
ENGINEERING STANDARDS UPDATE

Standards are serious business, but this newsletter isn't.

Topics this month:

- **Pressure Safety Chapter Revised**
- **LANL Standards Issued in September**
- **DOE Technical Standards Actions**
- **When Good Conduct of Engineering Isn't Followed**

The Standards Homepage: <http://engstandards.lanl.gov/>

PRESSURE SAFETY CHAPTER REVISED

In September we completed revision of the Pressure Safety Program in ESM [Chapter 17](#). This revision by POC Ben Swartz incorporated all of the lessons and labwide alternate methods and clarifications since completion of the walkdowns in 2010. To avoid a nearly 500 page result, the chapter's main Section I (and its two other documents) were reorganized into six major sections (below), each with multiple documents, and all now at Rev. 0.

Section	Topic
GEN	General (applies to all)
ASME	ASME construction
NASME	Non-ASME construction
EXIST	Existing and legacy systems
ADMIN	LANL-specific administrative processes
REF	References

The most significant new requirement is the need for a project Pressure Safety Implementation Plan (PSIP) in ADMIN-1. This was implemented because of problems experienced with some recent projects. The submittal's purpose is to "allow LANL to confirmation that the design agency understands the requirements of this chapter at an early stage." ADMIN-1 states that "Each project must assess and plan for compliance with ESM Chapter 17 Pressure Safety. The project-specific PSIP shall be submitted to the CPSO or designee for review and approval in the early stages of project design (e.g., 30% complete) and resubmitted at later review phases (e.g., 60%, 90%) if/as it matures. The PSIP shall address all areas of pressure safety compliance including the following items..."

LANL STANDARDS ISSUED IN SEPTEMBER

September was one of the busiest months in the 30-year history of the Standards Program. In addition to the revision of ESM Chapter 17 discussed above, incorporation of DOE O 420.1C Facility Safety requirements drove the revision of most of the nuclear-safety related chapters (Fire Protection was last November). As discussed last month, Chapter 5 Structural is expected to be revised by March 2015, and at that time DOE O 420.1C will become the code of record for the design of all new facilities and major modifications to nuclear facilities (substantial change to safety basis per [SBP114-1](#)).

Eng Standards Manual [STD-342-100](#)

Chapter/Section	Summary of Changes
Chapter 1 - General	
Section Z10 - General Requirements for all Disciplines/Chapters Rev. 11	Clarifications on applicability, edition, amendments, NCRs and conditional release, COR, eng during construction, sealing, critical characteristics, definitions. DOE O 420.1C changes.
Chapter 6 - Mechanical	
D10-30GEN, General Mechanical Requirements Rev. 5	Minor admin updates
D10+E10, Equipment Rev. 4	DOE O 420.1C and G 420.1-1A update, other admin and minor changes.
D20, Plumbing/Piping/Vessels Rev. 5	General admin update, alignment to Chapter 17; minor changes to eyewashes, breathing air.
D30, HVAC, Heating, Cooling, HVAC Distribution and TAB Rev. 5	DOE O 420.1C and G 420.1-1A updates, revised duct detectors for 100 percent outside air, minor admin and other changes
Chapter 7 - Electrical	
Section D5000 Rev. 7	NEC adoption follows state (2.2). Added Subsection 5.10, Overcurrent Protection to clarify the used of circuit breaker versus fuses. Revised Subsection 12 to incorporate DOE O 420.1C. Other minor technical and admin updates.
Chapter 8 - I&C	
Section D3060.90 Instrumentation & Control Rev. 4	Section became D3060.90. Updates for DOE 420.1C; Section 5.0 became BAS, other updates. Appendices changed to Attachments.
Chapter 10 - Hazardous Process	
F1030.60, Hazardous Process Rev. 2	Requirements changed to incorporate 420.1C, admin updates.
Attachment A - Hazardous Gas Design	Became Att A. Updated for 420.1C, 420.1-1A, and lessons learned. Other administrative changes.
Chapter 12 - Nuclear	
F1030.70 Rev. 3	Changes for DOE O 420.1C and G 420.1-1A

Chapter 16, IBC Program	
Chapter 16, IBC-IP Att. B - Statement of Special Inspection	Clarified the NDE associated with the weld inspection may be performed by an approved subcontractor or third party
Chapter 17, Pressure Safety	
Entire Chapter - Rev. 0	Complete revision and reorganization into multiple sections. Project Pressure Safety Implementation Plan (PSIP) is a new requirement.

Master Specifications [STD-342-200](#)

31 2000 R9 Earth Moving	Clarification in 2.2.A for pipe bedding material. Thanks to Ron Rager, Mell Smithour, and POC Jerome Gonzales.
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Drawings & Details [STD-342-400](#)

Mechanical ST-D30GEN-1 rev. 2, Open Cooling Tower Water Treatment (2 sheets)	General revision. Thanks to Shawn Hailey, Jason Montoya, John Sur, POC Michael Ladach, etc.
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[DOE TECHNICAL STANDARDS ACTIONS](#)

DOE Tech [Stds](#) activity since last Update:

DOE-STD-1213-2014, July 2014, Protective Force Contingency Planning Technical Standard (NEW)

DOE-HDBK-1214-2014, Conduct of Operations Assessment Field Handbook (NEW)

DOE-STD-1070-1994, Criteria for Evaluation of Nuclear Facility Training Programs (July 2014 reaffirmation)

[The coming architect/engineer brain drain, or 'Curse of the Baby Boomers'](#)

BUILDING DESIGN+CONSTRUCTION, September 03, 2014

Architecture, engineering, and (presumably) construction firms will face difficulties with management succession, as tens of thousands of Baby Boomers leave the AEC industry. Who will fill the knowledge gap?



Illustration: ratch0013 via FreeDigitalPhotos.net

I got an interesting letter—yes, an actual letter, in an envelope, what a concept!—the other day from Ray Kogan, AIA, Principal of [Kogan & Company](#), a management consulting firm in Arlington, Va. (Ray and his colleague, Cara Bobchek, will be conducting a half-day workshop at our BD+C ["Under40 Leadership Summit"](#) in NYC later this month—Sept 18 to be exact—teasing out the role of "scenario planning" as a key component of strategic planning for AEC firms.)

Back to Ray's letter. "The demographics are compelling and irrefutable," it stated. Baby Boomers constitute a huge proportion of professionals in design firms. Extrapolating from U.S. Census data, Ray estimated that one-third—33%—of employees at A/E firms are older than 55. That's a good estimate, considering that the AIA says that 44% of all U.S. architects are older than 50.

Here's the unnerving part (again, using U.S. Census data as the base): "In the next 15 years, the number of architects and engineers aged 55-64 will increase by 47%, while the number of *those aged 33-54 will decrease by 6%*." Put all those numbers together, he surmises, and the country can look forward to an "exodus of tens of thousands of Boomer architects and engineers from the profession they have served for decades."

Kogan's conclusion: The exodus of the Boomers will lead to the loss of "an incalculable amount of valuable knowledge—technical, managerial, and institutional." The loss of thousands of Baby Boomers who currently form the core management base of their firms will be especially wrenching for the A/E sector. Somehow their knowledge and experience has to be captured for their firms to survive down the road.

The clock is ticking, says Kogan. "Capturing and institutionalizing the knowledge they've gained through the decades is a one-time opportunity—really an imperative—for our firms, our profession, and our industry."

Ray and I would love to hear your thoughts on this topic. Send them to: rcassidy@sgcmail.com.

WHEN GOOD CONDUCT OF ENGINEERING ISN'T FOLLOWED

Once again, this month's topic isn't entirely CoE but is interesting, and was forwarded by Jerry Gutsell – many thanks!

Below is a short video of a Pakistani pile-driving construction technique. Notice that the pile-driving only becomes effective when the extra man jumps on. Very finely tuned! The chant is also catchy! The foreman is the guy on the tambourine.

But before you watch the video let's analyze the engineering here:

6 men x 180 lbs = 1800 lbs static force. Jumping up and down will create a 3 times dynamic effect = 3240 lbs/jump = 1.6 ton thumps if the pile is tapered to 2 in x 2 in, cross section at the tip = 4 sq. in.

So, dynamic pressure/thump at pile tip = $3240/4 = 800$ psi.

"Add a man" feature will increase to 950 psi, so buy the option!

Increase the chant and dynamic force goes up to 5 times to bring max. pressure/thump to 1600 psi for a 7-man team.

Quite good and will penetrate hard clay and sandy soil but not hard rock! Pretty ingenious.

<https://www.youtube-nocookie.com/embed/cFb0nLCKypg?rel=0>

LAST MONTH'S UPDATE TOPICS

Miss an issue? The archive is at "[Monthly Update](#)" on the Standards [homepage](#). Last month's topics:

- **USG Seismic Ceiling Seminar Tues, Sept 9**
- **DOE O 420.1C Implementation**
- **Nuclear Workers Behaving Badly**
- **National Standard Committee Participation**
- **LANL Standards Issued in August**
- **Engineering Processes**
- **DOE Technical Standards Actions**
- **When Good Conduct of Engineering Isn't Followed**

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