserve-Growth Potential from CO2-Enhanced Oil Recovery Along the Gulf Coast (BEG)	Houston, TX	12/13/05	35	32 (91%)	38%
Core workshop: Tight Gas Sands, Cotton Valley Formation of East Texas (Matador Resources)	Austin, TX	12/14-15/05	17	17 (100%)	
Deep Shelf Gas Play of Texas (BEG)	Houston, TX	12/15/05	18	16 (89%)	44%
Southwest Regional Partnership on Carbon Sequestration; Kickoff Meetings for Field Pilots	Socorro, NM	12/15-16/05	43	8 (19%)	5%
Core workshop: Tight Gas Sands, Cotton Valley Formation of East Texas (Matador Resources)	Austin, TX	1/17-18/06	34	34 (100%)	18%
Horizontal Well Technologies & CBM (C Gulf)	Houston, TX	2/8/06	43	40 (93%)	27%
Core workshop: Tight Gas Sands, Cotton Valley Formation of East Texas (Matador Resources)	Austin, TX	3/7-8/06	28	28 (100%)	7%
Permian Basin Hydraulic Fracturing (Southwest)	Midland, TX	3/30/06	80	78 (98%)	29%
Producer Technology Transfer Workshop (EPA Natural Gas STAR, Devon)	Fort Worth, TX	6/6/06	17	17 (100%)	
Producer Technology Transfer Workshop (EPA Natural Gas STAR, Oxy)	Midland, TX	6/8/06	39	39 (100%)	
Hydraulic Fracturing (Texas Alliance)	Fort Worth, TX	7/11/06	35	35 (100%)	18%
Hydraulic Fracturing (Texas Alliance)	Tyler, TX	7/12/06	67	66 (99%)	23%
Designing and Forecasting Waterfloods Using Reservoir Grail (Grail Quest)	Midland, TX	8/01/06 8/02/06	25 7	25 (100%) 7 (100%)	
Explosives Safety (Core Labs)	Houston, TX	8/17/06	13	13 (100%)	15%

Kiker Presentation @ Canadian CO2 Conference	*Calgary, Canada*	*9/13/06*	*67*	*67 (100%)*	
Tech Speaker @ Texas Alliance meeting	*Abilene, TX*	*9/26/06*	*52*	*52 (100%)*	
Workshop History: FY06 Attendance (23 events)			**1,410**	**1,356 (96%)**	
Tech Session @ PBPA Annual Meeting	Midland, TX	10/12/06	60	60 (100%)	90%
Barnett Shale (Texas BEG)	Midland, TX	11/8/06	90	90 (100%)	18%
Barnett Shale (Texas BEG)	Houston, TX	11/14/06	89	87 (98%)	13%
2006 CO_2 Conference & Carbon Management	Midland/ Houston	12/4-8/06	409	389 (95% est)	
Hydraulic Fracturing Technology and Case Studies, Tight Gas Sands and Shales (Texas Alliance, South Texas Geological Society)	San Antonio, TX	2/23/07	53	53 (100%)	25%
Designing and Forecasting Waterfloods Using "Reservoir Grail"	Austin, TX	3/27/07	24	24 (100%)	17%
Tech Session @ Texas Alliance Annual Meeting (CO_2 management & low pressure gas resources)	Wichita Falls, TX	4/25/07	20	20 (100%)	
Workshop History: FY07 Attendance (7 events)			**745**	**723 (97%)**	
Production Data Gathering and Remote Surveillance (Midland College)	Midland, TX	10/17/07	19	19 (100%)	
Pilot Study of the East Texas Field; Geology, Engineering and Potential Future Exploitation	Kilgore, TX	10/30/07	40	40 (100%)	
Designing and Forecasting Waterfloods Using Reservoir Grail; The Best Place To Find Oil Is In The Oil Fields	Farmers Branch, TX	11/28/07	7	7 (100%)	
Technologies for Developing Naturally Fractured Reservoirs	Houston, TX	2/26/08	44	44 (100%)	
How to Start/Fix/Manage A Small Waterflood	Midland, TX	5/22/08	49	49 (100%)	
Workshop History: FY08 Attendance (5 events)			**159**	**159 (100%)**	
Sequence Stratigraphy and Depositional Systems of East Texas Field, A Core Workshop (Bureau of Economic Geology, UT Austin)	Houston, TX	11/18/08	50	50 (100% est)	
Questions, Answers and Challenges in Mudrock Systems Research: Technologies and Applications for Shale Reservoir Successions (Bureau of Economic Geology, UT Austin)	Houston, TX	11/20/08	103	103 (100% est.)	
Completions and Stimulations for Geologists (East Texas Geological Society)	Tyler, TX	3/4/09	49	49 (100% est.)	
How To Start/Fix/Manage a Small Waterflood (Texas Alliance)	Farmers Branch, TX	3/24/09	84	84 (100% est.)	
Source Rocks 101	Houston, TX	7/28/09	28	28 (100% est.)	
Completions & Stimulations for Geologists (South Texas Geological Society)	San Antonio, TX	8/6/09	38	38 (100% est.)	
How To Start/Fix/Manage a Small Waterflood	Houston, TX	8/19/09	14	14 (100% est.)	
Log Analysis of Shaly Sands (East Texas Geological Society)	Tyler, TX	9/17/09	43	42 (98% est.)	
Workshop History: FY09 Attendance (8 events)			**411**	**410 (99%)**	

PTTC West Coast Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
Economics of Oilfield Automation	Valencia, CA	10/30/03	41	34 (82%)	91%
Technology and Economics of Horizontal and Multilateral Wells	Valencia, CA	11/20/03	56	39 (70%)	87%
Economic Optimization in Marginal Fields—Anniversary Forum w Tech Transfer Awards	Los Angeles, CA	12/18/03	38	32 (84%)	88%
A Diatomite Workshop	Valencia, CA	1/29/04	93	71 (76%)	97%
CEC-PTTC PUMP Water Control Workshop	Los Angeles, CA	2/12/04	59	47 (80%)	83%
Fracturing Stimulation for California Oilfields	Valencia, CA	2/26/04	67	45 (67%)	91%
Short Course: "Geologic and Engineering Analysis for Coalbed Methane Resource Assessment and Development" at Alaska 2004 Unconventional Gas	Anchorage, AK	3/9/04	39	30 est (77%)	
Facilities Design, Rebuilding and Repairing	Valencia, CA	4/22/04	58	30 (52%)	90%
Case Studies of Power Consumption Reduction in California Oilfields (Global Power Systems)	Los Angeles, CA	5/27/04	46	36 (78%)	92%
COMET Student Internship (USC, Others)	Los Angeles, CA	6/20-25/04	15 students, 2 teachers, 3 internships		
Role of Faults in California Oilfields, workshop	Valencia, CA	8/18/04	57	30 (53%)	93%
Role of Faults in California Oilfields, field trip	Valencia, CA	8/19/04	41	31 (76%)	90%
Revitalizing California Mature Oilfields; Incentives, Opportunities and Challenges	Valencia, CA	9/23/04	49	34 (69%)	97%
Workshop History: FY04 Attendance (12 events)			**644**	**459 (71%)**	
Coiled Tubing Application and Operations	Valencia, CA	10/21/04	34	19 (56%)	89%
Tunnel Vision Management of Mature Oilfields (SPE Los Angeles Basin)	*Los Angeles, CA*	*11/16/04*	*60*	*50 (83%)*	
Waterflood Enhancement and Management	Los Angeles, CA	12/3/04	47	32 (68%)	84%
Application of Innovative and New Technologies in Reservoir Characterization	Valencia, CA	1/27/05	51	38 (75%)	97%
Modern Completion Practices	Valencia, CA	2/17/05	42	26 (62%)	88%
SPE Los Angeles (50th Anniversary Presentation: Metamorphoses of Oilfield Technologies	*Long Beach, CA*	*3/9/05*	*150*	105 (70% est)	
Independents' Day @ SPE Western Regional Mtg	Irvine, CA	3/31/05	24	17 (70% est)	
Gas Field Technology	Sacramento, CA	4/28/05	26	18 (69%)	89%
Water Control for Southern California Oil Wells(Global Energy Partners LLC), a roundtable discussion	*Los Angeles, CA*	*6/10/05*	16	11 (69%)	82%
COMET Student Training/Internship	Los Angeles, CA	6/26 7/1/05	18	15 students, 3 teachers	
Computer-Aided Geological and Petroleum Engineering Studies	Valencia, CA	7/28/05	30	27 (90% est)	
Troubleshooter Forum	Valencia, CA	9/22/05	32	29 (90% est)	
Workshop History: FY05 Attendance (11 events + 1 COMET)			**512**	**372 (73%)**	
Oilfield Safety and Recommended Practices	Valencia, CA	10/27/05	49	40 (82%)	78%
Panel on Power Generation Using Waste and Stranded Gas	Valencia, CA	11/22/05	41	35 (85%)	80%
Anniversary Forum: The Other 30% Recovery	Los Angeles, CA	12/9/05	25	21 (84%)	90%
Transformation of Old Data Sets (Software training)	Valencia, CA	2/23/06	32	25 (78%)	80%
Round Table Discussion on Power Reduction	Los Angeles, CA	3/30/06	18	14 (78%)	90%
Well Production Testing	Valencia, CA	4/27/06	43	36 (84%)	98%
Independents' Day Panel @ SPE Western Regional	Anchorage, AK	5/10/06	25	21 (84%)	85%
Air Injection for California Mature Oilfields	Valencia, CA	5/25/06	52	46 (88%)	97%

COMET Student Training/Internship	*Los Angeles, CA*	*6/26-30/06*	*25*	*0 (0%)*	*0%*
Subsidence Mitigation	Valencia, CA	7/27/06	32	27 (84%)	98%
Trouble Shooters Forum; Case Studies A-Z in Revamping Mature Fields	Valencia, CA	9/21/06	37	30 (81%)	96%
Workshop History: FY06 Attendance (10 events + 1 COMET)			**354**	**295 (83%)**	
Workshop History: FY07 Attendance (0 events)			**0**	**0**	
Recent Developments in Oilfield Distributed Power Generation and Other Power Saving Measures	Valencia, CA	11/29/07	38	34 (89%)	60% est.
Recent Advancements in Production Enhancement Techniques	Bakersfield, CA	3/6/08	48	40 (83%)	60% est.
Recent Advancements in Production Enhancement Techniques	Long Beach, CA	3/13/08	36	30 (83%)	60% est.
Well Logging (Schlumberger)	Long Beach, CA	5/14/08	39	36 (93%)	60% est.
Well Logging (Schlumberger)	Bakersfield, CA	5/15/08	56	54 (96%)	60% est.
Fracture Design (BJ Services)	Bakersfield, CA	6/25/08	21	18 (86%)	60% est.
Fracture Design (BJ Services)	Long Beach, CA	6/26/08	25	22 (88%)	60% est.
Geology for the Non-Geologist	Long Beach, CA	8/6/08	50	46 (92%	60% est.
Geology for the Non-Geologist	Bakersfield, CA	8/7/08	33	30 (91%)	60% est.
Artificial Lift Systems (Harbison-Fischer, Lufkin)	Bakersfield, CA	9/24/08	47	45 (96%)	60% est.
Artificial Lift Systems (Harbison-Fischer, Lufkin)	Long Beach, Ca	9/25/08	21	18 (86%)	60% est.
Workshop History: FY08 Attendance (11 events)			**414**	**373 (90%)**	
Oil & Gas Forum (CCCOGP, DOG)	Bakersfield, CA	10/30/08	205	160 (78%)	60% est.
2D & 3D Techniques for Evaluating Properties	Long Beach, CA	2/17/09	26	26 (100% est.)	
2D & 3D Techniques for Evaluating Properties	Bakersfield, CA	2/18/09	21	21 (100% est.)	
Introduction to Petroleum Engineering	Long Beach, CA	3/17/09	23	23 (100% est.)	
Introduction to Petroleum Engineering	Bakersfield, CA	3/18/09	42	42 (100% est.)	
Introduction to Petroleum Geology	Sacramento, CA	7/28/09	10	9 (90% est.)	
Open Hole Logging	Long Beach, CA	8/5/09	15	14 (90% est.)	
Open Hole Logging	Bakersfield, CA	8/6/09	36	32 (90% est.)	
Drilling Engineering 101	Long Beach, CA	9/22/09	17	15 (90% est.)	
Drilling Engineering 101	Bakersfield	9/23/09	42	38 (90% est.)	
Workshop History: FY09 Attendance (10 events)			**437**	**368 (84%)**	

APPENDIX B
REGIONAL FY09 ACTIVITY SUMMARY

PTTC Central & Eastern Gulf Coast Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
Workshop History: FY07 Attendance (11 events)			**681**	**519 (76%)**	
Workshop History: FY08 Attendance (11 events)			**422**	**332 (79%)**	
FY09 Events					
Bossier-Haynesville Shale, North Louisiana Salt Basin, Geological & Geochemical Characterization (Mississippi Geological Society)	Jackson, MS	11/5/08	48	44 (92%)	44%
Bossier-Haynesville Shale, North Louisiana Salt Basin, Geological & Geochemical Characterization (Fort Worth Geol. Society)	Fort Worth, TX	2/11/09	225	202 (90% est.)	
Lowstand Wilcox Sand Reservoir Potential in Northeast Gulf of Mexico (Presentation to Houston Geological Society, Mancini)	Houston, TX	3/9/09	110	99 (90% est.)	
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins in the Northern Gulf of Mexico (Houston Geological Society)	Houston, TX	3/9/09	77	69 (90% est.)	
Alternative Energy; Sustainable Development in a Challenging Economy (LSU Center for Energy Studies)	Baton Rouge, LA	4/22/09	111	89 (80% est.)	
Louisiana Oil and Gas Symposium (Baton Rouge Geological Society, Louisiana Geological Survey, LSU Center for Energy Studies, Louisiana Oil and Gas Association)	Baton Rouge, LA	5/19-20/09	96	77 (80% est.)	
Microbial Facies and Reservoirs (University of Alabama)	Tuscaloosa, AL	6/4/09	9	5 (56%)	
Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain (GCAGS)	Shreveport, LA	9/25/09	20	20 (100%)	
Water/Gas Shutoff and Conformance Control: What To Do Where	Lafayette, LA	9/30/09	8	8 (100%)	
Workshop History: FY09 Attendance (9 events)			**704**	**613 (87%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	1	48	44 (92%)	Workshops during FY09 significantly leveraged DOE-supported research performed at the University of Alabama with involvement of Louisiana State University. Workshops were held in Mississippi, Louisiana and Texas. Dr. Ibrahim Cemen has replaced Ernie Mancini as the RLO Director at Alabama. David Dismukes is serving in an acting capacity at LSU.
2nd Qtr	3	412	370 (90%)	
3rd Qtr	3	216	171 (79%)	
4th Qtr	2	28	28 (100%)	
FY09	9	704	613 (87%)	

FY09 Avg. Attendance = 78 vs. 38 in FY08 vs. 62 in FY07

PTTC Eastern Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (% ind.)	
Workshop History: FY07 Attendance (12 events)			**761**	**634 (83%)**	
Workshop History: FY08 Attendance (17 events)			**1,114**	**971 (87%)**	
FY09 Events					
More! Rocks In Your Head	Pittsburgh, PA	10/11/08	20	0 (0%)	
Geology & Geophysics Applied in Industry	Pittsburgh, PA	10/11/08	24	0 (0%)	
Shale Gas Project Planning	Pittsburgh, PA	10/11-12/08	42	42 (100%)	
Putting It All Together, Optimizing Frac Designs	Pittsburgh, PA	10/15/08	50	50 (100%)	
Computer Mapping for Petroleum Exploration	Pittsburgh, PA	10/15/08	50	50 (100%)	
Advanced Logging (Appalachian Geol. Soc.)	Morgantown, WV	2/12/09	69	55 (80%)	
Computer Mapping for Petroleum Geologists (Illinois Geological Survey, IL O&G Assoc.)	Evansville, IN	3/4/09	40 est.	36 (90% est.	
Appalachian – Unconventional Since 1859, Take 2 (Pittsburgh Assoc. of Petr. Geologists)	Pittsburgh, PA	3/19/09	112	103 (92%)	
Michigan Field Experiences (several sponsors)	Mt. Pleasant, MI	3/26/09	167	150 (90% est.)	
Keys to Complex Well Economic Success	Morgantown, WV	5/14/09	33	32 (97%)	
Applied Reservoir Geology for Engineers	Pittsburgh, PA	7/28/09	25	18 (72%)	
Reservoir Engineering for Petroleum Geologists (Ohio Geological Society)	Columbus, OH	9/1-2/09	22	20 (91%)	
Field Trip: Sedimentology, Stratigraphy and Hydrocarbon Potential of the New Albany Shale in the Illinois and Appalachian Basins of the Eastern U.S. (AAPG Eastern Section)	Evansville, IN	9/19/09	43	43 (100% est.)	
Appraising and Developing Shale Gas Reservoirs (AAPG Eastern Section, AAPG Energy Minerals)	Evansville, IN	9/20/09	34	34 (100% est.)	
Field trip/core workshop: The Geneva Dolomite (Devonian) in the Illinois Basin (AAPG Eastern S)	Evansville, IN	9/23/09	29	29 (100% est.)	
Appraising and Developing Coalbed Methane Reservoirs (AAPG Eastern Section, AAPG EMD)	Evansville, IN	9/23/09	14	14 (100% est.)	
Petroleum Geology and Geochemistry for Thermogenic Shale-Gas Evaluation: A Primer for Engineers and Scientists Focused on Marcellus Exploration and Development in the Appalachian Basin (SPE Eastern Region)	Charleston, WV	9/23/09	32	28 (88%)	
Workshop History: FY09 Attendance (17 events)			**781**	**686 (88%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	5	186	142 (76%)	Eleven of the 17 regional events were organized by West Virginia University. Seven workshops were held in Pittsburgh. All Illinois Basin workshops were held in Evansville, IN. Field experiences were the focus in the Michigan workshop. Shale gas topics were a common them in the Appalachian and Illinois basins.
2nd Qtr	4	388	344 (89%)	
3rd Qtr	1	33	32 (97%)	
4th Qtr	7	174	168 (97%)	
FY09	17	781	686 (88%)	

FY09 Avg. Attendance = 46 vs. 66 in FY08 vs. 63 in FY07

PTTC Midcontinent Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) from Industry	
Workshop History: FY07 Attendance (9 events)			**685**	**627 (92%)**	
Workshop History: FY08 Attendance (6 events)			**256**	**240 (94%)**	
FY09 Events					
Wellbore and Reservoir Diagnostics and Problem Remediation	Wichita, KS	11/15/08	88	85 est. (97%)	
Evaluating O&G Reserves and Economics in an Uncertain Time	Wichita, KS	2/5/09	65	59 (90% est.)	
Pumpers' Workshop	Russell, KS	2/26/09	46	41 (90% est.)	
TORP Oil Recovery Conference	Wichita, KS	4/1-2/09	88	79 (90% est.)	
Applied Reservoir Geology for Engineers (SPE Midcontinent Section)	Tulsa, OK	4/21/09	34	32 (94%)	
Keys to Complex Well Economic Success	Oklahoma City, OK	5/19/09	27	23 (85%)	
Water/Gas Shutoff and Conformance Control – Knowing What To Do, When	Tulsa, OK	6/30/09	22	22 (100%)	
Workshop History: FY09 Attendance (7 events)			**370**	**341 (92%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	1	88	85 (97%)	Four workshops were conducted in Kansas and three in Oklahoma. Oklahoma workshops were coordinated by Headquarters. Starting in FY10, Mohan Kelkar with the University of Tulsa Petroleum Engineering Department will coordinate workshops for Oklahoma and Arkansas.
2nd Qtr	2	111	100 (90%)	
3rd Qtr	4	171	156 (91%)	
4th Qtr	0	0	0	
FY09	7	370	341 (92%)	

FY09 Avg. Attendance = 53 vs. 43 in FY08 vs. 76 in FY07

PTTC Rocky Mountain Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Ind.	
Workshop History: FY07 Attendance: (8 events plus 2 Futures)			**553**	**488 (88%)**	
Workshop History: FY08 Attendance: (20 events plus 2 Futures)			**753**	**714 (95%)**	
FY09 Events					
Uranium Geology & Geochemistry	Golden, CO	10/20-21/08	32	32 (100%)	
GeoGraphix, An Overview & Refresher	Golden, CO	11/7/08	10	10 (100%)	
Presentation @ Great Plains Energy Expo (Dave Burnett, Texas A&M – Env. Friendly Oil & Gas)	Bismarck, ND	11/10-11/08	300	A presentation – not counted as a workshop.	
Carbonate Diagenesis, Dolomitization and Porosity Evolution	Golden, CO	11/11/08	33	33 (100%)	
GIS and GPS for Earth Scientists	Golden, CO	11/21/08	20	20 (100%)	
Paradox Basin Core Workshop	Denver, CO	12/4/08	47	47 (100%)	
Petra Basics	Golden, CO	12/5/08	20	20 (100%)	
Basic Openhole Log Interpretation	Golden, CO	1/21-22/09	52	52 (100%)	
Hydraulic Fracturing: Measurement, Characterization and Analysis	Golden, CO	2/16/09	19	19 (100%)	
Source Rocks 101: What the Exploration Geologist, Geophysicist and Production Engineer Should Know About Source Rocks	Golden, CO	2/23/09	32	32 (100%)	
Uranium Geology & Geochemistry	Golden, CO	3/9-10/09	16	16 (100%)	
Petroleum Geology for Non-Geologists	Golden, CO	3/12-13/09	38	38 (100%)	
Petra Basics	Golden, CO	4/6/09	20	20 (100%)	
Completions and Stimulations for Geologists (Minot State University)	Minot, ND	4/22/09	14	14 (100%)	
GeoGraphix Training, An Overview & Refresher	Golden, CO	5/15/09	15	15 (100%)	
Keys to Complex Well Economic Success	Denver, CO	5/21/09	22	22 (100%)	
Descriptive Lithology; Analysis of Cuttings and Cores (AAPG)	Golden, CO	6/11/09	28	28 (100%)	
Futures in Energy Student Training/Internship	Golden, CO	6/15-20/09		17 students, 20 teachers	
Petra Basics	Golden, CO	7/8/09	20	15 (75%)	
Reservoir Fluids and Core Analyses (Core Labs)	Denver, CO	7/22/09	26	26 (100%)	
Unconv. Gas, Gas Shales and CBM (RMAG)	Denver, CO	9/14/09	350	350 (100%)	
Coalbed Methane	Golden, CO	9/15/09	24	24 (100%)	
Reservoir Engineering for Petroleum Geologists	Golden, CO	9/23-24/09	23	23 (100%)	
Workshop History: FY09 Attendance: (21 events plus 1 Futures)			**861**	**856 (99%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	6	162	162 (100%)	Of the regions, the Rocky Mountain Region exhibited the highest attendance. Excluding the cooperative event with RMAG (9/14/09), attendance averaged 26. High attendance is achieved by maintaining high activity. Most FY09 activities were held in the Denver area.
2nd Qtr	5	157	157 (100%)	
3rd Qtr	5	99	99 (100%)	
4th Qtr	5	443	438 (99%)	
FY09	21	861	856 (99%)	

FY09 Avg. Attendance (excluding Futures) = 41 vs. 38 in FY08 vs. 64 in FY07

PTTC Texas & SE New Mexico Region

Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) Industry	
Workshop History: FY07 Attendance (7 events)			**745**	**723 (97%)**	
Workshop History: FY08 Attendance (5 events)			**159**	**159 (100%)**	
FY09 Events					
Sequence Stratigraphy and Depositional Systems of East Texas Field, A Core Workshop (Bureau of Economic Geology, UT Austin)	Houston, TX	11/18/08	50	50 (100% est)	
Questions, Answers and Challenges in Mudrock Systems Research: Technologies and Applications for Shale Reservoir Successions (Bureau of Economic Geology, UT Austin)	Houston, TX	11/20/08	105	105 (100% est.)	
Completions and Stimulations for Geologists (East Texas Geological Society)	Tyler, TX	3/4/09	49	49 (100% est.)	
How To Start/Fix/Manage a Small Waterflood (Texas Alliance)	Farmers Branch, TX	3/24/09	84	84 (100% est.)	
Source Rocks 101	Houston, TX	7/28/09	28	28 (100% est.)	
Completions & Stimulations for Geologists (South Texas Geological Society)	San Antonio, TX	8/6/09	38	38 (100% est.)	
How To Start/Fix/Manage a Small Waterflood	Houston, TX	8/19/09	14	14 (100% est.)	
Log Analysis of Shaly Sands (East Texas Geological Society)	Tyler, TX	9/17/09	43	42 (98% est.)	
Workshop History: FY09 Attendance (8 events)			**411**	**410 (99%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	2	155	155 (100%)	Following a low point in FY08, this regional program is re-strengthening in both activity and attendance. Events were held in four different Texas cities. There were additional workshops planned, some in Midland, that were cancelled when pre-registration remained low. The RLO policy is to "not hold a workshop" if pre-registration will not achieve financial break-even.
2nd Qtr	2	133	133 (100%)	
3rd Qtr	0	0	0	
4th Qtr	4	123	122 (98%)	
FY09 YTD	8	411	410 (100%)	

FY09 Avg. Attendance = 51 vs. 32 in FY08 vs. 56 in FY07 (excluding CO2 conference)

PTTC West Coast Region

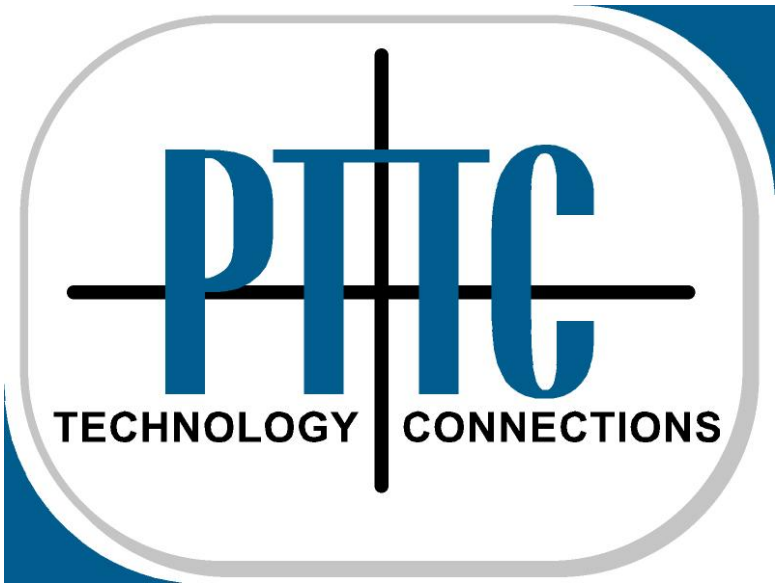
Topic (main cosponsors in parentheses)	Location	Date	Attendance		Repeat Attend.
			Total	# (%) from Industry	
Workshop History: FY07Attendance (no events)			**0**	**0**	
Workshop History: FY08Attendance (11 events)			**414**	**373 (90%)**	
FYO9 Events					
Oil & Gas Forum (CCCOGP, DOG)	Bakersfield, CA	10/30/08	205	160 (78%)	60% est.
2D & 3D Techniques for Evaluating Properties	Long Beach, CA	2/17/09	26	26 (90% est.)	
2D & 3D Techniques for Evaluating Properties	Bakersfield, CA	2/18/09	21	21 (90% est.)	
Introduction to Petroleum Engineering	Long Beach, CA	3/17/09	23	23 (90% est.)	
Introduction to Petroleum Engineering	Bakersfield, CA	3/18/09	42	42 (90% est.)	
Introduction to Petroleum Geology	Sacramento, CA	7/28/09	10	9 (90% est.)	
Open Hole Logging	Long Beach, CA	8/5/09	15	14 (90% est.)	
Open Hole Logging	Bakersfield, CA	8/6/09	36	32 (90% est.)	
Drilling Engineering 101	Long Beach, CA	9/22/09	17	15 (90% est.)	
Drilling Engineering 101	Bakersfield	9/23/09	42	38 (90% est.)	
Workshop History: FY09Attendance (10 events)			**437**	**368 (84%)**	

FY09 Statistical Summary By Quarter

	Workshops			Comment
	#	Attend	Industry No. (%)	
1st Qtr	1	205	160 (78%)	In most instances, for a given topic, the RLO will conduct workshops in both Bakersfield and Long Beach. In FY09 workshops covered five topics, plus the region supported CCCOGP's Forum. For the most part, topics reinforced the basics of different technology areas in both geology and engineering.
2nd Qtr	4	112	100 (90%)	
3rd Qtr	0	0	0	
4th Qtr	5	120	108 (90%)	
FY09 YTD	10	437	368 (84%)	

FY09 Avg. Attendance = 44 vs. 38 in FY08 vs. 34 in FY06 (no program in FY07)

APPENDIX C
TECHNOLOGY UPTAKE AND IMPACT ON DOMESTIC RESERVES (MARCH 2005)



Applying Technologies Key to Independents Producing More Domestic Oil and Gas

March 2005

Technology Uptake and Impact on Domestic Reserves

U.S. independents now drill the vast majority of domestic oil and gas wells, some 85%. They also produce about 60% of domestic natural gas and 40% of domestic crude oil. Recent higher oil and natural gas prices are accompanied by increasing costs. Regardless of oil and gas prices, it boils down to economics. Application of newer technologies impacts those economics—lowering costs and increasing productivity and recovery.

Applying newer technologies independents are now able to:

- Recover more oil and natural gas from existing reservoirs and
- Explore for and develop fields/reservoirs that were previously too small to pursue

The incremental production and reserves discovered from applying newer technologies helps to:

- Moderate U.S. dependence on foreign energy and
- Maintain a viable domestic exploration and production industry

There is a **technology uptake period** associated with the adoption of every new technology. Shortening the time required for technologies to be broadly adopted reaps major benefits for:

- Oil and gas producers,
- Local economies where independents operate, and
- The consuming public

The Petroleum Technology Transfer Council (PTTC) was created some ten years ago to be an information resource that would enable independents to more quickly assimilate the knowledge required to make informed decisions about applying newer technologies to their problems or opportunities. Since inception PTTC has:

- Conducted nearly 1,200 workshops
- Delivered information/data through an extensive website network www.pttc.org
- Connected producers, the research community, and the technology provider community

PTTC recently estimated economic impact in **just eleven areas** where independents are broadly applying technologies. These areas are less than half of the targeted, industry-identified and –directed areas where PTTC focuses its effort. PTTC **impact factors** were estimated for each area. These impact factors are an estimate of the % of industry economic activity that was influenced by PTTC activity considering timing and quantity of PTTC technology transfer activities, industry participation and direct industry feedback about what % of industry value could be attributed to PTTC. Here's what we found:

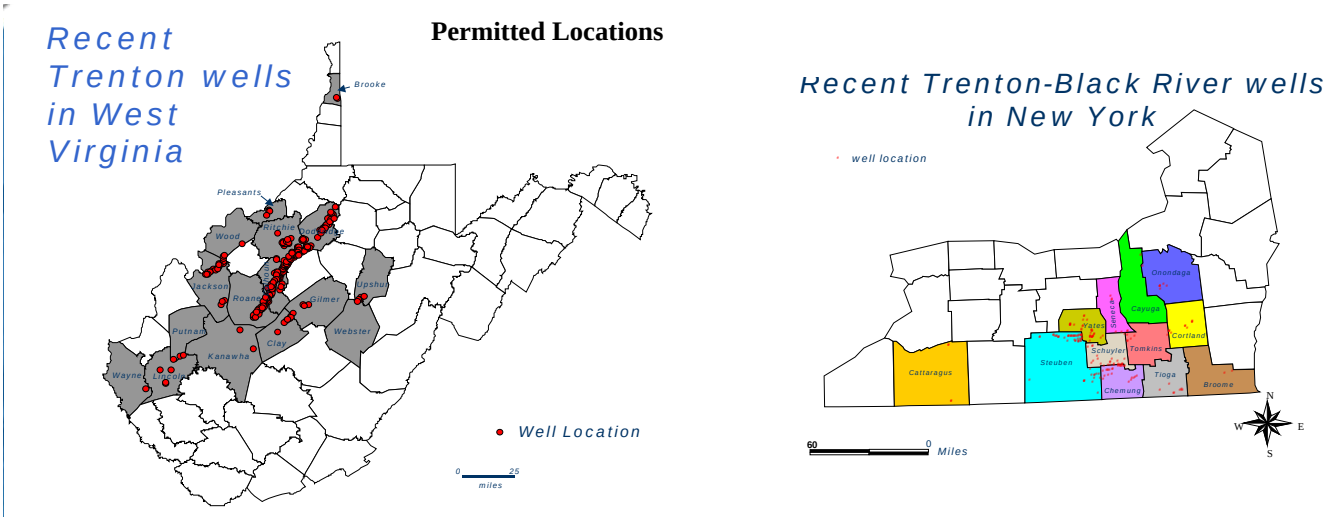
- Impact factors ranged from 5 to 25%
- Of 1,266 million barrels of oil equivalent reserves that were realized, 88 million barrels could be logically attributed to PTTC activity.
- Significant operating cost reductions occurred.
- Productivity was improved and training requirements reduced.
- The service provider community so vital to health of the domestic E&P industry also realized significant value.

PTTC Impact in Eleven Selected Technology Areas

Technology Application (and geographic area)	Year Started TechArea	Industry Reserves Added MM BOE	Impact-Adjusted Reserves Added MMBOE	PTTC Impact Factor
1. Trenton-Black River, Appalachia	1999	40	4.00	0.10
2. Illinois Aux Vases (Mill Shoals Field)	1998	2.05	0.51	0.25
3. Michigan Horizontal Well Completions	1995	149	22.35	0.15
4. Kansas Polymer Gel in Arbuckle	2001	2.56	0.64	0.25
5. Kansas Coalbed Methane (CBM)	1999	33.3	5.00	0.15
6. Kansas GasGun Stimulations	1998	0.378	0.06	0.15
7. Rockies Powder River Basin CBM	1999	943	47.15	0.05
8. Rockies Software Training	1996	Value received from (1) reduced training costs and (2) major productivity gains.		0.25
9. Oklahoma Hunton Play	2000	16.2	4.05	0.25
10. Oklahoma Coalbed Methane	1999	76.3	7.63	0.10
11. Permian Basin Wellbore Mgmt	2001	3.36	0.34	0.10
12. Academic		Plus significant operating cost reductions		
PTTC Impact in Selected Areas		**1,266**	**87.73**	

Trenton-Black River in Appalachia

The hottest play in the Appalachian Basin continues to be the deep Trenton-Black River, a high tech, high-risk play that began in New York in 1995. High initial potential tests, followed by high-sustained production attracted national interest. Activity extended the play to West Virginia in 1999. Annual gas production grew from a BCF or so in 1997/1998 to about 6 BCF in 1999-2000, then jumped dramatically to nearly 18 BCF in 2001 and some 32 BCF in 2002. Activity and production continue strong in New York, although activity has dropped some in West Virginia with poorer success. There are now about 200 Trenton-Black River completions in New York and 30 completions in West Virginia.



PTTC's Involvement in the Technology Adoption Process

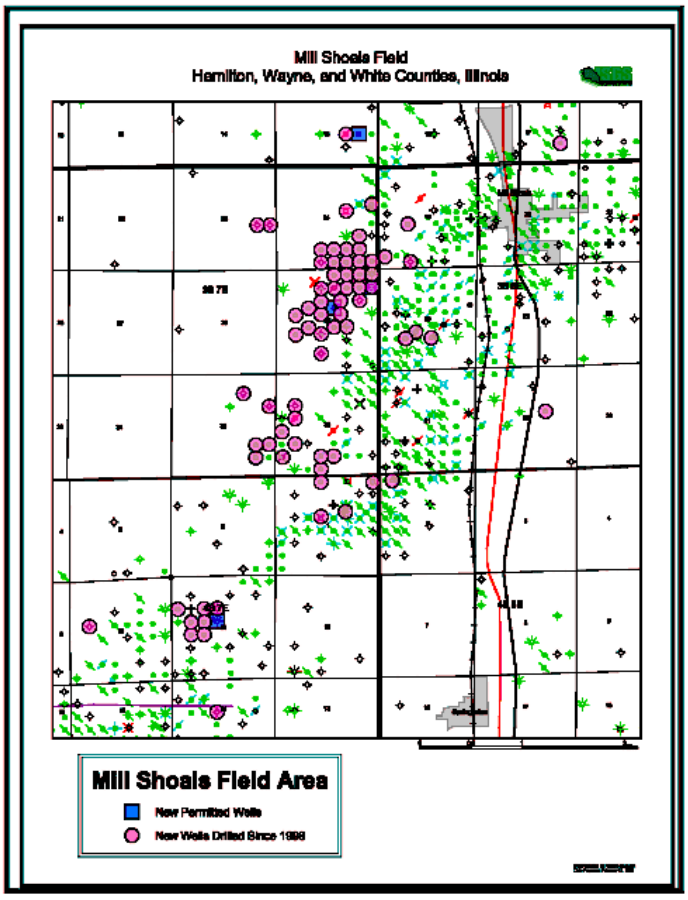
PTTC became involved soon after discovery of the Cottontree field in West Virginia, holding a workshop (Nov 1999) that focused on evolving exploration concepts. More than 100 attendees came from 13 states and Canada. PTTC soon became the "focal point" for information and clarifying evolving exploration concepts. Attendance at a 2nd workshop in May 2001 exceeded facility capacity and people were turned away. It was repeated in Aug 2001 along with a core workshop. Again, more than 100 attended. Attendance remained high at a follow-on workshop on "Operational Aspects" in April 2002. As the play matured, industry began to recognize what they didn't know. Working with PTTC, West Virginia University assembled stakeholders, identified what R&D was still needed, and formed an industry-supported Consortium that subsequently received DOE funding support. Throughout this entire process, staff gave presentations across the country, responded to trade press, etc. A GIS-based information section has been developed to continue delivering play information to industry.

Economic Benefits From Trenton-Black River Development

Reserve/cost data:	New York	$1.5 million	1.5 BCF
	W. Virginia:	$2.0 million	1.0 BCF
New reserves:	New York	200 wells x 75% success x 1.5 BCF	**225 BCF**
	W. Virginia	30 wells x 50% success x 1.0 BCF	**15 BCF**
Value to vendor community:	New York	200 wells x $1.5 million	**$300 million**
	W. Virginia	30 wells x $2.0 million	**$60 million**

Mill Shoal "Aux Vases" Field in Illinois

The Middle Mississippian Aux Vases Formation is a major producing formation in the Illinois Basin, having produced close to one billion barrels of oil. Sandstone reservoirs in the Aux Vases Formation were the subject of detailed reservoir characterization studies by the Illinois Geological Survey. Case studies and exploitation insights from this play-based effort were shared through a PTTC play-based workshop in Illinois in early 1998. The first well in the Mill Shoals Field was drilled later that year.



Local independent reevaluates 1939 field using new exploitation concepts presented during PTTC workshop

Success with initial field extensions led to 64 new wells (41 producers, 8 injection wells, 15 dry holes) being drilled

Development confirms exploitation

More than five-fold increase in field production

PTTC's Involvement in the Technology Adoption Process

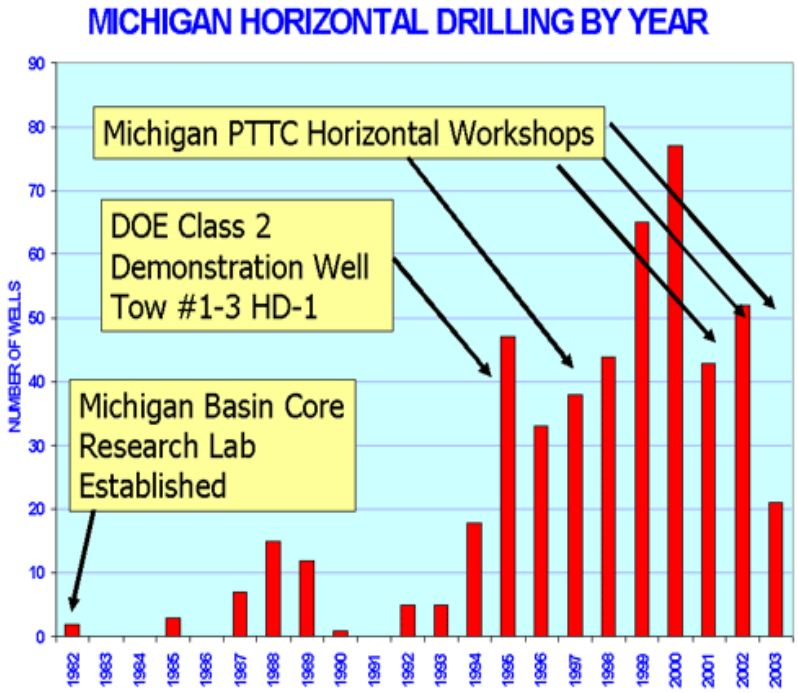
Concepts presented at the early 1998 workshop provided the impetus for John Basnett of Basnett Inc. to reevaluate an earlier prospect leading to the discovery of a field extension in the Aux Vases Sandstone at Mills Shoals Field in Hamilton County, Illinois later that year. Subsequent development has led to a total of 64 new wells (41 producers, 8 injection wells, 15 dry holes). In completing this development work, operators have confirmed exploitation concepts presented during the workshop.

Economic Benefits From Mill Shoals Development (workshop participants alone)

New reserves:	41 wells x 50,000 bbls/well	**2.05 MMBO**
Value to vendor community:	49 wells x $175,000/well (prod. & injection)	**$8.6 million**
	15 wells x $100,000/well (dry holes)	**$1.5 million**

Horizontal Drilling in Michigan

Although there was a horizontal well as early as 1982, Michigan horizontal activity really began in the mid 1990s when the Tow #1-3 HD-1 completion in the Dundee demonstrated that horizontals could access significant reserves in mature reservoirs. The Tow well was part of a DOE Class 2 project. Now there are some 50 or more horizontal completions being drilled each year. About 88% of completed horizontals are considered to be successful. There are now 450+ horizontal completions (as of late 2003). All the wells have been drilled in known fields in previously productive reservoir zones. Most of these fields were considered to be depleted or approaching an economic productivity limit with respect to existing vertical wells. About 21% of the horizontal wells have been drilled in gas storage reservoirs to greatly enhance injection or withdrawal rates.



Current horizontal activity spawned by DOE Class 2 project (Tow #1)

Producers took action with insights from 2001 Maurer workshops

Michigan Horizontal Case Studies, 3/30/03 workshop, record participation of 197

PTTC's Involvement in the Technology Adoption Process

Western Michigan University, which serves as PTTC's Michigan satellite, was directly involved in the DOE Class project that spurred horizontal activity, in follow-on horizontal wells and in tech transfer from the entire effort. Michigan PTTC supported two workshops in 2001 where Bob Knoll, representing Maurer Technologies, delivered Maurer's expertise about the team process for successfully implementing horizontal completions. Follow-up calling to participants indicated that many participants were taking action with the information they received. Working with the SPE Michigan chapter, the region sponsored a workshop on "Case Studies of Michigan Field Experience with Horizontals" in spring 2003. This activity drew 197 attendees, which is very high for Michigan and reveals strong, continued industry interest in horizontal completions.

Economic Benefits From Horizontal Drilling in Michigan (based on 450 wells)

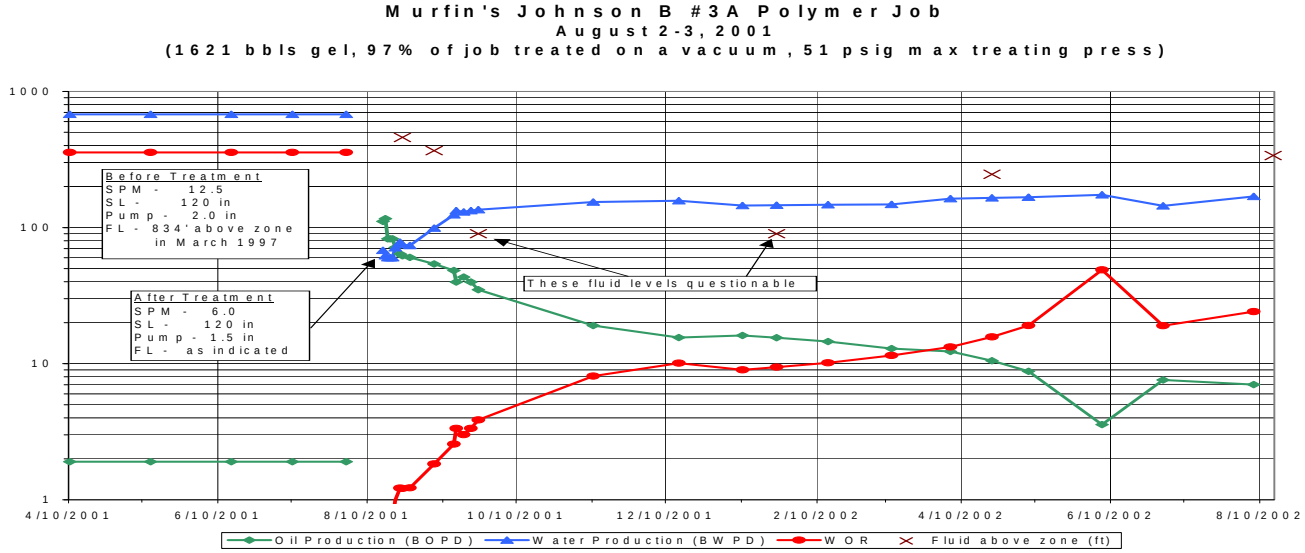
Shallow wells: 40% of wells, $400M, 200 MBOE Deeper wells: 60% of wells, $900M, 420 MBOE

Incremental reserves:	Shallow Wells: 180 wells x 200 MBOE	**36 million BOE**
	Deeper Wells: 270 wells x 420 MBOE	**113 million BOE**
Value to vendor community:	Shallow Wells: 180 wells x $400,000	**$72 million**
	Deeper Wells: 270 wells x $900,000	**$243 million**

Published Case Study: "Horizontal Drilling Increases Reef Production," *World Oil*, July 2003 (www.worldoil.com/magazine/MAGAZINE_DETAIL.asp?ART_ID=2077&MONTH_YEAR=Jul-2003)

Polymer Gel Treatments in Kansas' Arbuckle

The Arbuckle formation in Kansas is a very mature horizon, with production occurring since early in the 20th century. Arbuckle reservoirs are typically visualized as an oil column on top of a strong water aquifer. Common production characteristics are high initial water-free oil production rates, large cumulative oil production, followed by water encroachment that leads to high volume, low oil-cut marginal producing wells. From a conceptual standpoint, polymer gel technology is tailor-made for the karstic, fractured reservoir. Production-side polymer gel treatments in the Arbuckle are not new. What is new is greater, more profitable success due to (1) more reliable gel technology and (2) field experience that larger volume treatments provide more sustained water shutoff. Since early 2001 more than 30 operators have performed about 400 Arbuckle treatments. The vast majority, 80% or more, are definite economic successes, paying out the $30,000 to $50,000 treatment cost in six months or less. Water production decreases significantly, and oil production increases also occur in most cases.



Average incremental oil recovery per treatment to date (late 2003) is 5,500 bbls. Ultimate incremental recovery per treatment of 8,000 bbl is considered conservative with most wells still profitably producing. Water production initially averages 700 bwpd less, but with increases over the estimated 4-yr life of treatments, average reduction of 400 bwpd is reasonable, equating to about $15,000/yr @ 10 cents/bbl. Value from incremental oil and reduced operating expense are about the same.

PTTC's Involvement in the Technology Adoption Process

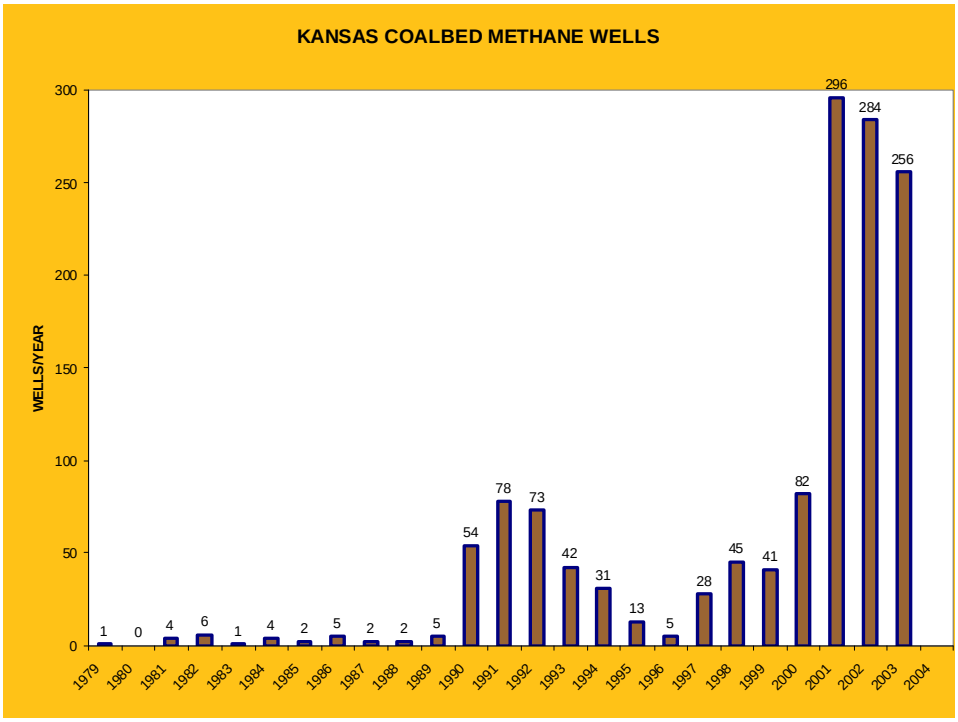
The Tertiary Oil Recovery Project (TORP) at KU has a long history of RD&D in polymer gel applications. This history gave PTTC early credibility. Just as initial larger volume treatments in Arbuckle producers were beginning, PTTC held a polymer gel workshop. Presentations about polymer gel treatments were integral to activities throughout 2001-2002, including talks outside the region. Insights were part of PTTC's manual on "Produced Water & Associated Issues" (early 2003) that was the basis for workshops held across the country in 2003. A special forum was held in early 2003 only for those operators having performed treatments and the vendors supplying those services. Special PTTC support helped develop a "polymer gel" website (www.kgs.ukans.edu/PTTC/gel/index.html) that came online early in 2004. Workshops held in early 2004 featured polymer gel treatment results and the database.

Economic Benefits From Arbuckle Polymer Gel Treatments in Kansas

Incremental reserves:	400 wells x 80% success rate x 8,000 bbl	**2.56 million bbls**
Reduced operating costs:	400 wells x 80% success rate x $15,000/yr x 4 yr	**$19.2 million (4 yrs)**
Value to vendor community:	400 wells x $40,000/treatment	**$16 million to date**

Coalbed Methane Development in Kansas

Although first beginning in the 1980s, coalbed methane (CBM) development of any extent in southeast Kansas did not occur until the early 1990s. Activity stayed below 50 wells per year until 2000, when development began to take off. Now there are 250 to 300 CBM wells per year being drilled. Initial producing rates vary widely, ranging from 10 to occasionally above 200 Mcfd. CBM production in Kansas has increased from about 3 Bcf/year prior to 2000 to around 9 Bcf/year. On average for the nearly thousand wells added in recent years, production averages less than 40 Mcfd. Well costs are in the $50,000 to $70,000 range for a typical multi-seam completion. Reserves per seam are in the 125 MMCF range, with per well reserves of 200 MMCF being reasonable. Operating costs range from $400 to $1,200 per month. Since produced water is saline, subsurface water disposal is required.



PTTC's Involvement in the Technology Adoption Process

A mid-1999 regional workshop, held when less than 50 CBM wells per year were being drilled, drew 123 attendees, which is very high attendance for the Kansas producing community. Industry ran with information received from this workshop and the lessons learned in other CBM plays and began drilling 250 to 300 wells per year. Later PTTC events in 2001, 2002 and 2003 continued to feed information to the developing industry. The Kansas Geological Survey (KGS), a partner in the PTTC effort in Kansas, is gathering gas content data, mapping coal horizons, and developing depositional models that will fuel further development. This effort includes looking further north at potential in the Forest City Basin. KGS maintains CBM data of interest on a "Coalbed Methane Project" website. Staff supports Oklahoma's Coalbed Methane Forum in Tulsa, delivers presentations in Kansas and Oklahoma, interacts with PTTC's South Mid-continent Region, and is working with industry to develop a major regional "CBM meeting" in fall 2004 in Tulsa.

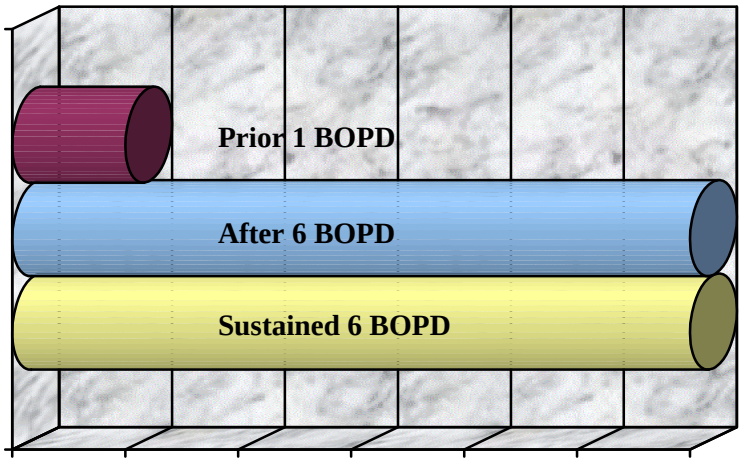
Economic Benefits From CBM Development in Kansas

Incremental reserves:	1,000 wells x 200 MMCF/well	**200 BCF**
Value to vendor community	1,000 wells x $60,000/well	**$60 million**

Online Insights/Coal & Well Data: http://www.kgs.ukans.edu/CBM/index.html

Solid Propellant GasGun™ Stimulation Treatments in Kansas

The GasGun™ is a low cost, solid propellant tool used downhole to create multiple fractures, which stimulates well productivity. Advantages over hydraulic fracturing include minimal vertical growth of fractures, multiple fractures to stimulate an entire zone, and no need for costly pumping equipment to inject fluid at high pressures. Because fractures tend to stay in zone, it has particular advantage as a pre-treatment prior to additional stimulation with acid or hydraulic fracturing. Its low cost makes it particularly attractive for marginal wells. The technology, which became commercially available in mid-1998, builds upon early research by Sandia National Laboratories in the 1970s.



Arbuckle dolomite @ 3433 ft
Barton County, Kansas
6 ft GasGun in cased hole

Incremental reserve volumes not large, say 2000 bbls, but with low costs ($4,000 to $6,000, including well servicing costs), economics are still attractive for operators.

PTTC's Involvement in the Technology Adoption Process

Early applications of the technology were in Appalachia and the Illinois Basin. Success there led PTTC to publish a case study in *World Oil* in Sep 2001. This led to early 2002 presentations about the technology at the North Mid-continent Region's Tech Fair in Wichita and Independents' Day at the SPE/DOE Improved Oil Recovery Symposium in Tulsa. Kansas operators quickly accepted the technology, and there now have been about 270 treatments performed in Kansas. Production typically increases two- to three-fold, although some treatments have increased production more than 10-fold. Economic success rate is about 70%. During 2003 PTTC worked with the vendor and operators who have performed treatments, documenting field experience in Kansas. Insights and individual well data are now available online.

Economic Benefits From GasGun™ Stimulation in Kansas

Incremental reserves:	270 treatments x 70% success x 2,000 bbl	**378,000 bbls**
Value to vendor community:	270 treatments x $5000	**$1.35 million**

Exposure in Kansas led to wireline companies in other states contacting GasGun™ about being a distributor. Agreements were made and newer technologies spread to new markets with minimal vendor investment. Producers in these other states are now realizing benefits from the technology.

Online insights/well data: www.nmcpttc.org/Case_Studies/GasGun/index.html

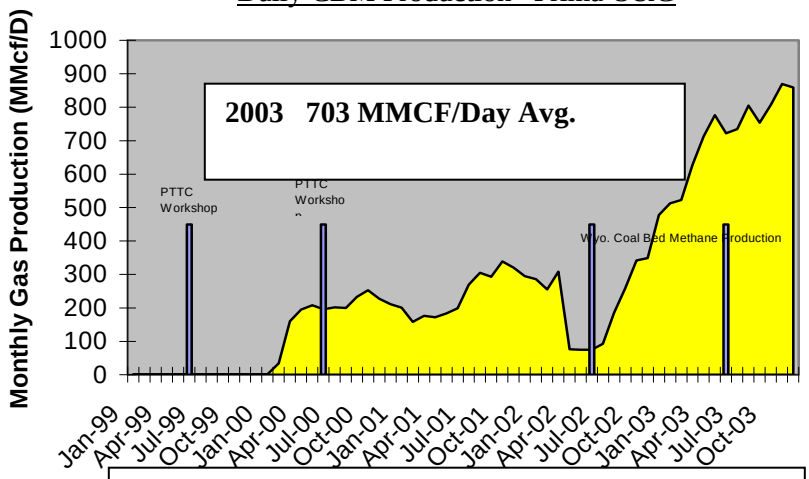
Powder River Basin Coalbed Methane Development

Although a few early wells, coalbed methane (CBM) activity is really a post-1996 activity. 360 wells were producing in 1997. Activity began to increase in 1998 with 651 producing wells, and then jumped dramatically to nearly 7,700 producing wells in 1999. In 2003 the producing well count exceeded 12,300. Annual production has grown from about 30 BCF per year in 1998 to about 340 BCF per year in 2003. Conservative estimates of CBM reserves in the Powder River Basin range from 7 to 12 TCF, but there are estimates as high as 40 TCF. Industry expectations are that activity/production may experience a flattening in 2004 for several reasons, then resume rapid growth in 2005.

PTTC Involvement in the Technology Adoption Process

The Rocky Mountain Region's first CBM technology transfer event was a co-sponsored short course, which drew 182 attendees, presented in early 1999. The Region was one of several co-sponsors for the first major regional conference in Jun 99. This event drew 500 people. This major conference has been repeated in 2000, 2002 and 2003. In a five-year time span, more than 1,800 individuals have participated and drawn insights from activities focused on Powder River Basin CBM.

Daily CBM Production –Prima O&G



Small independent) impacted by PTTC
1999 – 4 attendees 2003 – 2 attendees

Major players participate in PTTC
>> Williams (29% current production) sent 10 attendees in 1999
>> Pennaco Energy (11% current production) sent 7 attendees in 1999

Significant information resource for smaller independents (see Prima left)

$120M - $150M/well (Use $135M)

250 MMCF Wyodak
630 MMCF Big George
Use 350 MMCF on Average

All Powder River CBM (2003)
12,336 producing wells 3,832 shut-in

Economic Benefits From Powder River CBM Play

	# wells	Value to Vendor Community	Reserves @ 350MM	Reserves BOE
Prima Oil and Gas	418	$56.4 million	146.3 BCF	24.3 million
Total Powder River CBM	16,168	$2.18 billion	5.66 TCF	943 million

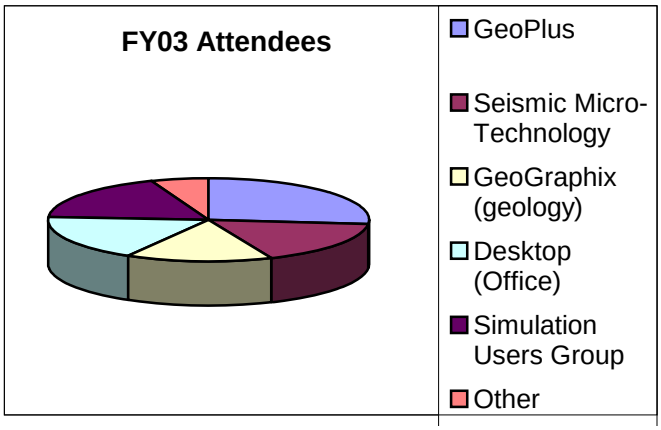
Online Information About Powder River Basin CBM:
Wyoming Oil and Gas Commission:
http://wogcc.state.wy.us/coalbedMenu.cfm?Skip='Y'&oops=ID1679

Software Training in The Rocky Mountain Region

Geoscience software has had a major impact in the E&P industry during the time frame of PTTC's existence. This software enables users to get better answers, faster. Since most individuals working in the domestic industry pre-date the software revolution, cost- and time-efficient training is essential for realizing the productivity gains that ever-improving software packages offer. Software developers and others offer software training, but it is typically costly and not local. Plus trainers often approach training from an "academic" perspective rather than a "professional user" perspective.

PTTC's Involvement in the Technology Adoption Process

Early on the Rocky Mountain Region recognized the need for software training. It was the driving force, working with the Colorado School of Mines (CSM), American Association of Petroleum Geologists, and industry donors, in getting a training lab built at CSM. Courses were developed and experienced geoscience trainers identified. Although both UNIX and PC training was initially offered, increased PC capabilities now direct the effort almost exclusively to PC-based packages. The Region now offers more than 20 courses per year in public or in-house settings. During the industry downturn of the late 1990s, the software training program was a major mid-career resource for experienced geoscientists retooling themselves. Recent focus is on sharing information online through a "Low Cost Software Fair."



Nearly 1,500 individuals have completed software training

Mid-career training resource during the late 1990s

Industry interest determines software focus

Several major vendors, DOE, office applications, niche packages

Follow-up calling to participants established lower-upper range for value of the training alone. Producers recognize that value comes from applying the software in exploration. One producer estimated value of training alone @ 1% of exploration budget, while attributing 5% to the combination of software and training. Another producer noted that productivity doubled, enabling twice as many prospects. Of that doubling, it is reasonable to attribute 50% to the person, 25%, to the software and 25% to the training that enables the man/software to work. This equates to 12.5% of exploration budget for training impact.

Economic Benefits From Software Training in the Rockies

Training costs alone:	Lower	1,500 individuals x $1000	**$1.5 million Use $3 million**
	Upper	**1,500 individuals x $3000**	$4.5 million

Type of Training	Sample of Companies Operating in Rockies	2002 Exploration Budget $MM	Value of Training w Doubled Productivity (12.5% of budget) $MM
Inhouse	Amerada Hess	319	39.9
Inhouse	Encana	632	79.0
Inhouse	Questar	154	19.3
Public	EOG Resources	61	7.6
Public	Tom Brown (Rockies)	81	10.1
Public	Williams Co (adjusted)	221	27.6
Total from 6 Select Companies		1,468	**183.5**

Hunton Play in Oklahoma

The South Midcontinent Region has placed a strong emphasis on play-based workshops (12 different play studies). The Oklahoma Geological Survey (OGS) develops comprehensive regional play analyses, which are professionally published and made available to industry at minimal cost. Early play work received DOE support through a Class 1 project. Recent play analyses have been funded entirely by OGS. Workshops transferring information and insights are coordinated through PTTC's South Midcontinent Region. Initially, full-day workshops are held, then half-day workshops are held cooperatively with the Tulsa and Oklahoma City Geological societies. Informal feedback from participants indicates they are developing reserves from applying concepts learned from these workshops.

The Hunton play, where de-watering concepts are being applied, represents just one of the plays. Applying de-watering concepts, significant oil and gas reserves are being produced from areas previously thought unprofitable. New Dominion LLC, a primary party in Hunton de-watering, describes the process in information on their website http://www.newdominion.net/NewsReleases.html

PTTC's Involvement in the Technology Adoption Process
OGS performed a comprehensive Hunton play study, providing a professional publication and working through PTTC to conduct four Hunton workshops in late 2000. These workshops drew 271 participants, 230 of whom were from industry. Two subsequent field trips occurred in May 2001. About 2 ½ years later in May 2003, PTTC made follow-up calls to industry participants.

PTTC contacted 57 industry participants, representing **a 25% random sampling**, and asked them if they had developed new Hunton production. This group alone indicated that there had been **26 new wells drilled and eight re-completions**. Additional new wells were in progress or planned.

Economic Benefits From Hunton Development (workshop participants alone)

Reserve/cost data (confirmed by major Hunton producer)

New well:	$425,000	750 MMCF plus 10 Mbbls
Recompletion:	$125,000	275 MMCF plus 5 Mbbls

New reserves:

From 25% sampling	**22.5 BCF gas plus 300,000 bbls**
All participants (fourfold)	**90 BCF gas plus 1.2 million Bbls**

Value to vendor community:

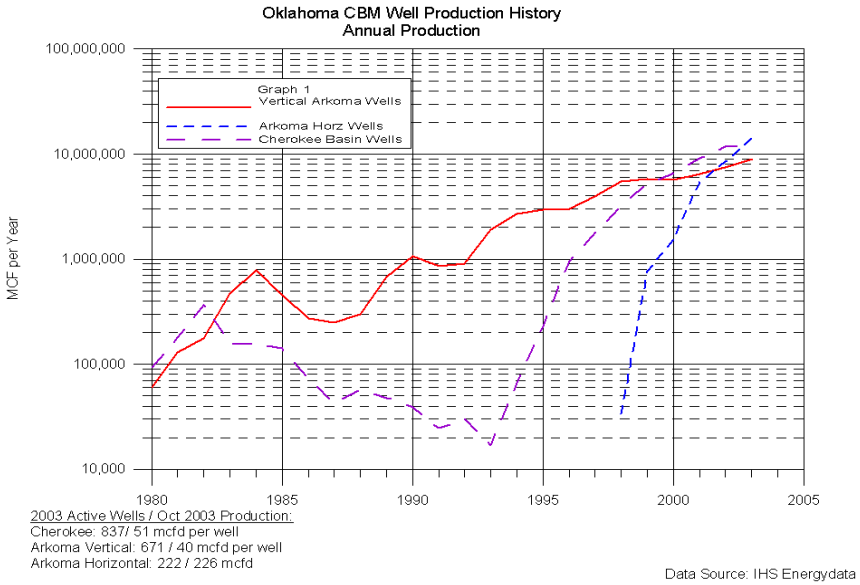
From 25% sampling	**$12 million**
All participants (fourfold)	**$48 million**

Published Case Study: "Major Reserve Increase Obtained By De-watering High-Water Saturation Reservoirs," *World Oil*, December 2003, http://www.newdominion.net/NewsReleases.html

OGS Play Report: Hunton Play in Oklahoma, SP 200-2 (Phone 405-360-2886)

Coalbed Methane Development in Oklahoma

Although occurring through the 1980s, Oklahoma coalbed methane (CBM) production did not really take off until the early 1990s. CBM production comes from both the Arkoma and Cherokee (northeast Oklahoma) basins. The Arkoma Basin CBM play now contains some 600 vertical wells and 180 horizontal completions. Production from each is now around 10 BCF/yr, but horizontal production is growing more rapidly as more higher deliverability horizontal completions are added. In the Cherokee Basin, which is similar to that in southeast Kansas's portion of the Cherokee Basin, production from about 850 vertical wells now exceeds l0 BCF/yr. Well count, reserve and cost data used in the economic benefit analysis were gleaned from information presented in spring 2004 workshop.



PTTC's Involvement in the Technology Adoption Process

The CBM production curve indicates that Oklahoma CBM activity began taking off as early as mid-1995. The Oklahoma Geological Survey (OGS) gathered data, presenting the first CBM workshop through PTTC in late 1999. It drew 191 participants. Four additional workshops in the next two years, drawing from 60 to 100 attendees each, fed evolving information to industry. Field trips in 2001, major workshops in 2002 and 2004, and a CBM website developed by OGS passed on lessons learned/best practices as they continued to develop. Staff is active within the CBM community, and is working with industry to develop a regional "CBM meeting" in fall 2004 in Tulsa.

Economic Benefits From CBM Development in Oklahoma

Incremental reserves:

Cherokee Basin vertical:	850 wells x 200 MMCF/well	**170 BCF**
Arkoma Basin vertical:	600 wells x 300 MMCF/well	**180 BCF**
Arkoma Basin horizontal:	180 wells x 600 MMCF/well	**108 BCF**

Value to vendor community:

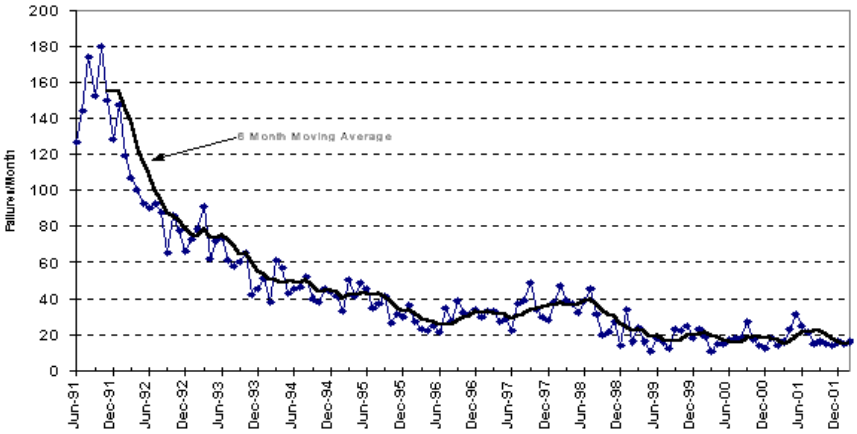
Cherokee Basin vertical:	850 wells x $60,000/well	**$51 million**
Arkoma Basin vertical:	600 wells x $80,000/well	**$48 million**
Arkoma Basin vertical:	180 wells x $300,000/well	**$54 million**

Online CBM Statistics & Well Data: http://www.ogs.ou.edu/fossilfuels/coal.htm

Unconventional Energy in The Southern Midcontinent: http://www.pttc.org/news/1qtr2004/v10n1p7.htm
Summary of a major two-day conference that drew 345 participants, a large portion of program related to CBM.

Wellbore Management In The Permian Basin

Wellbore management refers to the concept of paying attention to the total wellbore system (rods, tubing, pumping unit, chemical program, lifting conditions) and involving all relevant staff in a team effort to realize significant reductions in well failure frequency. Field data must be gathered, thoroughly analyzed, remedial work done, and post-work performance evaluated. Accurate and complete records must be maintained. Doing this and learning from field experience, experience in several projects reveals that failure frequency can be reduced 10-fold or more. Reducing failure frequency to as low as 0.25 failures/well/year (i.e., 4 years between a failure) has been proven to be definitely achievable. With fewer failures, operating costs are reduced dramatically. Beyond reduced operating costs, there is minor revenue gain from less production loss due to down time with fewer wellbore failures.



Ten-fold reductions in failure frequency proven

50% reductions in operating costs proven

PTTC's Involvement in the Technology Adoption Process

An initial wellbore management workshop was held in Midland, Texas in March 2001. Additional workshops were held in Amarillo and Tyler, Texas and Artesia, New Mexico during 2002. Technology insights were incorporated in a "Produced Water & Associated Issues" manual developed for PTTC. This manual was the basis for 8 workshops in Oklahoma/Arkansas during 2003. Workshops have been held in other PTTC regions, and the effort continues.

Economic Benefits From Wellbore Management in The Permian Basin

There are some 100,000 producing wells in the Permian Basin and, conservatively, one-third are being "wellbore managed." Initial costs to rework/equip wells can range from $7,000 to $30,000 ($15,000 average used). Incurred at the start, these costs are not reincurred for several years when wellbore management practices are followed. Experience indicates that costs payout within about two-thirds of a year. Cost for the average failure/pulling job is estimated at $9,000. Cost estimates consider information provided by operator of major Permian Basin waterflood where wellbore management is being practiced.

Reduced operating cost: 33,333 wells x (2.5 – 0.25 failures/well/yr) x $9,000 **$675 million/yr**
Production increase: 2.25 fail./yr x 5 bopd/well x 3 days/fail. x 33,333 wells **1.12 million bbls/yr**
Producer value for 3-year period since PTTC began tech transfer ($2.03 billion plus 3.36 million bbls)
Vendor value (initial operator investment in wellbore mgmnt) 33,333 wells x $15,000 **$500 million**

Above calculates the benefits from the Permian Basin alone. Wellbore management insights have actually been transferred across the country through PTTC efforts and producers across the U.S. are saving money.

Supporting References

1. Workshop summary posted online, "Wellbore Management," March 22, 2001 in Midland, Texas.

2. Case studies in *World Oil* (circ. 35,000+): "Wellbore Management, The Producing Well Improvement Process," June 2002; "Polylined Tubing Reduces Downhole Failures," Jan 2003: "Focused Well Failure Reduction Program Realizes Cost Savings, Other Benefits," April 2004.
3. Concise manual, "Produced Water and Associated Issues," Jan 2003. Basis for workshops in Oklahoma and other states. Also available online http://www.pttc.org/pwm/produced_water.htm

University, Student Program Impact

The PTTC outreach program is industry directed and regionally focused with a goal of assisting producers to reduce costs, improve operating efficiency, increase ultimate recovery, enhance environmental compliance and add new reserves. This heart of the technology transfer is run through the 12 regional and satellite offices, which are tied into State Universities and/or Geological Surveys. Federal dollars have been matched with state dollars, as well as industry contributions, to form a unique partnership. In several ways, from undergraduate through PhD, students are involved in DOE-supported and PTTC projects within the university environment. Putting University faculty, staff and students together with industry has a wide reaching positive impact on the domestic oil and natural gas industry employment picture.

Appalachian:
The Appalachian Region is coordinated with West Virginia University (WVU). The Director for this region is Dr. Douglas Patchen, who is also Chief Geologist of the West Virginia Geological and Economic Survey and Director of the Resource Extraction Division of the National Research Center for Coal and Energy (NRCCE) at West Virginia University. One of his prime responsibilities at NRCCE is to direct the activities of the Appalachian Oil and Natural Gas Research Consortium (AONGRC), a partnership among the geological surveys of West Virginia, Kentucky, Ohio and Pennsylvania, and the departments of Geology & Geography and Petroleum & Natural Gas Engineering at WVU. This consortium serves as the Regional Lead Organization charged with implementation of the PTTC program in the 7-state Appalachian region.

Central Gulf:
The Central Gulf Region is coordinated with the Center of Energy Studies at Louisiana State University (LSU). The Director for this region is Bob Baumann, who began his career working on environmental issues at LSU's Center for Wetland Resources and has been with the Center for Energy Studies since its formation in 1982. In 1988, Mr. Baumann became executive director, serving in that capacity through December 1995. He now serves as special assistant to the provost of the University and as a senior fellow at the Center for Energy Studies. Mr. Baumann is the author of more than 40 articles on energy and environmental topics.

Eastern Gulf:
The Eastern Gulf Region is coordinated with The University of Alabama. The Director for this region is Dr. Ernest Mancini, who is also a Professor of Geology in the Department of Geosciences and Director of the Center of Sedimentary Basin Studies at the University of Alabama. He teaches graduate courses in sedimentary basin analysis, petroleum system, and sequence stratigraphy and conducts research in petroleum reservoir characterization and modeling. Dr. Mancini has received 11 grants involving 17 participating faculty members, 3 participating research scientists, 16 grad students and 20 participating organizations. Through PTTC workshops, grad students present project results and gain access to producers who eventually hire them into industry positions upon graduation.

Midwest:
The Midwest Region is coordinated with the Illinois State Geological Survey (ISGS). The Director for this region is Dr. David Morse, who is a petroleum geologist with the ISGS. He is responsible for conducting technology transfer activities, reservoir characterization studies and 3-D models of oil and gas storage fields, evaluating source rock potential, and for coordinating field acquisition and analysis of Illinois coal cores for coalbed methane assessment. On average, the survey employs 5-7 students (PhD, MS, & undergraduate) who acquire and organize data, contribute to DOE-related research, and develop GIS and mapping products, which are featured in PTTC tech transfer. Although Illinois is not known as an oil state, about 15% of these hourly students and interns go on to careers in the oil and gas industry. A successful PTTC satellite office is managed by Dr. William Harrison, geology professor at Western Michigan University. His research interests are directed towards the predominant reservoirs in the mature Michigan Basin, with a focus on paleontology, stratigraphy and depositional facies. He has a strong interest in horizontal drilling and improved oil recovery

processes and has been integral to several DOE-supported R&D projects in the Michigan Basin. He is directly involved with 5 to 14 students per year who assist with the DOE R&D projects and the Michigan Core Lab, which he also manages. As a result of this experience, at least 30% of the students go into oil and gas careers.

North Midcontinent:
The North Mid-continent Region is coordinated with the Kansas University Energy Research Center. The Director for this region is Rodney Reynolds, who is also a petroleum engineer with the Tertiary Oil Recovery Project at the University of Kansas (TORP). Reynolds is responsible for conducting technology transfer activities, reservoir evaluations, reservoir computer simulations, economic analyses, and design and field-testing of enhanced oil recovery projects. He is also responsible for managing field demonstration projects and liaison activities to assist oil and gas operators. DOE-supported research projects at TORP and the Kansas Geological Survey, which also assists in PTTC activities. Within TORP, there are on average 8 to 10 grad students at any one time, about 75% masters and 25% PhD. Nearly all go to work in the O&G industry upon graduation with about 50% entering the domestic market. Employers include majors, large service companies and consulting companies.

Rocky Mountain:
The Rocky Mountain Region is coordinated with the Colorado School of Mines. The Director for this region is Dr. Sandra Mark, who is also a Research Assistant Professor at the Colorado School of Mines. Federal dollars support selected research projects in several departments, each typically involving grad students. The PTTC program itself employs a student as the regional webmaster. Since 1996, Dr. Mark has been responsible for implementing over 123 PTTC technical workshops and software training courses that have reached over 4,660 people. The Rocky Mountain Region has established a program titled “Futures in Energy,” an oil and gas industry outreach program that provides talented high school juniors and seniors, and motivated high school teachers with scholarships to an oil and gas technology training program. The five-day interactive training program focuses on oil and gas exploration and technology, and includes a field trip to visit actual oil field operations. Activity reports from 2002 interns indicate that these interns performed meaningful work that benefited industry sponsors and left students with a positive impression of the oil and gas industry.

South Midcontinent:
The South Mid-continent Region is coordinated with the Oklahoma Geological Survey at the University Oklahoma. The Director for this Region is Dr. Charles Mankin, who is also director of the Oklahoma Geological Survey and Sarkey’s Energy Center. Students participate in activities and the region organizes student job fairs to connect industry with potential employees.

Southwest:
The Southwest Region is coordinated with the Petroleum Recovery Research Center (PRRC) at the New Mexico Institute of Mining and Technology. The Director for this region is Dr. Robert Lee, who is also an Associate Professor in the Petroleum & Chemical Engineering (P&ChE) department. His specialty lies in the study of natural gas, and his research interests center on studying problems associated with water coning, water channeling, hydrates, stress-dependent permeability, high-velocity gas flow, produced water purification, and others. Research within PRRC, much of it DOE-supported, supports 25-30 grad students (2/3 PhD, 1/3 MS) at any point in time. The majority of these grad students are ultimately employed in the oil and gas industry, most in the international arena. Of the above, the PTTC effort employs a couple grad students primarily in the web/database/GIS area, plus a few undergraduate hourly students.

Texas Region:
The Texas Region is coordinated with the Bureau of Economic Geology (BEG) at the University of Texas (UT). The Director for this Region is Dr. Scott Tinker, who is also the State Geologist of Texas and a Professor in UT’s Department of Geological Sciences. BEG conducts multi-disciplinary, oil- and natural gas-oriented research projects for domestic and international clients. Funding for research comes from several

sources, including about 20% from federal funding in FY03. Overall research supports about 15 students. None are directly involved in day-to-day PTTC activities. A successful satellite office in the Permian Basin has been directed by Robert Kiker in the Center for Energy and Economic Diversification **(CEED**) within the University of Texas Permian Basin system. The focus in the Permian is operational issues affecting mature basins for enhanced oil recovery.

West Coast:
The West Coast Region is coordinated with the Petroleum Engineering Program at the University of Southern California (USC). The Director for this region is Dr. Iraj Ershaghi, who is also Omar B. Milligan Professor of Petroleum Engineering and the Director of the Petroleum Engineering Program at USC. USC was integrally involved in some DOE Reservoir Class Projects beginning in the mid 1990s. During that involvement, project work supported both MS and PhD grad students. Some students continued to work in the projects on a post-doc basis. Students go on to work in the oil and gas industry, primarily for majors but occasionally with independents or for themselves as consultants. Dr. Ershaghi also started COMET (California Oil Mentoring Entrepreneurial Training), which is an oil and gas industry outreach program sponsored by public and private organizations and individuals that combines oil and gas industry expertise with a high school science-mentoring program designed for selected high school science teachers, and up to thirty talented high school junior students interested in exploring entrepreneurial opportunities and a career in energy-related industries. Computer, energy and environmental technologies represent a large segment of California's leading trade exports. Small businesses account for one of the fastest growing sectors in California's business economy. As small producers operate more and more of California's oil fields, California seeks oil industry entrepreneurs for the future. Nurturing the students of today to become energy employees and entrepreneurs of tomorrow is essential to California's economic vitality. COMET provides a practical roadway for high school students to explore a career in energy. Fellowship opportunities for participating students who pursue careers in the energy and petroleum field exist. Since its inception, the program has trained 172 students and 25 teachers. More than 320 students have attended PTTC workshops since 1996.

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