

ENGINEERING STANDARDS UPDATE

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

Topics this month:

- **Form 2178 SDDR Revised**
- DOE O 420.1C Chg 2 Coming to a DOE Lab Near You
- New Civil Standards POC
- Training & Qualification
- LANL Standards Issued in April
- Electrical and Building Safety Month
- Engineering Processes News
- DOE Technical Standards Action
- National Standards Action
- When Good Conduct of Engineering Isn't Followed

The LANL Engineering Standards: <http://engstandards.lanl.gov/>

FORM 2178 SDDR REVISED

In April we revised Form 2178, the CoE Subcontractor Deviation Disposition Request. It's referenced in subcontracts, by AP-341-519 *Design Revision Control*, and by some LANL Master Specs for fabricated items like gloveboxes. The form now can serve as a design revision tool and includes lessons learned from RLUOB. It's posted on the [Forms Center](#), plus the Standards [Homepage](#) where suppliers can access it. Thanks to David Harvey, Darren Meadows, and Jeff Fauble!

DOE O 420.1C CHG 2 COMING TO A DOE LAB NEAR YOU

The Los Alamos Field Office has asked LANL to assess the impact of following DOE O 420.1C *Facility Safety* Chg 2 rather than Chg 1. Jason Apperson is leading that effort and it's expected that the end result will be modification to the Triad contract in the weeks ahead. Coupled with that, an implementation plan will probably be necessary since the new order wording invokes a number of newer DOE Standards and other requirements, and revising the Engineering Standards and other documents to effectively and efficiently implement them will take a little time. None of this should affect projects underway. And while there will be clear direction once all the dust settles, some new project scoping/RCD efforts during the implementation phase may have to coordinate a bit.

NEW CIVIL STANDARDS POC

John O'Brien has taken the reins from Scott Bane. That Kentucky Derby-esque analogy is apt since the civil content of the standards depends on a whole Budweiser wagon's team of subject-matter-expert system engineers in UI with mechanical and civil backgrounds. Since John is a team leader in ES-UI he's probably already used to reins and, possibly, whips. I'd better stop there.

So, many thanks to Scott B who defended the sanctity of the civil standards the past 2+ years. Donald Yardman continues as Alternate POC—as well as the aforementioned SMEs when it

comes to negotiating variances to matters like underground utility clearances (please refer to "Civil Spec Variance New Approach" in the [May 2018 Update](#)).

TRAINING & QUALIFICATION

Electrical Standards – Wed, May 29 WRTC 112

Four-hour course [17998](#) covers the electrical engineering standards in Chapter 7 of the LANL Engineering Standards Manual and discusses mandatory requirements and good practices for those involved in electrical design. Strongly suggested for electrical designers, electrical engineers, electrical safety officers, and facility managers. AEs are also encouraged to attend. Taught by Electrical Standards POC Eric Stromberg from 7:30–11:30 am, at White Rock Training Center TA-00-1308 Rm 112. Also planned for 8/7, 11/14.

Standards Intro Course [24140](#) – Tues, June 11 C-Div Auditorium TA-46-0535

Provides familiarity with national and LANL engineering standards for anyone performing, reviewing, or managing design activities. **Required** course for many LANL engineers, recommended for those at local AE firms. Presented 8 a.m.– 4 p.m., by yours' truly. Next offering will be several months from now. Ruby Molinar will email the handout to print a few days prior so don't wait until the last day to register.

CGD Overview & Preparers –Wed, June 12 (New date) Canyon Complex room 165
Required if you need to do commercial grade dedication for nuclear service per AP-341-703; take one or both courses as needed. Taught by Rick Sarwal.

8:30-10:30 a.m. Course 30726, CGD Overview for Managers, CGD Preparers, others.

Prereq for 30727.

10:30 a.m.-4:30 p.m. Course 30727, required for CGD preparers and reviewers (like IQPA).

ESM Chapter 21 Software Overview and Owners Courses – Thurs June 13 Canyon Complex room 165

Perhaps a few of you are new "Owners" of nuclear safety or other ML-1, -2, or -3 software (installed in a system, or maybe for design/analysis). Most people in that situation are or soon will be subject to ESM Chapter 21 Software and need to take required training on the chapter. (Non-"Owner" tech staff in ES-Div may take the a live course such as the 38047 overview, but if they don't they must take UTrain Required Reading 38040, which should show up in their to-do list if so). So...if you, in fact, need live training, please enroll for the course(s) below. If you're not sure what you need, contact me (5-8475) or SME/Instructor Joy Getha, 5-9586, jlgetha@lanl.gov

- [38047](#) ESM Chapter 21 Software Overview Course 9-11:30 a.m. (RLMs and Owners)
- [34048](#) ESM Chapter 21 Software Owner's Course 1-3 p.m. (just Owners return for this)

B31.9 Building Services Piping Course Perhaps? ESM Ch 17 POC and Chief Pressure Safety Officer (CPSO) Ari Ben Swartz is considering presenting his B31.9 class this summer if there is interest; if you send an [email](#) to both Yolanda Trujillo and Swartz they will add you to the tentative roster. They will also need to know if you will be taking the class just for familiarization of if it's for qualification as a PSO Duty Area C (Curriculum 11959; your RLM must

approve your inclusion into the Curriculum for the PSO assignment). The PSO Qualification Standard defines all the training requirements for Duty Areas and is available [here](#).

REGISTERING for UTrain Courses: Go to [UTrain](#), search on course, select and enroll. Disenroll if you have to bail. AEs can also register; use token (CryptoCard) or contact ES T&Q coordinator Yolanda Trujillo at 665-5696 or yjtrujillo@lanl.gov with Z number.

LANL STANDARDS ISSUED IN APRIL

ESM Chapter	Section	Title	Date
Chapter 1 - General	Z10 Att C	Posted "Line Item Conceptual and Preliminary Design Expectations - Raines memo 2018-5-1" as a reference	5/1/18
Chapter 1 - General	210 System List	Revised Attachment 1: Systems List Thanks to Charlie Nuss, Jacque Seay, Esperanza de la Ossa, others.	4/9/2019
Chapter 17 - Pressure Safety	NASME	Reference: Reputable manufacturers xls for when listed components cannot be used, as discussed in NASME-1-a, b, etc. (LANL only). Tx to Ben Swartz.	4/2/2019

Master Specs

Spec Number	Rev.	Spec Title	Effective	Summary of Revision
n/a-multiple	0	Seismic Spec-editing Guides, Flowchart	4/24/19	NEW – see Spotlight below

Drawings & Details

Ch.	Dwg. #	Sheet	Rev.	Title	Date	Summary of Revision
6 Mech	ST-D30GEN-2	6	3	Hydronic Preheat Coil Piping Detail Constant Flow, Fail to Full Heat	4/8/2019	Incorporated lessons learned; sheet number was 6 of 11. Tx to Nashana Johnson, John Sur, Todd Smith, POC Michael Ladach.

Standards Spotlight: NEW Seismic Spec-editing Guides, Flowchart

Because LANL is a Seismic Design Category D, most nonstructural components in mechanical, electrical, and fire systems in and on buildings have to be anchored and sometimes braced. Getting that design done correctly has always been a challenge because of all the considerations, but now these have been distilled into a handy [flowchart and two spec editing guides](#). These were created by Glen Pappas along with the affected POCs and recently approved and linked from the specs index webpage. Having easy-to-follow guidance is allowing us to streamline the seismic authors notes in the specs down to a bare minimum.

In case you're interested in an overview: The first design consideration is understanding if the component or distribution system is in the ASCE 7 Chapter 13 scope, and if it is, is it seismically exempt (the IF). If not, then there's the question of WHO is responsible for anchorage design; this is generally either (1) the Project's structural engineer of record during Title II design—this is the expectation when the component is known and won't change by substitution—or (2) during Title III by the construction subcontractor via delegated design (a third, rare, method is manufacturer's certification of seismic qualification). Once the IF and WHO is understood, the designer must know the component's seismic performance requirements (the WHAT): are they structural integrity/position retention or that plus functional/operation after a quake?

Once the above is known, it's a relatively straightforward matter of tailoring the specs' built-in options to fit. Heck, maybe even a non-structural engineer—sparkhead or gearhead (or what's an FPE nickname?) can draft it, then get a quakehead to review it. Civil engineers aren't subject to Chapter 13 so I won't publish their nickname, but it may relate to what flows downhill.

ELECTRICAL AND BUILDING SAFETY MONTH

May is always **National Electrical Safety Month**, a campaign of the Electrical Safety Foundation International ([ESFI](#)), a "non-profit organization dedicated exclusively to promoting electrical safety in the home, school, and workplace."

On this theme: No doubt Putin was "extremely strong and powerful in his denial" of Russia hacking the 2016 election, but their building safety seems weak. After the Sochi Olympics I ran a compilation of such code and/or aesthetic nightmares (thankfully, no polonium-210 poisoning afterward) and here are more. Thanks to Chip Conselman who sent a 60+ photo "Russian Inventions" slideshow a long time back that included these (it even had Russian music that resisted muting to the point that I thought I caught a virus, but nyet). Future excerpts may include plumbing, architectural, and traffic control device fails.

That's a 2-prong power outlet with a metal screw in it. De-energized...or is it?



May is also always **Building Safety Month**, an international campaign to raise awareness about building safety. The International Code Council announced the 39th annual [Building Safety Month](#) theme: **No Code. No Confidence.**

“Modern, regularly updated building codes and a strong system of code enforcement ensure that individuals and communities are safe in the buildings where they live, work and play – codes build confidence. As we face disasters on an unprecedented scale—from hurricanes and tornadoes to wildfires and earthquakes—building codes become increasingly important to the safety, health and well-being of our families and communities.”



ENGINEERING PROCESSES NEWS

The following Administrative Procedures have been revised and posted on the [SharePoint site](#):

AP-341-605-R4	Calculations Course if assigned: 44261	Issued: 4/30/19
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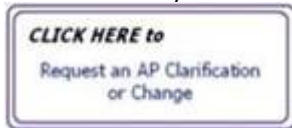
This revision (excerpts):

1. Replaced the term Checking with Verification and/or Design Verification.
2. Clarified applicability section.
3. Updated software requirements with references to ESM Ch. 21.
4. Eliminated specific references to Safety Basis use of procedure.
5. Deleted several unnecessary notes.
6. Added instructions for Interdisciplinary Review.
7. Eliminated Independent Review.
8. Changed Open Items to Unverified Assumptions.
9. Updated the calculation revision approval process.
10. Changed calculation template from FM02 to TMP01.
11. Clarified that facility level Calculation Log is maintained in a database.

12. Organization references updated.

For questions this AP, please contact Jeff Fauble at 665-5832. He's half-time-ish and more often at jfauble@lanl.gov; (if it bounces, click Outlook's "To" button and select him from the directory; after that the autocomplete will work). His apprentice is Sarah Terrill sterrill@lanl.gov, 7-7788.

When ideas for AP change come, please enter them in the SharePoint database. Use the live button below, same one that's found in the upper right of the Processes [homepage](#).



DOE TECHNICAL STANDARDS ACTION

Tech Stds Program [postings](#) in the past month:

DOE-STD-1183-2019, [Nuclear Safety Specialist Functional Area Qualification Standard](#) [for the Feds]

NATIONAL STANDARDS ACTION

LANL's [IHS](#) online codes & standards subscription reports these changes. They're just errata this month; ESM Ch 1 Section Z10 says "Errata (correct errors) to any document...are mandatory regardless of contract award date or code of record," so the above applies—assuming the standard edition is part of the project's code of record.

Document number: ACI 318 ERTA

Publication Date: 12/11/2018

Title: Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)

Type of Change: Errata/Erratum

Document number: IEEE NESCIR586

Publication Date: 3/27/2019

Title: National Electrical Safety Code

Type of Change: Interpretation

WHEN GOOD CONDUCT OF ENGINEERING ISN'T FOLLOWED



The military/industrial complex of which we're a part was rocked last week when news broke that fraudulent aluminum (with faked CMTRs) was marketed for 19 years and cost NASA two missions and \$700M. Several at LANL emailed around about this including Tommy Sant, Bill Wingfield, Steve O'Connor, Dave Torczon, John Verderber, Carl Walskog, and Kenneth Nadeau.

Articles on it included:

<http://fortune.com/2019/05/01/nasa-mission-failures-aluminum-scam/>

<https://www.forbes.com/sites/elizabethhowell1/2019/05/01/nasa-manufacturer-ordered-to-pay-46m-to-settle-claims/#4fd5dec86590>

<https://www.justice.gov/opa/pr/aluminum-extrusion-manufacturer-agrees-pay-over-46-million-defrauding-customers-including>

Wingfield wrote this:

THIS COULD HAVE BEEN PREVENTED BY INDEPENDENT TESTING

It's not good enough to verify the Chemical and Testing properties listed in the CMTR meets the ASTM Standard requirements.

For you that are auditing suppliers I want to reemphasize to you that both NQA-1 and NAP-24A require our suppliers to perform independent testing or independent assessments.

I have listed below the requirements from both NQA-1 and NAP-24A:

NQA-1:

ASME NQA-1 2008/1a-2009, Requirement 7 Control of Purchased Items and Services, Sec. 500 Acceptance of Item or Service, sub-sec. 503 Certificate of Conformance, states in part: "When a Certificate of Conformance is used, the minimum criteria of paras. 503(a) through (f) of this Requirement shall be met.... (f) Means shall be provided to verify the validity of supplier certificates and the effectiveness of the certification system, such as during the performance of audits of the supplier or independent inspection or test of the items. Such verification shall be

conducted by the purchaser at intervals commensurate with the supplier's past quality performance."

NOTE: NQA-1 talks about CoCs, but I believe this requirement is meant to apply to CMTRs as well.

NAP-24A:

NAP-24A, Weapon Quality Policy, 11/14/15, Attachment 2, Sec. 3.6 Procurement, sub-sec. 3.6.3 Acceptance of Procured Items and Materials states in part: "...b. When Supplier-provided reports are used as a basis of acceptance, the reported results shall be compared with requirements. The validity of Supplier-provided reports shall be periodically verified by the purchaser by at least one of the following methods:

- i.) independent evaluation to requirements; or
- ii.) independent assessment (to establish the validity of the Supplier-provided reports)."

NAP-24A, Weapon Quality Policy, 11/14/15, Attachment 2, Sec. 3.6 Procurement, sub-sec. 3.6.5 Certificate of Conformance states in part: "...c. The Purchaser shall establish means to verify the validity of Supplier certificates and the effectiveness of their certification process, by at least one of the following methods:

- i. independent evaluation of requirements; or
- ii. independent assessment (to establish the validity of the certificate of conformance)."

So, if you are auditing a supplier and they don't perform audits of their sub-tier suppliers, they have to have a program of independent testing of the materials to verify the validity of certificates.

This is very important. Please feel free to forward this to any others you might see fit.

LAST MONTH'S UPDATE TOPICS

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

- Shining Stars
- Engineering Processes News; Sarah Terrill
- When Good Conduct of Engineering Isn't Followed
- Environmental Management System; Earth Week
- Training & Qualification
- LANL Standards Issued in March
- DOE Technical Standards Action

The views expressed in this email are not necessarily those of my employer.
To request a change to this newsletter's distribution, please contact me.

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