

Montana Society of Engineers

A state society of the National Society of Professional Engineers



Founded 1887

What is MSE?

Dan Munson, PE, President

As the new president for the state society of MSE, I had to sit down the other day and ask myself; "Who are we? What do we stand for? Why do we belong to the Montana Society of Engineers?"

These questions can be answered in a general sense by looking at our affiliated NSPE mission, value and goal statements.

Mission

- We are a society of engineering professionals from all disciplines that promotes the ethical and competent practice of engineering, advocates licensure, and enhances the image and well-being of its members.

Values

- Protection of the public
- Ethical conduct
- Professionalism
- Competency
- Fulfillment of member needs
- Service to the public
- Licensure

Goals

- Promote the competent, ethical, and professional practice of engineering.
- Enhance the image and stature of engineering professionals.
- Provide education, career development, networking opportunities, and other benefits to engineering professionals and students.
- Advocate the interests of engineering professionals and protect the public through an effective government relations program.
- Align the structure, activities, and

governance of the Society to optimize support and resources for all programs.

So what does that really mean?

In Montana, your MSE officers have been busy

- Giving the engineering profession opportunities to grow, earning PDH's, by taking the lead in organizing the Joint Engineer's Conference
- Keeping abreast of rulemaking and legislative changes that affect our profession
- Continue promoting and administering the MATHCOUNTS program in the state for our aspiring middle school engineering hopefuls
- Promote the various Engineering Outreach programs that touch our communities

What are our **goals** for the coming year?

- We are planning on unveiling a MSE website where job postings, RFP's, information, and topics of interest will be available to our members
- We want to keep close tabs on the 2005 Montana legislative session to watch for any bills that may adversely affect our profession
- Continue providing great educational opportunities with the JEC, MATHCOUNTS, and the Outreach programs

So, that's who we are, what we stand for, and why we belong to MSE. If any of these causes interest your passion, we need your partnership. Contact any of the MSE officers to find out how you can help enhance our Montana Engineering profession's values and image. We promise to do our part!

September, 2004

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Bits and Pieces

Sandra S. Anderson, PE, Secretary/Treasurer
A wee smattering to prove that engineers really are interesting people!

Ka-Boom!

Overheard after the first *Charlie's Angels* movie: "They should have had fewer fights and blown more stuff up." If you agree, you will enjoy www.implosionworld.com, a Web site that covers the demolition industry with news articles, reminiscences, and profiles of recent projects, world records (largest, tallest, longest, most structures at once), and "blasts from the past".

There are also step-by-step reports of jobs such as the demolition of Space Launch Complex 41 at the Kennedy Space Center. The on-line shop offers T-shirts with the site's logo and a falling building, a new "implosion-like" demolition toy, the *What A Blast* documentary series, a lithograph of the world's largest building implosion, and a free downloadable screen saver.

The Cinema Explosif link leads to 26 movies of demolition projects, and the TV & Exhibitions link lists upcoming events. As can be seen from the methods used to make a Welsh smokestack surrounded by buildings fall nearly vertically, the least visually impressive projects can be the toughest. An optional feature allows you to enter your e-mail address, and they will send you info on site updates and future live events.

Look, Ma, No Tubes

The first transistor radio was introduced 50 years ago this fall, on October 18, 1954. The Regency TR1, produced jointly by Texas Instruments and Industrial Development Engineering Associates, used transistors made of germanium.

The process of making transistors was so difficult at the outset that it worked only about a twentieth of the time. Finding parts to fit inside the case required innovation for almost every component. The first run of 1500 radios quickly sold out at \$10 per set. Over the next year, Regency produced at least 100,000 TR1s and TI made half as many transistors for that radio alone as had previously been made by the whole industry.

Today, a single Intel P4 microprocessor chip has about 125 million transistors, several

hundred times that 1955 output. Walter Brattain, one of the transistor's inventors, once observed, "Even the loneliest nomad on the steppes of Asia can have the news of the world by twisting a dial. He doesn't have to read. Once the common man has a chance to learn what is going on, he has a chance to control his destiny."

Fueled by...

Back in the *Sputnik* era, the Raymond Engineering Laboratories (Middletown, Connecticut) received a contract to design and build explosively erected antennas for the Mercury, and later Gemini, spacecraft. A set of telescoping aluminum tubes with flared ends were stored in a small, foot-deep cylindrical cavity in the top of the craft. At flight's end, after the craft landed in the ocean, an astronaut would trigger an explosive charge in the base of the telescope. This would set up a six-foot rigid antenna he could use to contact the ships waiting to rescue him. Creating just the right explosive force was tricky: too little charge meant the sections of the telescope would fail to lock together; too much charge would blow the apparatus apart.

Success came when Paul Eldridge, the explosives man, brought in a small rocket-powered race car he had bought at a toy store. The toy's "rocket powder" worked perfectly. The toy's manufacturer revealed that the explosive powder was bat guano from South America. It was used in all the Mercury and Gemini antennas. NASA, recognizing the difficulty of finding an acceptable substitute, is said to have prepared a federal specification for it.

An Ode to the Railroad (and maybe a little ESP about the Internet?)

By Walt Whitman, in the mid-1800's
Lo, soul! seest thou not God's purpose from the first?

The earth to be spann'd, connected by net-work,
The people to become brothers and sisters,
The races, neighbors, to marry and be given in marriage,
The oceans to be cross'd, the distant brought near
The lands to be welded together.

A wee smattering to prove that engineers really are interesting people!

Register you and your colleagues for one low price at www.nspe.org/education

NSPE Affordable Online Seminars

LIVE!!! ONLINE

Essentials of Sustainable Design:

Engineers are at the forefront of sustainable design to develop new techniques and technologies to make buildings environmentally sound and energy efficient. Join NSPE for these live, online seminars that address fundamental issues of sustainable design:

September 30: Energy

October 7: Materials

October 21: Indoor Environmental Quality

November 4: Construction & Delivery

November 18: Post Occupancy Process

Seminars are from 12:30—2:00 p.m. eastern time. Participants earn 1.5 CE/PDH credits for each seminar. Register you and your colleagues for one low price at www.nspe.org/education.

Special Thanks to the 2003-04 Corporate MATHCOUNTS Sponsors!

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Montana MATHCOUNTS
*Corporate Sponsors are
making a difference!*

Through the financial support of these corporate companies, Montana MATHCOUNTS has been able to continue to grow and reach more students in Montana. These students are introduced to the wonderful world of mathematics and are able to take advantage of these skills at an earlier level making their future and ours brighter. THANK YOU!

Attend the Joint Engineers Conference!

Doug Brekke, PE, Immediate Past President

The 2004 Joint Engineers Conference will be held November 3, 4 and 5 at the Red Lion Colonial Hotel in Helena. The conference features continuing education, a trade show, and board meetings for the sponsoring societies.

The Joint Engineers Conference is an ideal opportunity to obtain the continuing education credits required for Professional Engineers license renewal. The three-day conference provides 21.5 continuing education hours. Everyone with an interest in engineering related topics is encouraged to attend. We especially encourage students and engineers in training to participate. MSE members are asked to encourage young engineers, contractors, and other design professionals to consider attending the Joint Engineers Conference.

MSE will meet at 4:30 p.m. on Thursday November 4. All MSE members are encouraged to attend.

The Joint Engineers Conference is jointly sponsored by MSE, ASCE, ITE, ASHRAE, IEEE, ACEC, and SAME. This year, we welcome three new sponsors: Intelligent Transportation Systems – Rocky Mountain Chapter (ITS RM), Structural Engineer's Association of Montana (SEAMT), and International Code Council - Montana Chapter (ICC). Session topics cover a broad range of

interests and disciplines. Topics will include the Structural Engineering Emergency Response Plan, Structural Wood Design, HVAC Control Systems, Efficient Lighting Systems, Funding Small Rural Infrastructure Projects, Seismic Analysis for Geotechnical Engineers, DEQ Water Quality Regulations, Advanced Transportation Technology, Trenchless Horizontal Drilling, Job Site Safety, and AutoCAD Productivity. We will feature project management engineers for The Woodrow Wilson Bridge Project near Washington, D.C. and the "Big Dig" project in Boston.

A special pre-conference program titled Increasing Human Effectiveness will be held on Wednesday—November 3. This seminar empowers people with tools to break through self-imposed limitations, resulting in greater productivity and a healthier bottom line.

MSE will sponsor the Montana Professional Engineers Hall of Fame Banquet on Friday November 5 at 5:30 p.m. Harold S. "Sonny" Hanson, P.E. will be inducted into the Hall of Fame. Sonny passed away on June 28, 2004 following an automobile accident.

The Burns Telecom Center at Montana State University handles promotion and registration for the Joint Engineers Conference. The phone number is 406-994-6683 and the email address is outreach@montana.edu.

***The 2004 Joint Engineers
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November 3, 4 and 5 at the
Red Lion Colonial Hotel in
Helena.***

Responsible Charge: Every PE's Obligation

*Excerpts By Jane Byrne
NSPE's Engineering Times Staff Writer*

In June, a Texas professional engineer received a formal reprimand and a \$1,680 fine from the state licensing board for sealing work that had not been done under his supervision. The engineer was fined for signing and affixing his seal to forms certifying that multiple windstorm inspections had been conducted by him or under his direct supervision. However, the inspections had not been completed by him or his employees.

Although responsible charge is clearly defined by state licensing boards, and ethical PE's know that direct control and supervision of work will keep them out of trouble, state licensing boards still regularly find violations, whether they are caused by ignorance of the law or by conscious breaking of the law. In doing their duty to serve and protect the public, professional engineers must be sure that they understand and follow state laws regarding the use of their engineering seals.

The NSPE Code of Ethics states that engineers may approve only documents that are in conformity with applicable standards and that engineers cannot sign any plans or documents dealing with an area in which the engineer is not competent. In addition, engineers may not sign "any plan or document not prepared under their direction and control."

The Code says that engineers may assume responsibility for an entire project and sign and seal the engineering documents for that project, "provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment." This wording is important because it specifies that each portion of the plans must be sealed by the PE who was in charge of the creation of that section. Review of plans alone is not enough.

But in general, for an engineer to have responsible charge over a project, he or she must be closely involved in the process from beginning to end. "They don't have to physically be in the room, but they need to be directly involved," NSPE's Board of Ethical Review William Lawson says. In addition, the responsible engineer needs to have appropriate procedures in place for communication in case issues arise that need to be addressed during the project.

Understanding the Law

To avoid any potential of even unwittingly breaking the law, PE's also need to have a strong understanding of the laws of the states they practice in.

"There has been a significant percentage of cases that are responsible charge or plan stamping that the engineer had no idea that what they were doing was wrong," says Andrew Ritter, executive director of the North Carolina Board of Examiners for Engineers and Surveyors.

For example, some engineers make the mistake of thinking that simply reviewing plans before sealing them is enough, Ritter explains. It's not. In fact, it's illegal. Even though the North Carolina board takes the engineer's intention into consideration, not knowing the rules is certainly not an excuse, he says.

"When disciplining, our board recognizes the difference between someone who made an honest mistake as opposed to someone who was selling their seal and knew what they were doing. We see quite a few cases where the engineer's response to the disciplinary case is, 'I had no idea I couldn't use my seal that way.' That doesn't make it any better, but we have heard that," he says.

Ritter's advice: "I tell engineers, 'You should really review the rules once or twice a year.' If they did, they would avoid a lot of trouble."

However, if engineers consciously take part in plan stamping, they will likely lose their licenses. "Selling your seal is one of the fastest ways to get your license revoked in North Carolina," Ritter says. In fact, more licenses are revoked for that reason than for all other violations combined, he adds.

In Montana

Montana Code Annotated 37-67-101 (10) states "Responsible charge" means direct charge and control and personal supervision either of engineering work or of land surveying. Only a professional engineer or a professional land surveyor may legally assume responsible charge under this chapter.

The Administrative Rules of Montana ARM 24.183.301 gives the DEFINITION OF RESPONSIBLE CHARGE FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS

The term "responsible charge" directly relates to the degree of control a licensee is required to maintain while exercising

Continued — Pg. 5

The NSPE Code of Ethics states that engineers may approve only documents that are in conformity with applicable standards and that engineers cannot sign any plans or documents dealing with an area in which the engineer is not competent.

Every PE's Obligation —Continued from Pg. 4

independent control and direction of engineering or land surveying work and to the decisions which can be made only under the direct supervision of a professional engineer or a professional land surveyor.

- (a) The degree of control necessary to be in responsible charge shall be such that the licensee:

(i) personally makes engineering or land surveying decisions, or reviews and approves proposed decisions prior to their implementation, including consideration of alternatives, whenever technical decisions are made. In making engineering or land surveying decisions, the licensee must be physically present or through the use of communication devices, can be available in a reasonable period of time; and

(ii) judges the qualifications of technical specialists and the validity and applicability of their recommendations before such recommendations are incorporated in the work.

- (b) To be considered in responsible charge of a project, the professional licensee who signs engineering or land surveying documents must be capable of answering questions asked by

equally qualified professionals. These questions would be relevant to the decisions made during the individual's participation in the project and require responses in sufficient detail to leave little question as to the licensee's technical knowledge of the work performed. It is not necessary to defend decisions as in an adversary situation, but only to demonstrate that the individual in responsible charge made the decisions and possessed sufficient knowledge of the project to make the decisions.

(i) examples of questions to be answered by the engineer could relate to criteria for design, methods of analysis, methods of manufacture and construction, selection of materials and systems, economics of alternate solutions, and environmental considerations. The individual should be able to clearly define the degree of control and how it is exercised within the organization and geographically and to demonstrate that the engineer is answerable within that degree of control.

A complete list of rules and laws for Montana can be found at http://data.opi.state.mt.us/bills/mca_toc/37_67.htm and <http://161.7.8.61/24/24-21001.htm>.

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Visit www.nspe.org TODAY!

***Joint Engineers Conference
will be in Helena, Montana on
November 3-5, 2004***

The JEC is jointly sponsored by MSE, ASCE, ITE, ASHRAE, IEEE, ACEC and SAME.

You will be able to earn 21.5 continuing education hours during this three-day conference. To register, call the Burns Telecom Center at Montana State University at 406-994-6683 or email:

outreach@montana.edu

For rooms, contact the Red Lion Colonial Hotel at 1-800-442-1002 under the room block for the JEC to receive a reduced room rate.

The MSE membership meeting will be held on Thursday—November 4, 2004 at 4:30 p.m. All MSE members are encouraged to attend. Stop by the MSE booth on Friday and say “Hello”.

**Make your plans to attend the
2004 JEC today!**

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21.5 continuing education
hours during this three-day
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