



**ADDITIONAL SEPTEMBER MEETING INFORMATION**



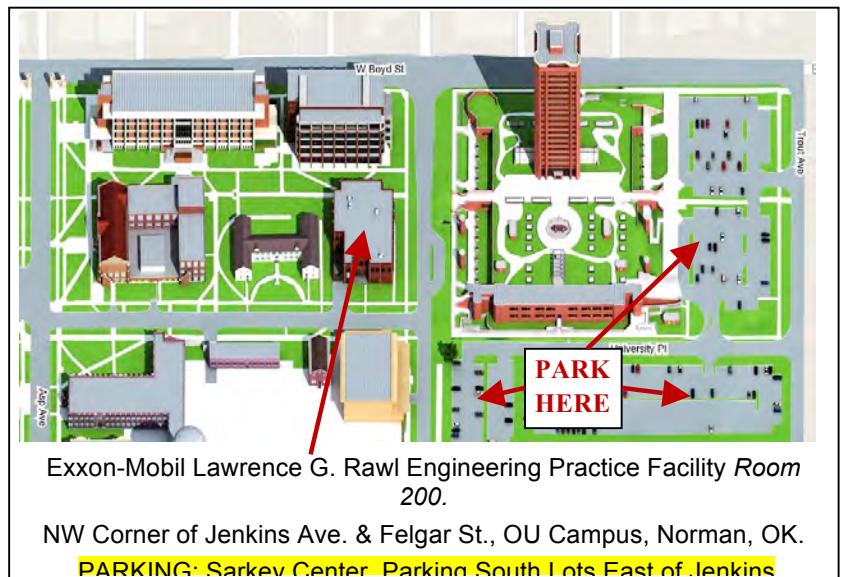
Dr. James J. (Jim) Sluss is the Morris R. Pitman Professor in the School of Electrical and Computer Engineering and the Senior Associate Dean in the College of Engineering. He received the B.S in Physics in 1984 from Marshall University, and the M.S. and Ph.D. in Electrical Engineering in 1986 and 1989, respectively, from the University of Virginia.

His current research and teaching interests are in the areas of optical communications, photonics, and intelligent transportation systems. He has been awarded seven U.S. patents, has authored/co-authored numerous journal and conference publications, and has been principal/co-principal investigator on over \$11 million in sponsored research grants and contracts.

He is a member of the Institute of Electrical and Electronics Engineers (IEEE), IEEE Education Society, IEEE Communications Society, Optical Society of America (OSA), International Society for Optical Engineering (SPIE), and American Society of Engineering Educators (ASEE). He presently serves as Treasurer of the IEEE Education Society.

This meeting will also be attended by members of the Society of Women Engineers (SWE).

*WHEN MAKING RESERVATIONS, PLEASE FURNISH YOUR NAME, YOUR PROFESSIONAL SOCIETY (ASME, SWE, IEEE, ETC), OR SCHOOL/UNIVERSITY IF YOU ARE A STUDENT. IF YOU ARE A P.E., PLEASE INDICATE IF YOU WOULD LIKE A PDH CERTIFICATE.*



Dear ASME Members,

You should have received your 2014 - 2015 Membership renewal notice in the mail. This notice also serves as an opportunity for you to manage your professional profile, join ASME interest groups, and update your contact information.

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ASME Membership gives you the tools, professional training, information and connections you need to succeed in your career. We look forward to your continued loyalty to ASME, your professional society. Please renew your membership today.

## NEWS ITEMS OF INTEREST

### **Engineering - A Career that Pays: *Survey shows Engineers' Salaries Increased in 2013***

(courtesy: <https://www.asme.org/about-asme/news/press-releases/engineering-a-career-that-pays>)

**New York, Jan. 29, 2014** – There is good news on the employment front for engineers in the United States: salaries for engineers are rising amid the growing global demand for technology services across industry sectors, particularly healthcare and energy.

According to the latest Engineering Income and Salary Survey conducted by the American Society of Mechanical Engineers (ASME) and the American Society of Civil Engineers (ASCE), the average total annual income for engineers in 2013, including bonuses, was \$104,303, nearly 0.8% higher than the previous year and almost 4.5% more than the \$99,738 salary figure reported in 2011.

“Salaries for engineers have increased at a time when other professions have struggled through challenging economic conditions,” said Madiha El Mehelmy Kotb, president of ASME. “The demand for engineers continues to grow, and many stimulating job opportunities are emerging.”

Many of these job opportunities, according to the salary survey, are in the ocean engineering and petroleum fields, where the median income in 2013 was, respectively, \$137,763 and \$130,000. Other sectors showing good salaries include computer services (\$124,000), nuclear energy (\$119,000), and fire protection (\$123,000).

Based on input from 10,627 engineers in the U.S., the 2013 salary survey revealed other findings and trends, including:

- The median income of full-time salaried engineers increased from \$55,000 for recent graduates to \$130,000 for those with 25 or more years of experience or more.
- About 1,900 engineers in the survey – or 17.8 percent – received promotions in 2013.
- Full-time salaried engineers holding doctoral degrees in engineering have a median income of \$118,000, while those with an M.S. earn a median of \$95,000 and those with a B.S. show a median income of \$85,276.
- Engineers in the Pacific Southwest took home the highest median salary of \$110,000 relative to other regions in the country.

“It is an exciting time to be an engineer,” said Kotb. “As the world’s population increases, so will the demands on the next generation of engineers to provide solutions to global challenges. Mechanical engineers will be at the forefront of solving these problems.”

### **DOE Announces Initiative to Modernize Natural Gas Transmission & Distribution Infrastructure**

(courtesy: <https://www.asme.org/about-asme/get-involved/advocacy-government-relations/policy-publications/capitol-update/august-1-2014-capitol-update>)

The Department of Energy (DOE) has announced several new initiatives aimed at enhancing existing programs to modernize infrastructure and reduce methane emissions through improved standards, infrastructure investment incentives, and innovative research to advance the state of the art in natural gas system performance. These initiatives include:

- Efficiency Standards for Natural Gas Compressors. Today, DOE will take the first step toward establishing energy efficiency standards for new natural gas compressor units by issuing a Request for Information. Gas compressor units are estimated to consume over 7 percent of natural gas end use in this country, and improved efficiency will provide meaningful energy savings and reductions in greenhouse gas emissions.
- Incentives for Modernization of Natural Gas Transmission System Infrastructure. The Secretary of Energy is recommending that the Federal Energy Regulatory Commission (FERC) explore efforts to provide greater certainty for cost recovery for new investment in modernization of natural gas transmission infrastructure, as part of FERC’s work to ensure just and reasonable natural gas pipeline transportation rates. These efforts may include consideration of a cost recovery mechanism for gas transmission companies who perform upgrades to enhance the safe and reliable operation of the pipeline.

- **Advanced Natural Gas System Manufacturing R&D Initiative.** DOE is launching a collaborative effort with industry with the goal of establishing an Advanced Natural Gas System Manufacturing R&D initiative. The initiative will evaluate and scope high-impact manufacturing research and development to improve natural gas system efficiency and reduce leaks. This will include a formal Request for Information, public workshops, and technical analysis and will leverage technology development areas already in progress through the Administration's Advanced Manufacturing Partnership (AMP 2.0), including Advanced Sensors, Control, and Platforms for Manufacturing; Advanced Materials Manufacturing; and Advanced Reciprocating Engine Systems.
- **Pipeline Efficiency Research, Development and Demonstration Program.** DOE is proposing to establish a new "First Things First" natural gas infrastructure technology program to enhance pipeline and distribution system operational efficiency and reduce methane emissions. The goal of the program is to drive research and technology development to improve identification of methane leaks, for example, by developing smart sensor technologies that collect and communicate data on a variety of operational parameters such as operating pressure and flow rates.
- **Providing Loan Guarantees for New Reduction Technologies.** Advanced Fossil Energy Projects that Reduce Methane Emissions. DOE will conduct outreach to industries in the advanced fossil sector and other stakeholders to increase awareness of the \$8 billion solicitation that DOE issued in December 2013 to provide loan guarantees to spur commercialization of innovative technologies that reduce methane emissions from gas transmission and distribution systems. This includes, but is not limited to, projects involving new wellhead drilling technology, flare reduction, methane capture and collection, or reducing methane leakage from pipelines and distribution networks.
- **Investing in Technologies for Leak Detection and Measurement.** DOE's efforts will build on the methane sensing initiative underway at ARPA-E, which on April 29, 2014, released a funding opportunity announcement for up to \$30 million for the Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR) program. This program seeks to fund disruptive technologies for low-cost, highly sensitive systems for the detection and measurement of methane associated with the production and transportation of oil and natural gas.
- **Quadrennial Energy Review.** DOE will continue to conduct analysis and engage with stakeholders and the public through meetings for the Quadrennial Energy Review (QER). Two recent QER meetings in Pittsburgh and Denver focused in part on natural gas transmission and distribution systems and the need for modernization. These meetings are engaging stakeholders and the public in the development of the first installment of the QER, which focuses specifically on energy transmission, storage, and distribution infrastructure. This QER will include analysis to estimate the job creation from manufacturing, and installing and maintaining equipment associated with reducing natural gas system leakage through a specific set of best practices.

Additional information is available at:

<http://energy.gov/articles/factsheet-initiative-help-modernize-natural-gas-transmission-and-distribution>

### ***Beyond the Headlines: Earthquakes: Should We Be Worried?***

**Vikram Rao**, Executive Director, Research Triangle Energy Consortium

(courtesy: <http://www.spe.org/jpt/article/7134-beyond-the-headlines-earthquakes-should-we-be-worried>)

Can activities related to shale oil and gas production cause earthquakes? Yes. Can these be avoided? Yes, again.

In discussing this, we first need to break the issue down into two buckets. One is the hydraulic fracturing of rock as a method of stimulation. This is necessary because the reservoir being accessed has very low permeability, which is the rock property that allows flow of fluids. Fracturing causes artificial permeability that enables the oil or gas to flow. The second bucket is the injection of wastewater from production operations into rock as a means of disposal. These two operations are quite different as potential contributors to earthquake activity.

**The Basics:** Earthquakes are generated when there is Earth movement in a fault. A fault is a fracture in the Earth with significant displacement of the rock on either side of the fracture. To cause movement, the human activity would

need to pour energy into what is known as an active fault. This is a fault which, when energized, will cause Earth movement. According to the US Geological Survey, the magnitude of an earthquake will be directly proportional to the length of the active fault.

Faults can be detected. Modern 3D seismic imaging can identify the location and lengths of all but the smallest faults. Small faults are not a concern as a source of damaging earthquakes. So the remedy in large part lies in performing these surveys before a fracturing or wastewater disposal operation.

**Hydraulic Fracturing:** Seismic activity directly associated with stimulation operations has been studied extensively. Thousands of fracturing events have been observed using a technique known as microseismic monitoring. As the name implies, the seismic events are expected to be small compared with earthquakes. The monitoring was originally done to make operations more efficient. It is in the interest of the operator to direct the fracturing energy into the oil or gas bearing layer. Properly designed operations achieve this. The monitoring has shown that the vast majority of fracturing operations generate low intensities, well below 1.0 on the Richter scale. A handful of instances of higher levels of seismic activity have been documented (out of hundreds of thousands of wells fractured over the past 50 years). For example, an event of 2.5 was observed in the United Kingdom. Although this has not been fully explained, it is believed to have been associated with a proximal active fault. This appears to be the case for most of the other known instances as well. Virtually all oil and gas operations conduct 3D seismic monitoring prior to planning the wells. Faults can be, and ought to be, identified and avoided.

**Water Disposal Wells:** Fracturing fluids returning to the surface usually contain high concentrations of salt and must be disposed of safely. One method is to inject them into what the US Environmental Protection Agency classifies as UIC Class II wells. The water is sequestered in deep formations, preferably porous bodies such as saline aquifers. There is little doubt that some of these wells are implicated in felt earthquakes in Arkansas, Ohio, Texas, and Oklahoma. A few have been of a magnitude up to 5.2. In Arkansas, as well as in Ohio, when the injections were stopped, seismic activity was reduced or stopped. Even smaller earthquakes not causing damage are worrisome for people who have never experienced one. Remedies must be sought and, fortunately, these are available.

The simplest remedy is to just not do it! While somewhat tongue in cheek, this is largely possible by reusing flowback water. Technology now allows for highly saline fluids to be used in fracturing fluid. Consequently, the treatment for reuse can be very economical. In states such as Pennsylvania, where the geology is not suited for disposal wells, this is happening routinely. But even if this were done on a wide scale, disposal would be required at the cessation of all operations. But now the volumes will be substantially less.

Before the design of the disposal well, a seismic survey ought to be conducted and the well not be placed proximal to an active fault. The cost of such a survey would be a fraction of the total well cost. Another approach, with a somewhat higher associated cost, would be to place microseismic monitoring stations at least during the early stages of injection. Injecting liquid into most formations will produce stress. The microseismic monitoring will help to identify a threshold injection rate that will prevent seismic activity. The tools for accomplishing this are readily available.

Earthquakes are very unlikely to be caused directly by fracturing operations, where injection operations typically last a few hours to days. Wastewater disposal wells pose a greater concern because of higher volumes and ongoing injection. However, if wastewater disposal wells are properly designed and placed, the potential for earthquakes is quite small. Keep in mind that there currently are more than 150,000 disposal wells in the US alone. Very few of them are causing incidents. With care, even these can be avoided.

**Takeaways:**

- Earthquakes are generated when there is Earth movement in a fault
- Seismic imaging can identify all but the smallest faults
- Earthquakes are very unlikely to be caused directly by fracturing operations
- Improperly designed and/or placed wastewater disposal wells can produce earthquake activity.

**P.E. Exam Application Deadlines**

<http://www.ok.gov/pels/documents/Exam%20Dates%20and%20App%20Deadlines.pdf>

**Fall Examination Application Deadline Is Past**

**Spring Examination Date Application Deadline Below**

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**P.E. Examinations:** Agricultural and Biological, Architectural, Chemical, Civil, Electrical and Computer, Environmental, Industrial, Mechanical, Naval Architecture and Marine Engineering, Software and 8- hour Structural Component - Vertical Forces.,

**Exam Details:** Exam Date: April 17, 2015, Registration Deadline: December 1, 2014 (January. 5, 2015 deadline for Fall Graduates)

**Future ASME-Central Oklahoma Section Events**

<b>Date</b>	<b>Location</b>	<b>Program Topic and Speaker</b>
Thursday September 25, 2014	OU L.G. Rawl Engineering Practice Facility Norman, OK	Topic: “A New 5-Year Strategic Plan for the OU College of Engineering”  Speaker: Dr. Jim Sluss, Sr. Associate Dean, Univ. of Okla. College of Engineering
Thursday Oct. 25, 2014	TBD	Program and Speaker TBD
Thursday Febr. 26, 2015	OC Gaylord Student Center, Edmond OK	Joint Engineering Societies Banquet

**Please visit our Section website:**

[https://community.asme.org/central\\_oklahoma\\_section/default.aspx](https://community.asme.org/central_oklahoma_section/default.aspx)

**IT'S BEEN REVAMPED.** Check event updates and other useful information!