

## **ENGINEERING STANDARDS UPDATE**

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

### **Topics this month:**

- **Procurement of Swagelok, Rosemount, Canberra for Nuclear Service**
- **Training & Qualification**
- **LANL Standards Issued in August or so**
- **Engineering Processes News**
- **O&M Criteria Changes**
- **DOE Technical Standards Action**
- **National Standards Action**
- **When Good Conduct of Engineering Isn't Followed**

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

**Note:** This newsletter has hyperlinks all over but the blue/underlined formatting may not show. Hover your cursor where you might expect one.

### **PROCUREMENT OF SWAGELOK, ROSEMOUNT, CANBERRA FOR NUCLEAR SERVICE**

A variance to P840-1, *Quality Assurance for Procurements* was approved regarding IESL qualification for suppliers with nuclear and non-nuclear product lines. It concurs that suppliers qualification should be based on their ability to meet technical and quality requirements of a specific scope of supply regardless of whether the supplier distinguishes between the two lines. The variance will allow for removal of restrictions in the IESL and optimize engineering resources in support of modifications and maintenance for nuclear safety-related equipment at LANL. Thanks to Jorge Ruiznavarro at ES-55. See it at [https://int.lanl.gov/policy/collections/exception-variance/documents/Form\\_3057\\_P840-1\\_R9\\_AC3\\_EB\\_2020\\_08\\_24\\_SIGNED.pdf](https://int.lanl.gov/policy/collections/exception-variance/documents/Form_3057_P840-1_R9_AC3_EB_2020_08_24_SIGNED.pdf)



**New construction exoskeleton developed**

Toolmaker Hilti [launched its EXO-O1 exoskeleton, designed to reduce frequent lifting strain on construction workers](#) for jobs such as hanging drywall and interior finishes. The exoskeleton weighs about 4 pounds, is worn similarly to a backpack and will roll out in the U.S. later this year.

Not quite as burley as Ellen Ripley's Cat P-5000 Power Loader in "Alien."



## **TRAINING & QUALIFICATION**

Per Ruby Molinar, upcoming courses via Webex (registrants will receive Webex invitation by the day before class).

### **ESM Chapter 21 Software -- Overview and Owners Courses – Oct 28, 29**

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. 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](mailto:jlgetha@lanl.gov). Next offering will be several months from now.

- [38047](#) ESM Chapter 21 Software Overview Course 10/28 9-12:00. (RLMs and Owners)
- [34048](#) ESM Chapter 21 Software Owner’s Course 10/29 9-12:00. (just Owners return for this)

*...and a reminder: [free LinkedIn Learning subscriptions for all](#)*

See how you can sign up for individualized, self-paced and online professional development program with thousands of relevant courses delivered by industry experts.

**For UTrain Courses: Registering:** 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 664-0118 or [yjtrujillo@lanl.gov](mailto:yjtrujillo@lanl.gov) with Z number.

**LANL STANDARDS ISSUED IN AUGUST OR SO**  
**Engineering Standards Manual ESM STD-342-100**

ESM-Chapter	Section	Rev.	Date Approved	Summary of Changes
Chapter 19 - Communications	D60, Communications	1	9/1/2020	<p>Thanks to POC Pete Lowe, Dave Schlegel, others: Improved coordination with 27 1000. Conduit requirements revised for vertical pathways within the building between comm. rooms to account for fiber taking the place of a majority of the copper count formerly needed. Horizontal pathways allowable bends increased from 180 degrees to 225 degrees between pull points. Added G6000 for labs or where electrical and communications are installed in the same raceway. Added use of white tape for identification. Outlet box sizes modified to specify sizes required dependent on type of cabling and number of cables per outlet box. Grounding conductor sizes reduced due to a lesser need for grounding resulting from fiber replacing copper entrance cables. Alignment to evolving industry standards; eliminated others more restrictive than needed (e.g., some BICSI). Public address system (voice paging) revised. Deleted D6060.40 "Uncleared Personal Warning Light System" and Appendix A "Administrative Access Control System" (Apollo), now in Chapter 9.</p>

**Master Specs** [STD-342-200](#)

Last week was CRAZY busy for Christina Salazar-Barnes and I.

Spec Number	Rev.	Spec Title	Effective	Summary of Changes
For the structural specs, thanks to Tadz Kostrubala and POC Glen Pappas for the revisions.				
<a href="#">04 2220</a>	3	Reinforced Unit Masonry	09/03/20	Revised submittals, fire resistance in 2.4.C.
<a href="#">05 1000</a>	11	Structural Metal Framing	09/03/20	Revised submittals, material specs for HSAs
<a href="#">05 2100</a>	5	Steel Joist Framing	09/03/20	Revised submittals
<a href="#">05 3000</a>	4	Metal Decking	09/03/20	Revised submittals
<a href="#">05 4000</a>	6	Cold-Formed Metal Framing	09/03/20	Revised submittals, clarified 1.1.B
<a href="#">05 5213</a>	4	Pipe and Tube Railing	09/03/20	Revised submittals
<a href="#">05 5313</a>	1	Bar Gratings	09/03/20	Revised submittals
For the electrical specs, thanks to POC Eric Stromberg and his committee that reviewed them.				
26 0519	7	Low Voltage Electrical Power Conductors and Cables	8/24/2020	Streamlined submittal requirements. Clarified text on wire color-coding and phase rotation. Added guidance in several locations (between starred lines). Removed some callouts to manufacturers. Clarified text in some locations. Expanded text on torquing requirements. Changed reference table for torque values from UL to ANSI. Added instructions when values can't be determined.
26 0526	3	Grounding and Bonding for Electrical Systems	8/24/2020	Streamlined submittal requirements. Clarified definitions of 'grounding'. Corrected text that did not conform to Code definitions. Corrected text on re-identification of conductors. Expanded text on torquing requirements. Added Hold point for inspection before work is covered. Added requirement that connection between LPS and Electrical Grounding Electrode System must be made outside the structure.
26 0536	5	Cable Trays for Electrical Systems	8/25/2020	Streamlined submittal requirements. Edited/added guidance for seismic. Added note for use in NFPA 75 rooms (IT equipment). Added requirement for firewall penetrations.

26 0548.16	3	Seismic Controls for Electrical Systems	09/03/20	Revised submittals, other minor changes; also thanks to Structural specs POC Glen Pappas.
26 0553	6	Identification for Electrical Systems	8/24/2020	Streamlined submittal requirements. Added guidance for emergency systems. Removed allowance for black letters on blue background. Edited text on labels to bring them into alignment with NFPA 70E. Added line to >40cal label so that the worker will know how far he/she has to be away from the equipment to get down to 40 cal
26 0700	4	Induction Motors-500HP and Smaller	8/24/2020	Streamlined submittal requirements. Added "Marathon" to list of acceptable motors.
26 2213	4	Low Voltage Distribution Transformers	8/24/2020	Streamlined submittal requirements. Added guidance for seismic considerations
26 2413	5	Switchboards	8/24/2020	Streamlined submittal requirements. Added requirement for manufacturer to supply and special tools needed for set up/ start up. Added requirement to compartmentalize locations with incident energy greater than 40 cal. Clarified requirements for ground fault protection. Changed torque table reference from UL to ANSI.
26 2416	4	Panelboards	8/24/2020	Streamlined submittal requirements. Clarified text in some locations
26 2419	5	Motor Control Centers	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Clarified when a motor control center is arc-resistant. Added requirement for separate mechanism in each bucket to engage/disengage stabs on bus. Added requirement for remote operators. Removed requirement that there be no control conductors across the hinge of a door. Added requirement that open MCC doors do not block egress. Added requirement to witness the torquing of all bus bar splices.

26 2500	4	Enclosed Bus Assemblies	09/02/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification General edits to clarify meaning. Added guidance on wall penetrations. Added requirement to supply a hook stick mount for each hook stick. Changed requirement for thermal imaging to optional.
26 2713	5	Electricity Metering	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Removed technical details of meter since we are requiring a specific meter with no substitutions. Deleted requirement to remove abandoned meters and associated equipment
26 2726	6	Wiring Devices	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Clarified requirement for device terminations with solid / stranded conductors. Corrected language: Receptacle vs. Outlet vs. Receptacle Outlet. Added Meltric as acceptable manufacturer. Added Plugmold 6000 as an acceptable product. Corrected section on flexible cords. Changed wording to match NFPA definitions. Changed "plenums" to "environmental air spaces." Changed RJ45 (connectors) to 8P8C. Corrected Grounding language to match NEC. Edited requirements for fluorescent lights on timers
26 2816	5	Enclosed Switches and Circuit Breakers	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Added requirement for door interlock defeat mechanism (this requirement was indirect, now it is explicit)
26 2913	4	Enclosed Controllers	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Edited requirement for number and type of spare fuses. Changed Hand-Off-Auto to On-Off-Auto to better match how these systems function at LANL

26 2923	4	Variable Frequency Motor Controllers	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning.
26 3334	2	Stored Emergency Power Supply System	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Removed requirement that batteries be lead calcium. Changed TVSS to SPD to match current codes. Added options for use in NEC art. 701 and art. 702 situations
26 3353	3	Static Uninterruptible Power Supply	8/31/2020	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Added requirement for the external maintenance bypass switch to be in a separate enclosure and not a part of the UPS lineup. Added requirement that the System Bonding Jumper must be in the external maintenance bypass switch. This also requires that the bypass line have a transformer in it
<u>26 4100</u>	4	Facility Lightning Protection	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Clarified that the lightning grounding electrode must be different than the building grounding electrode. Added guidance on use of materials, from the perspective of corrosion. Added guidance on installation of grounding electrode such that it can be tested at periodic intervals. Removed requirement for empirical testing. Added requirement that bonding jumper to electrical grounding electrode system be outside the building.
<u>26 4115</u>	4	Lightning Protection for Explosive Facilities	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Added note that the required 10 ohms contact resistance to the soil will have to be calculated. Testing is not possible after installation. Clarified that determination of "good condition" is visual. Added guidance on use of materials, from the perspective of corrosion.



<u>26 4300</u>	2	Surge Protective Devices	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Clarified the function of the indicator LEDs on the SPD. Clarified requirements for the connection point of the SPD to the panel.
<u>26 5100</u>	6	Interior Lighting	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Added guidance on the preference for 120 volt systems instead of 277 volt systems, due to maintenance.
<u>26 5200</u>	7	Safety Lighting	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Changed requirement for the number of spare lamps. Added option for lithium ion batteries. Added guidance for photo luminescent signs (they don't work when the regular lighting is LED).
<u>26 5600</u>	6	Exterior Lighting	09/02/20	Streamlined submittal requirements. Edited seismic requirements to be more applicable to each specification. General edits to clarify meaning. Changed lightning ground strike density from 8 to 3. Added guidance for LED luminaires. Removed Warranty language. Changed requirement for fuses at base of pole to optional.
<u>27 1000</u>	7	Structured Cabling	09/03/20	Revised to align with ESM Ch 19 D60 Rev. 1. Conduit requirements revised for vertical pathways within the building between comm. rooms to account for fiber taking the place of a majority of the copper count formerly needed. Horizontal pathways allowable bends increased from 180 degrees to 225 degrees between pull points. Added G6000 for labs or where electrical and communications are installed in the same raceway, use of white tape for identification, and seismic requirements

Section	Section/Title	Rev.	Date	Summary of Revision
200	Reference added: Digital Signature Software request and Readme	-	8/3/2020	New Acrobat Pro script for e-signing multi-sheet drawings. Distribution currently limited to LANL by request from website and no foreign nationals. Thanks to developer Ray Henderson, Michael Richardson, and POC Scott Richardson.

### ENGINEERING PROCESSES NEWS

The following Administrative Procedures have been revised and posted to the COE Administrative Procedures [SharePoint site](#). Always ensure you are working to the latest version of all Engineering Administrative Procedures adopted at your location.

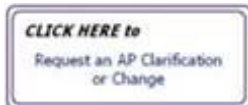
AP-341-519	<b>Design Revision Control</b>	<b>VAR-10418 - Engineering Request for Information Form (ERFI) issued 8/20/20</b>
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If you have been identified as requiring additional training on an AP you will see an assignment on your UTrain "to do" list.

In other AP news:

- AP-341-802 System Health Reporting: in DRS for review
- **AP-341-405 Identification and Control of Technical Baseline in Operating Facilities: in DRS for review**
  - This revision will work to integrate AP-341-403 Master Document List into the same procedure
- Upcoming revisions:
  - AP-341-602 Requirements and Criteria Document (with ES-EPD for revision suggestions)
  - AP-341-616 Technical Baseline Change During Design
  - AP-341-801 Post Modification / Post Maintenance Testing
  - AP-341-404 Master Equipment List
- Engineering Services is taking over management of the Submittals procedure from Project Management; that revision/creation is currently being worked.

The CoE Eng Processes Manager is Sarah Terrill, 667-7788, [sterrill@lanl.gov](mailto:sterrill@lanl.gov). Please enter issues with APs in the SharePoint issues database. Use the live button below, same one that's found in the upper right of the Processes SharePoint [homepage](#).



A webpage of the AP pdfs can be reached from LANL Internal with any browser/machine combo (also, you can easily get to [int.lanl.gov](http://int.lanl.gov) from [mymail.lanl.gov](http://mymail.lanl.gov)). Once in, you can navigate from the top of the [CoE home page](#) or directly [here](#). On the other hand, if you need the AP Word forms, open a terminal session and use IE for SharePoint for best results. When all else fails, email Christina Salazar-Barnes.

### O&M CRITERION CHANGES

Below are recent O&M Criterion and related Preventative Maintenance Instruction (PMI) changes issued by MSS-MP, the Maintenance Programs Group of Maintenance and Site Services Division. Implementation is required 30 days from issue date for non-nuclear facilities, 60 days for nuclear facilities.

It's best to use Internet Explorer to access them on the SharePoint site to avoid issues.

### Criterion 415 Rev 0., Aboveground Storage Tanks -- Initial issue.

The PMIs listed below have been revised to show only the Checklists. You must refer to the associated O&M to obtain the administrative portion. Any questions, please contact the document author.

Also, Work Orders that reference the below PMIs shall also reference the below forms such that it is included in the work package:

410-55-0400-C Rev 2 Fans and Ductwork	Supersedes: 410-55-0400-C Rev 1. The checklists were also updated: <ul style="list-style-type: none"> <li>• 410-55-0400-C_001</li> <li>• 410-55-0400-C_003</li> <li>• 410-55-0400-C_004</li> <li>• 410-55-0400-C_005</li> </ul>
723-55-B Rev 1 Fire Pumps	Supersedes: 723-55-B Rev 0.

**DOE TECHNICAL STANDARDS ACTION**

Tech Stds Program [postings](#) in the past month: None

**NATIONAL STANDARDS ACTION**

**Learn about IEEE resources with a new series of videos**

Do you use IEEE resources on a regular basis? Are you curious about how IEEE Xplore works? The Institute of Electrical and Electronics Engineers (IEEE) has created a series of videos for LANL employees to watch and learn more about what IEEE has to offer. There are four videos that do a thorough walkthrough of IEEE Xplore and all the resources and tools available on it. Full details can be found at our Research Library blog post on the videos: <https://librarynews.lanl.gov/?p=2667>

**LANL's IHS Eng Workbench online codes & standards subscription news:**

NOTE: Access to **IAPMO** has been interrupted. The library hopes to have the situation with IHS resolved this week.

Document number: ACI 318  
Publication Date: June 2019  
Title: Building Code Requirements for Structural Concrete (ACI 318-19) Commentary on Building Code Requirements for Structural Concrete (ACI 318R-19)  
Type of Change: Errata/Erratum

Document number: ASHRAE 55 ADD D  
Publication Date: 7/31/2020  
Title: Thermal Environmental Conditions for Human Occupancy  
Type of Change: Addenda/Addendum

Document number: ASME B31.1  
Publication Date: 9/30/2020  
Title: Power Piping  
Type of Change: Complete Revision

**WHEN GOOD CONDUCT OF ENGINEERING ISN'T FOLLOWED**

**[Kanye West reveals new affordable housing prototype](#)**

Egomaniac, entertainer, running for president, sketchy real estate...hmm, that's oddly familiar. When I first saw this photo I thought Kim was the inspiration; nope—Star Wars (guess I'm not a huge fan of either).

U.S. rapper [Kanye West revealed his revamped housing prototypes in Calabasas, Calif.](#) The original prefabricated structures were deemed to be in **violation of the building code by Los Angeles County Department of Works inspectors** and were demolished.



*West has modelled the homes on residences featured in the Star Wars films.  
Photograph courtesy of TMZ*

### **LAST MONTH'S UPDATE TOPICS**

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

- **Make Suggestions to LANL Standards!**
- **Training & Qualification**
- **LANL Standards Issued in July or so**
- **Policy Documents Updated**
- **Engineering Processes News**
- **DOE Technical Standards Action**
- **National Standards Action**
- **When Good Conduct of Engineering Isn't Followed**

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To request a change to this newsletter's distribution, please contact me.

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