



VISION

Commissioning Planning 101

VISION is published by
Venture Engineering & Construction,
an engineering company for
process industries.

Venture Offers:

- Process Engineering -
- Mechanical Engineering -
- Civil/Structural Engineering -
- Electrical/Controls Engineering -
- Environmental Engineering -
- Project Management -
- Permitting -
- Forensic Engineering -
- Master Planning -
- Architectural Services -
- Full Service EPCM -
- Front End Engineering -
- Installation Engineering -
- Construction Management -
- Commissioning & Startup -

Venture Markets:

- Power & Energy -
- Chemicals -
- Petrochemicals -
- Pharmaceuticals -
- Metals -
- Government -
- Commercial -
- Institutional -

Venture Engineering & Construction

800 Waterfront Drive, Suite 100A
Pittsburgh, PA 15222

Phone: (412) 231-5890

Fax: (412) 231-5891

www.VentureEngr.com

info@VentureEngr.com

There are volumes of information on commissioning, and if you are new to it, where do you start? Why is it important?

Commissioning is important because it (is):

- A systematic process of testing and verification that gets the owner from construction to production.
- Usually linked to contractual milestones.
- Identifies and solves problems before the operators find them.

While most people agree on the value of commissioning, not everybody agrees on what it is. Further, different organizations and publications use different terminology, or the same terms differently. Commissioning of industrial facilities is more comprehensive than commercial facilities, typically because of more life-safety concerns, but that is changing. So if there is no guidance specific to your business sector, where do you start?

ASHRAE Publication Guideline 0-2005 "The Commissioning Process" is a concise reference that lays out the commissioning process. Though emphasizing the commercial/institutional applications, it contains guidance relevant to industrial projects. ASHRAE's definition of commissioning is: "A quality-focused process for enhancing the delivery of the project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the Owner's Project Requirements." As definitions go, it is sweeping, but not a bad place to start.

Venture personnel have experience with both commercial/institutional commissioning and commissioning of industrial facilities. Here are some thoughts from Venture on how to approach commissioning:

- Allow personnel to participate in design reviews.
- Bring in the commissioner during early project engineering, which transitions

to the commissioning role.

- Be careful not to over-rely on the commissioner for code compliance. The designer knows the discipline-applicable codes.
- Determine the systems to be commissioned and the level of effort required; jointly between the construction management, operations, and commissioning teams.
- Commissioning documents can serve as a baseline of data for maintenance personnel. This has implications for data gathering.

To develop the commissioning program, consider:

- Commissioning plan preparation—contract and design documents that apply, and determine the input of designers, contractor(s), and owner.
- The approval process.
- Involvement of regulators and their impact in the process.
- Commissioning versus contractual milestones.

The June 2008 issue of Consulting-Specifying Engineer features: "Commissioning Documents: necessary evil" that draws heavily on the ASHRAE reference. It describes the importance of three documents prepared prior to commissioning – owner's project requirements, basis of design, and systems manual.

These documents, or comparable documents, are key to helping the commissioner answer the owner's basic questions:

- 1) Did I get what I paid for, and
- 2) Does it work the way it should?

As far as Venture is concerned, it is more important to have a team of good, qualified people in the field than documents, but good people with good paper get better results. Contact Don Olmstead, ext. 302, if you have a commissioning opportunity or want to bounce around ideas.

In this Issue:

STAFFING THE VENTURE WAY | PROJECT ON SPOTLIGHT | CONTEST: QUALITY IS... FUN? | COMMISSIONING IN THE FIELD

Staffing the Venture Way

At its core, Venture's business plan is simple – we sell projects, and we execute projects. We try to do this in a way that provides a quality, cost-effective product to our clients. In a time where good people are in high demand, and prone to move, staffing has to be an integral part of our business model. To that end we go to a lot of trouble to recruit qualified people with intelligence and vigor and equip them to be successful.

Venture's Strategy – Equip, Train and Retain!

Lean Management/ Boom Management

Broadly speaking, engineering firms that grew lean during 2001-2002 and managed accordingly, have responded with varying effectiveness to the boom we are still currently experiencing. Instead of taking advantage of new tools, and training people to use them, "making do" continues to be Standard Operating Procedure. Engineers still routinely encounter no-win situations, such as being required to design to a current code but refused authorization to buy the current code, unless the project is big enough to bury the cost. Operations defends the reluctance to invest in tools and training by pointing out that the firm makes its money selling hours, not tools, or by belittling "whiz-bangs."

We see it differently. In a strong market, there is no large pool of qualified engineers and designers looking for work, and staffing to meet a growing backlog becomes increasingly challenging. How do you get it all done?

Venture's Response

Our response to the current boom is to invest in tools, and training. One advantage of being a recent start-up is that all our tools are new. We are fortunate enough to be capitalized, so we can afford to invest in a top-notch enterprise system like Deltek's Vision from Day One, when we were just three guys with laptops in our cars looking for space, buying computer equipment, and interviewing people in the lobby of the Cork Factory. Now that we are twenty plus and growing, we can reap the benefits of features such as: integrated timesheets,

The Right People

Herb Brooks, coach of the 1980 U.S. Olympic "Miracle on Ice" Hockey Team said "I'm not looking for the best players, I'm looking for the right ones!"

For us the right person has the right attitude, verifiable credentials, and an understanding that field work is an indispensable part of the job.

The right person might be entry level or a grizzled veteran. They are willing to adjust and work compatibly with coworkers and clients. They need to buy into our compensation model, which is intended to motivate everyone to contribute to organization success, not focus on their personal success.

The right person also needs to respect that our product best meets a client's needs when our processes allow for creativity, from CAD operator through engineer to contractors, owners and customers. Our work environment is idea-friendly. As part of that spirit, candor, and a little humility go a long way too.

Finally, we look for referrals from a trusted source, whether a coworker, client, or recruiter with a track record.

expense reports, project controls, invoicing, planning and resource management, available in real-time (the data is immediately available to Project Managers as people update their time and expense sheets). Our other productivity tools include AutoCAD Inventor, ChemCAD, Thermoflex, and smart PID and electrical design software.

When the tools are coupled with people who know how to use them, the improvement in productivity is remarkable. For example, through use of AutoCAD PID, our staff do not have to waste a lot of time manually cross checking valve and instrument lists against the PIDs because lines were added or eliminated due to a HAZOP, value engineering, or a change in scope. The list of valves and instruments is part of the PID. As lines and features are added or removed, tagging essentially takes care of itself. This feature alone has the potential to trim a couple of hundred hours off a larger project, and allows our staff to focus on other areas.

Second, we invest in people. In the lean organization, staffing tracks closely with backlog, to keep that breakeven multiplier as low as possible. I heard one manager and long-time friend joke darkly that the motto at his firm was "People

are our most valuable disposable asset!" Staff are placed in a no-win situation; with responsibility to maintain chargeability without the necessary backlog, and quickly learn to stay billable, at the expense of the project manager's hair.

Our formula for retention is simple. First we hire carefully. Then we work to eliminate no-win situations: we respect professionals and equip them with best-in-class tools, we motivate through top-to-bottom profit sharing, we provide internal and external training, and we do not sacrifice our valued staff just because we had a bad month, or an individual's utilization fell short of the target.

The Bottom Line

Obviously, there is an impact on multiplier. Our multiplier may indeed be slightly higher than local competitors. Perhaps we will miss opportunities because of this. But our tools enable us to work smarter and faster than our competitors, and in today's market schedule is king. Some will argue that equipping, training and retaining add costs disproportionate to the improvements in productivity and quality. We respectfully disagree. Our bottom-line and growth tell us we are on the right track. There are good customers out there who want good solutions and are willing to pay for them. If you share these values and have a project, please give us a call.



Venture Engineering ensures its staff to be the right mix of people. Show above: This is a portion of Venture's executives, engineers and designers.



Project on Spotlight

WALKING BEAM REHEAT FURNACE

Venture is assisting Core Furnace Systems with preparation of design drawings for a new walking beam reheat furnace for California Steel Industries in Fontana, California.

Core Furnace has made a decision to migrate from conventional 2-D and 3-D modeling on AutoCAD to 3-D modeling with AutoDesk Inventor. Venture is supporting Core in this process by assisting them with design of the furnace box and ancillary structures required to support the furnace during future major seismic events.

An element of complexity was added by Core's decision to fabricate components both stateside and in China, with the associated impact on units and shapes.

Venture used Inventor to modify Core's base model and to prepare 2-D detail drawings of the interconnecting panels, beams, doors, and "loose" pieces that make up the furnace's sidewalls, endwalls, and ancillary structures. Venture transformed Core's model into drawings that can be readily used by the steel detailer and fabricator of the furnace box.

All of our work on this project has been completed on-time and within budget. Accordingly, our client has elected to expand our scope.

According to our users, advantages of AutoDesk Inventor include:

- User friendliness and speed.
- Intelligence for functions such as line routing.
- Ease of preparation of isometrics.
- Checking of details is simplified.
- The model's dexterity with respect to rotation and zooming facilitates checking of otherwise challenging geometries.
- 3-D models allow for rapid identification and resolution of interferences.

Venture also offers capability in other 3-D tools such as Pro/E and SolidWorks. Contact us at 412-231-5890 if you have an application to discuss.

Contest: Quality Is... Fun?

At Venture we have been giving some thought to our quality program and how we want it to look. We have processes and qualified people and that is a great start. However, we believe that a lot of quality related initiatives do not provide the benefits they could because feedback from the field only goes to a few people, and they do not care to broadcast their mistakes!

With that in mind, we are asking people who have spent a lot of time in the field to list the frustrating mistakes and omissions they commonly see in the IFC design packages they get. As an example, doors that open into the landing handrail instead of down the stairs,

and butting skids together without considering that the ins and outs do not line up, are classics. Some personal favorites of mine – backgrounds for the different disciplines that do not match, and interdisciplinary clashes, should be things of the past thanks to X-referencing and 3-D modeling, although I know they still happen. Our goal is to create some reference lists of commonly overlooked problems for designers and engineers to use when checking drawings.

Naturally these discussions have led to great stories, which is the fun part. So to spread the fun, send your top three (or more) design peeves that you have encountered in the field, or a related anecdote, to

aartzberger@ventureengr.com. Our selection committee will award up to three \$50 gift certificates to Penn Brewery to the winners.

Contest Rules: Anyone can enter, but entries containing expletives will not be accepted. Names should be changed to protect the guilty. Points are awarded for credibility and entertainment value. Criteria for selecting the winning entries are otherwise arbitrary.

Winning entries may be published in Venture Vision, if the author gives permission.

A Message from Vision's Contributors and Editors



In this quarter's issue of Venture's Vision, a technical and informative approach is the goal. As mentioned in the first issue, we hope this publication will serve as a reference to clients, partners, friends, vendors and suppliers.

Manager of Engineering Don Olmstead contributed his expertise and experience in commissioning to this edition. We hope this provokes readers' consideration of the value of commissioning and inspire improvement in the process. We encourage feedback about this issue, and all issues, of Vision. Any commissioning thoughts and questions can be directed to Don Olmstead. Any Vision-related ideas and feedback can be directed to Amanda Artzberger.

Thank you to everyone for making Venture a booming success!

Don Olmstead: (412) 231-5890 x302 or DOlmstead@VentureEngr.com
Amanda Artzberger: (412) 231-5890 x315 or AArtzberger@VentureEngr.com

Commissioning in the Field

Venture recently completed the commissioning of a combined heat and power plant consisting of two 1.4 MW engines with generators, fueled by digester gas or natural gas, as well as a tail gas blower retrofit to an existing landfill gas operation.

As usual our commissioners have returned with great war stories. So what do they have to say? The comments have not changed much over the years. Here are some typical ones.

1. **Every system has a "brain" and most skids have a "brain."** Every brain has operating parameters and control parameters. Add VFDs or soft starts and there are more parameters. Factory default settings are just a starting point to achieving a tuned, balanced system.
2. **If the salesman told you the system is "plug-and-play," he's lying.** Allow time for commissioning. Allow time for commissioning planning.
3. **Seek out operating instructions in writing.** If everybody knows how it's supposed to work, and it's not written down, that just means that everybody has an opinion about how it's supposed to work, and they are all different.
4. **Make sure the designers of record have some budget for commissioning.** The commissioners have to understand the designer's intentions, not just the owner's expectations. The commissioners need the designers input especially if performance targets are not achieved.
5. **Get operations involved in commissioning.** There is no better training.
6. **Get the construction team's buy-in.** Fighting with an uncooperative or frustrated contractor wastes time. If the contractor says a system is ready and the commissioner says it isn't, pay attention to the commissioner.
7. **Give the commissioners an opportunity to evaluate the system while it is still on paper,** if there is a performance requirement to be demonstrated. They especially will see where tees need to be added for flushing/purging and intermediate process monitoring points, bypasses, etc. that will save time and money in the long run and the short run. The easier the commissioner's job is, the faster a facility gets to full production. Get the commissioner(s) involved earlier than later.
8. **Give the commissioner an opportunity to review bid specs.** He will be able to harmonize the commissioning requirements of Div 1 with the scattershot, sometimes conflicting requirements of all the other divisions. It avoids "gotcha" games later.
9. **PLCs and HMIs are great tools and inexpensive.** Use trending. Use the internet for remote monitoring. It will save time and help in diagnostics.

Venture News

Welcome New Employees

Rob Armstrong
Travis Buggey
Tom Minsinger
Matt Olmstead
Tom Stock

Employee News

Congratulations!

Carlos Caminos recently earned an EMT certification, which accompanies his Mount Lebanon Firefighter I and Hazardous Materials Operations certifications.

Happy Birthday

September
Carlos Caminos
Erik Cooley
Stephen Kranz
Tom Stock

October
Will Lowry
Don Olmstead
Alex Ussia

Party Time!

Venture Staff:
We are looking forward to seeing you at our first company picnic August 24 at Sandcastle's RiverPlex.