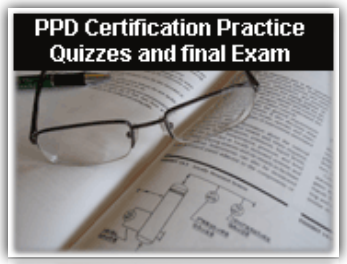
SPED Update

Join SPED, Renew Membership or Renew PPD Certification



This Issue's Highlights

3D Piping Models from Yesteryear

Waterhammer Prevention Tips

The Potential Pitfalls of Computer-Aided Pipe Design

Eastern Canada Offshore Development

New SPED Update Design

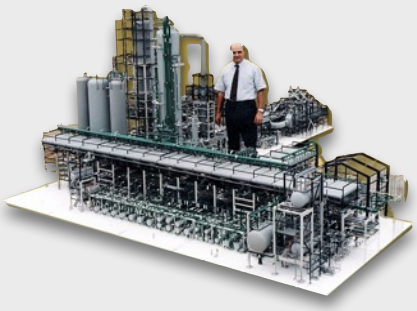
SPED Chapter Activity

PTP to Host Houston Chapter Meeting

Piping Technology & Products is hosting the Houston Chapter **Thursday, May 19, 2016**. PTP will make a presentation the state of the market for piping fabrication. Piping Tech will also precede the meeting with plant tours. See spedweb.com or CLICK HERE for more details. Come tour one of the largest fabrication facilities in the Houston Area and hear about new trends in the piping market. This activity counts for 1.5 PDUs.

If you are reading a printed version of this newsletter see spedweb.com/newsletter for the interactive version as well as past issues

Old-Fashioned 3D Piping Models



Over the long history of technical drawings, it has been necessary to depict designed objects in multiple views, simply because three dimensional things cannot be easily described in 2D space (such as on paper, backs of envelopes or cave walls). At minimum, usually two views of the object(s) are required; think of architectural house drawings which typically include floor plans as well as side views.

Using models, the general arrangement of the facility to be built can be easily conveyed without relying on multiple drawings and documents. Whether virtual (i.e., digital, using computer assisted design/drafting - CAD) or physical, one major advantage of engineering models over engineering drawings is ease of visualization.

Prior to the now ubiquitous use of 3D modelling software to generate engineering drawings for process plants, scale models were often constructed to assist for visualization of the designed facility. These models were generally built to 1/4"=12" scale and some completed plant models at this scale could easily fill a standard size ISO shipping container.

The components used to create these models were custom made by the engineering firm's model shop from balsa wood and acrylic, and ABS, as well as purchased as pre-manufactured butyrate moulded components (pipe fittings, valves, structural steel shapes, etc.) such as those available from a company called Plastruct. Many Plastruct components are also used by model railroad hobbyists to construct complex railway dioramas.

All equipment, piping and structures in the plastic process plant were color-coded according to process fluid service, mainly grey, red, yellow, green, white, black and

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SPED Calendar

Check the SPED Calendar at spedweb.com or CLICK HERE for news on upcoming SPED Events locally and worldwide

blue and were built to plastic design model specifications and procedures provided by engineering companies in order to standardize and control the workflow and presentation of the plastic model. Hand made sketches, fully dimensioned and annotated were made from the model and used for fabrication of pipe spools. After the model was completed in the office, it was shipped to the construction site where it was used as a reference to put fabrication spools together and to assist construction and installation planning.

The technicians building these scale models were often a subset of piping designers and draftsmen, because one needed to be able to read technical drawings and know what these things were, who were willing to get their hands dirty with plastic, solvents, balsa wood dust and paints; oh my. There are anecdotal stories of fingers being glued together, inhalation of noxious fumes (from plastic solvents, adhesives and cements), lacerations and scrapes from cutting tools and dissolved fingerprints. As a comparison, today's process plant 3D CAD modellers might suffer from carpal tunnel syndrome, email overload or blue screens of death.

While today's 3D CAD models are physically intangible and require powerful computer hardware and software to create and use, they offer many more useful features than their physical predecessors, such as automatic documentation generation. Creating the initial 3D model can be as time consuming as manual drafting methods but the time and work-saving occurs downstream in the workflow.

As the digital model is being 'built', each component is either created from scratch or selected from a digital catalog (of geometric shapes) and then inserted into the model as well as automatically added to the associated model database (information file cabinet).

The database allows for automatic generation/extraction of orthographic drawings of plant areas, bills of materials, line designation tables, equipment lists, work packages, characteristics and geometry for pipe and structural stress analysis, piping isometrics, plot plans, etc; deliverables that had to be produced by hand either before or after the plastic model was built. The 3D model-database as well minimizes the possibilities of error while transposing information from the model to deliverable documents.

SOME LIMITATIONS AND CAVEATS REGARDING DIGITAL MODELS

[...]

Read More of this Article: http://www.spedweb.com/index.php/component/content/article/392.html

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The Bellows Bottom Line

Practical advice on expansion joints

by Greg Perkins FEB 2015

This month - **Water Hammer in Piping Systems**

Not so fast on using a metal expansion joint

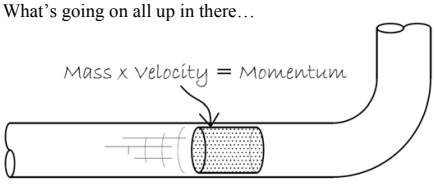
The big bang

You shut off the sink faucet and immediately hear a bang and then the after-shock rattling in the piping. You, my friend, have just experienced an effect known as water hammer.

Not only is water hammer a common house hold annoyance, it bounces around steam and process piping all too often. Although this does not call for an expansion joint solution, feel free to call and chat as we think of ourselves as piping system therapists sitting around in cardigan sweaters ready to validate you; plus we get community service hours for this.

The shock and awe of mass x velocity

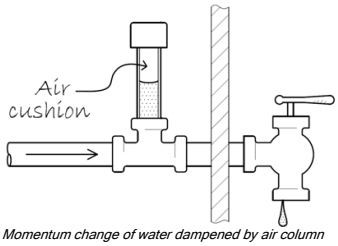
What's going on all up in there…



Piping shocked by change in momentum of fluid slug

A mass of fluid traveling through a pipe will hit a closed valve or elbow with force, moving or breaking things.

Let's look at our home plumbing example. Modern building codes call for a 'dead-leg' before the faucet valve. There is a natural cushion of air formed in this leg when the system is first filled with water (at 50 psig).



Momentum change of water dampened by air column

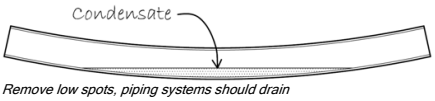
When the valve is abruptly closed the water surges into the dead-leg and is cushioned as the air is compressed, and so there is no water-hammer effect. This is very similar to how a process piping pulsation damper works.

Here's a free home life hack - sometimes the air in the plumbing dead-leg leaks out over time. Drain the entire system and refill to recharge the air cushion and eliminate any water hammer. I always wanted to use "life hack" in a sentence.

Enough plumbing! Fix my process piping problem!

In piping systems carrying fluids, the speed of the valves closing can be slowed to minimize water-hammer.

In steam piping, avoid low spots that can collect condensate which then can gather into fast traveling slugs of water.



Remove low spots, piping systems should drain

The water hammer damage to piping systems can also be reduced by the use of pulsation dampers and pipe snubbers; one cushioning the fluid internally, the other cushioning the sudden pipe movement.

Notice metal expansion joints did not make the solution list. Trust me; it makes me sad just to write that.

The Bottom Line

There are solutions to the water hammer effect in process piping; expansion joints are not one of them.

But do call us anyway; we're behind on our community service hours.

The Bellows Bottom Line is a publication of Oakridge Bellows - for a free subscription sign up at www.oakridgebellows.com
For expansion joint information Greg Perkins can be contacted at gperkins@oakridgebellows.com or (830) 626-7773
Oakridge Bellows **190 S. Seguin St.** **New Braunfels, TX 78130**

LEARN MORE ABOUT PROFESSIONAL PIPING DESIGNER (PPD) CERTIFICATION FROM SPED - CLICK HERE

Process Piping Design Industry-Related News

The Potential Pitfalls of Computer-Aided Pipe Design

"Jim E. Meyer, lead engineer for Louis Perry Group and facilitator for the American Society of Mechanical Engineers (ASME) course on the B31.3 Process Piping Code, notes that the code was devised over half a century ago, well before computers and other forms of hi-tech equipment were accessible tools for engineering professionals." […]

"The speed with which analysis can be conducted means that engineers can practice pipe design more freely without the need to worry about expensive or time-consuming analytical process."

"40 years ago we were very careful to design a system which would not require many iterations because of the time involved," said Meyer. "Now it is so fast it is easy to push the button for the analysis and just see what the computer tells us." […]

"Computer software is used to meet the design requirements in the code - computers now let a piping designer layout the piping in a 3D model and import the geometry to piping analysis software, so sometimes an analysis can be completed without any real thought on the part of the engineer," he said.

"If the analysis results say the system meets code requirements, many engineers will sign off without giving it any more thought, and as we rely more on computers, we are losing some good design practices."

For the full version of this article, see: https://sourceable.net/potential-pitfalls-computer-aided-pipe-design/

Eastern Canada Offshore Development

"While most portions of North America have seen E&P activity shrink to levels that are a fraction of what they were two years ago, work in Newfoundland and Labrador, and Nova Scotia, continues to move forward, due, in part, to long lead times and very promising geology."

Canadian East Coast offshore drilling goes back to 1967 with the Sable Island natural gas project off Nova Scotia. Current Canadian East Coast production and in-development facilities include four oil-producing fields (producing 25% of Canada's light oil) off Newfoundland and two natural gas projects (producing 350MMcfgd) in the Sable Island area.

The World Oil Magazine article takes a wide look at the history, achievements and future promise of E&P, offshore East Canada.

For the full version of this article, see: http://www.worldoil.com/magazine/2016/april-2016/features/east-canada-stays-the-course-in-navigating-offshore-development

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Take the Pledge!

100% CLUB
SPED Professional Piping Designers

Join the SPED PPD 100% Club

SPED PPD 100% Club members pledge that 100% of their Piping Designers will become certified as Professional Piping Designers (PPD). Documenting staff credentials are simple:

- 100% of current Piping Designers get PPD Certified within one year of joining the program.
- New hires become PPD Certified within one year of employment.

Once you sign up and become a member of the PPD 100% Club, you can display the Club logo.

The PPD 100% Club Benefits EPC Employers, Clients and Piping Designers!

Contact us for more information.

The PPD 100% is exclusively for SPED Corporate Members. SPED supports PPD 100% Club Members by providing the following:

- A copy of the PPD Review Video to help Piping Designers prepare for PPD exams.
- On-Call testing at the SPED office. (Fees apply.)
- Onsite testing review with 20 or more participants. (Fees apply.)
- Assistance to members in applying for State Funds to defray training and testing costs.

SOCIETY OF PIPING ENGINEERS AND DESIGNERS
SPED

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New project?
Staffing issues?

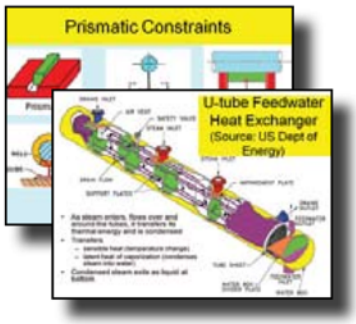
THE SPED PIPER VIDEO SERIES IS YOUR ANSWER.

"It's the Piper's resource for Information and Just-in-Time Training."

PIPER BOOTCAMP covers equipment and fittings necessary for routing pipeline from nozzle to rack to nozzle.

PROCESS PLANT LAYOUT covers knowledge and skills required for plant equipment and layout. Targets pipers already familiar with in-line pipe routing.

Version I contains original video recordings of live presentations by industry leaders.
Version II contains newly recorded videos with additional topics, and extended notes.



Designed for the new Piper and as a useful resource for experienced Pipers, the SPED Piper Video Series is considered the Industry Standard for piping training.

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For more information, call 832.286.3404 or email videos@spedweb.com.

About SPED

The Society of Piping Engineers and Designers (SPED) was founded in 1980. The international organization is designed to promote excellence and quality in piping design and engineering, through professional development, training and certification for piping designers and engineers.

Volunteer for SPED

Volunteers are needed to carry on the charter; if you are interested in volunteering for a task or there is something you wish to see SPED provide to its membership and are willing to organize an event, please contact us.

SEE YOU NEXT MONTH!