ENGINEERING STANDARDS UPDATE

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

Topics this month:

- **New Software Chapter 21!!!**
- **Variance Process Changed**
- **Self-Perform Specs**
- **IHS Standards -- IES RP-1; Older ASME**
- **Engineering Fundamentals Self-Study Guides**
- **Training**
- **LANL Standards Issued in June**
- **National Standards Changes**
- **DOE Technical Standards Actions**
- **When Good Conduct of Engineering Isn't Followed**

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

NEW SOFTWARE CHAPTER 21!!!

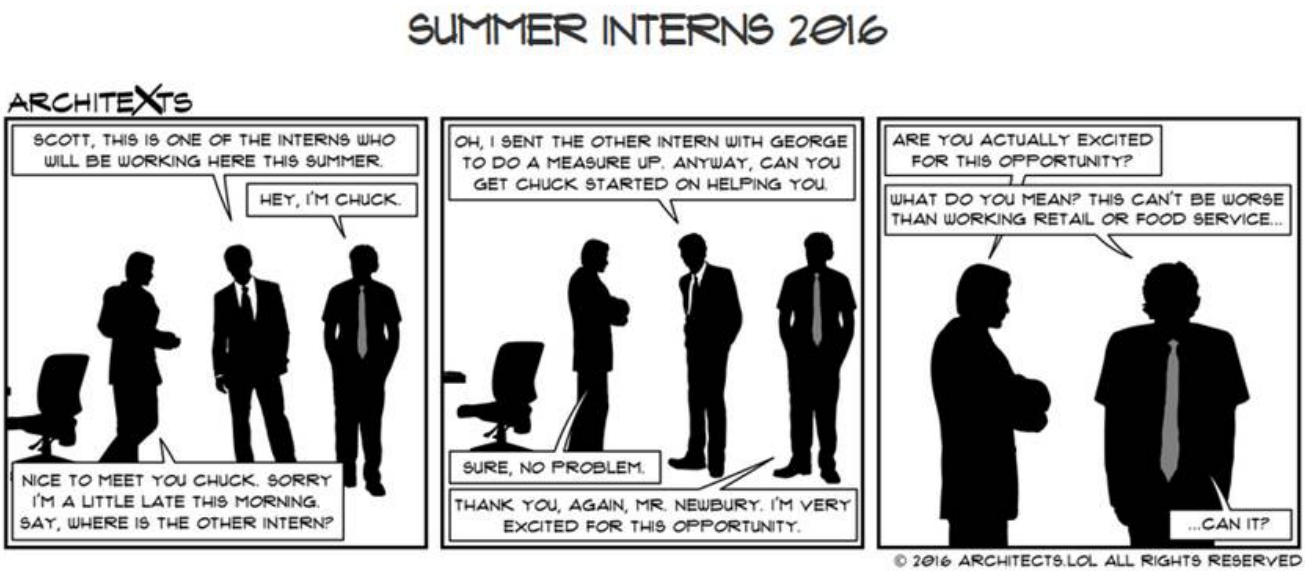
The new ESM chapter on software was released June 23. Its initial, provisional nature means its use is optional until changed to mandatory a few months from now. It represents the Standard Program's first deep dive into new territory since we issued Chapter 17 Pressure Safety in 2009 (Chapter 18-19 on communication were mostly existing material). Pretty exciting!

For LANL users (mostly ES and Safety Basis Divisions), Chapter 21 is a fairly complete admin program (not only technical requirements), thus similar to the Pressure, Welding, and IBC programs.

For our AE partners, Chapter 21 sets expectations for design and analysis software QA and design deliverables for SSCs that use software.

The chapter has six major sections (the first, SOFT-GEN, explains this), as well as forms, instructions with examples, and references (more examples). Access Chapter 21 here.

Training development has begun by Mike Brazile and an intern, Leigh Baca. We hope she has a good experience with this, just as we hope all interns do while helping us and learning. Here's one for the new interns that may be wondering what they've gotten themselves into at this point:



FYI, Chapter 20 is reserved for Systems Engineering, and with Chapter 21 issued it's moving up in the work queue.

VARIANCE PROCESS CHANGED

On June 23 we changed the old 2137 form hyperlink over to our document numbering/collaborative form development process. Now, when a new Variance or Alternate Method is needed, you'll need to check out a VAR number from the CoE Document Numbering site (directly here). This triggers creation of a folder for that VAR along with the new 2137 Word template by the system admin (normally Christina Salazar-Barnes), and an explanatory email to the requestor. After requestors' drafting of (and collaboration on) that Word file and uploading of any attachments, they notify the admin with a simple workflow and she takes it from there -- creates a single pdf, routes it for electronic signature, issues it to stakeholders, and periodically uploads files to EDMS

Old 2137 forms that are in-process (no emergent issues) will continue to be accepted for one month -- through July 22. Revisions of old-form VARs may use the old form.

SELF-PERFORM SPECS

I covered this last month, but it's important enough to warrant a bit more.

To help reduce paperwork and churn involved with construction work by LANL craft, a new spec master was introduced. It's Section 01 1117 R0 Work by Owner--Self Perform, and please begin including it when LANL craft will be doing some or all of the work. Major concepts:

1. For ML-4, takes the submittal reduction concept above a step further by AUTOMATICALLY eliminating a subset of lower-risk submittals, forcing design agency action to retain using a special statement.

2. Eliminates (or delays timing of) a few, selected submittals REGARDLESS OF ML.

3. Addresses the use of CBOMs and their role in offsetting traditional submittals.

4. Translates terminology in the specs and submittal schedule.

IHS STANDARDS -- IES RP-1; OLDER ASME

Responding to customers, the Research Library has added access to ANSI/IES RP-1, *American National Standard Practice for Office Lighting*, and the ASME Historical Standards collection in the IHS Standards Expert platform.

Access to the latest RP-1 is fine for the Sparkheads, but choosing standards is like choosing fashion--sometimes you don't want the latest. Now, LANL Gearheads, QA Wonks, and others can access prior versions of the ASME codes and standards, not just the latest. That's useful since, for example, for ASME NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications*, LANL still follows the NQA-1-2008 with NQA-1A-2009 addenda (not the latest/2015). So be sure to uncheck the filter for Most Recent Revision when searching for NQA-1. This is just like you should when searching for the 2012 IAPMO UPC or UMC we still follow vice the latest.

As a reminder, all ASME B&PVC editions are still accessed from the Table of Contents tab, not the search tab.

Finally: The license for these standards is for single simultaneous user access -- only one person at a time can view the full text of the document. Users are reminded to close the document and log out of IHS once they have completed a download, print, save or other use of the item. This will release the license for the next user. Please contact library@lanl.gov with any questions on the IHS Standards Expert platform.

ENGINEERING FUNDAMENTALS SELF-STUDY GUIDES

Any LANL-ite needing a more knowledge on basic technical topics can now access some handy guides developed a few years ago in the following areas:

SELF STUDY GUIDE TITLE
Electrical Theory
Mechanical Science
Thermodynamics, Heat Transfer, and Fluid Flow
Instrumentation and Control (I&C)
Chemistry
Materials

They're webposted internally here. We're not set up for course credit on them as yet, but that may be coming in the future. Questions? Mike Brazile 665-8258.

TRAINING

For LANL courses, to register: Sign up via UTrain (AEs without crypocard via Yolanda Trujillo at 665-5696 or yjtrujillo@lanl.gov with Z number) -- and dis-enroll if you can't make it.

- On UTrain click on the "catalog" tab and select "advanced catalog search"
- Enter course number as the "ID", then "search"
- Add-to-do-list
- Go to your to-do-list and click on 'register'

Electrical Standards Course THIS Thurs, July 7 (NOTE DATE CHANGE)

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 on Thurs, July 7, 8am-12pm, White Rock Training Center (TA00-B1308-112).

Standards Intro Course Thursday, Sept 8

This is the rescheduled date for the course I couldn't teach last week, and those folks were booked into this one so there's no space and a long waitlist. 8 a.m.– 4 p.m. in Canyon Complex (TA-00-199) Rm 172.

NFPA 101 Life Safety Code Essentials, Aug 23-25

Course 31667, WRTC.

CGD Courses Wed, August 24

For those that do work for nuclear facilities, the CGD Overview course (30726) runs from 8 to 10 a.m. is for those who require just an overview of the new CGD Process – plus those who will perform as CGD Preparers. The CGD Preparers' course (30727) is for those who will perform that role and runs from 10:00 a.m. to 5:00 p.m. Thus, CGD Preparers must attend both the CGD Overview and CGD Preparers courses to serve as CGD Preparers. Primary Instructor: Marshall Bullock, Lead Procurement Engineer. Happening at TA-00 Building 0199 Canyon School Complex Classroom 172.

IBC 2009 to 2015 Transition Training Sept 9

For those that missed this course here last summer and need it, you can pay to go to an AIA-hosted course in ABQ on September 9 (info here, early bird by Aug 18). This course reviews the changes from the 2009 edition to the 2015 International Building Code. The background behind many of the changes will be discussed to provide the participant with an understanding of the intent of the changes and how to apply it to their everyday work. Subjects covered will include the code change process, mixed occupancies, atriums, accessible means of egress and many more.

NEWLY LISTED: SWAGELOK SEMINARS JULY 27 OR 28 (NOT A LANL COURSE)

Swagelok Southwest (formerly Arizona/Albuquerque Valve & Fitting) is hosting free seminars at the White Rock Hampton Inn (124 State Highway 4) on July 27thth and 28th. Below is an outline of the seminars and you can attend any or all of the classes you want. They are teaching for two days with each day being a mirror of the other so that hopefully scheduling conflicts can be avoided. They also say:

"These seminars are designed for all levels of experience and include hands on learning which will help to ensure trouble free system performance. We will also share trade secrets with the group in order to have more efficient installations. We do these classes to help educate our customers.

Please let me know if you would be interested in one or more of the classes listed below and feel free to welcome others to the class. We do try to limit the classes to about 16 people per session. If interested, drop me an email at randy.huggard@swagelok.com or call on my cell (505)379-7300 and let me know which classes you would like to attend.

Improve the overall safety of the work environment, increase productivity and keep abreast of the latest fluid system technologies.

The same material will be presented on Wednesday, July 27th and Thursday, July 28th:

9am-11am: Swagelok Safety Installation Seminar for Fittings and VCR, Thread Identification.
This seminar is intended to familiarize end users and purchasing professionals about the proper use of tube fittings and VCR fittings installation, trouble shooting and mechanical function of the fittings are discussed. We will familiarize students with techniques to identify threads.

11am-12pm: Swagelok Valve Selection & Safety Installation Seminar
This seminar is intended to familiarize end users and purchasing professionals about valve selection, evolution of design, design advantages, and installation.

12pm-1pm: Lunch (lunch to be provided):

1pm-2pm: Swagelok Regulator Safety & Selection Seminar
This seminar is an overview of common regulator types and will also discuss proper operation, sizing, and safety concerns.

2pm-2:30pm: Swagelok Hose Safety & Installation Seminar
This seminar is an overview of hose products available in industry and how to properly install, troubleshoot and assemble hoses on site.

2:30pm-4:00pm: Swagelok Tube Bending Seminar
This seminar will discuss proper setup of the Swagelok Tube Bender, layout, and bending techniques. The user will be exposed to tube bending techniques that will allow them to install tubing runs more efficiently and confidently."

LANL STANDARDS ISSUED IN JUNE

ESM STD-342-100	
Ch. 17, NASME, Reputable Manufacturers	Updated list
Ch. 21, Software	Initial issue as provisional document.

Master Specifications STD-342-200	
01 3300 R5 Submittal Procedures	Made electronic submittals default approach, returned status codes to Exh I/DRS scheme, made forms into FM01-FM03.
03 3000 R10 Reinforced Concrete	Replaced pre-approved mix designs 15 and 15X with 5000-4N and -8E and added prefacing authors note regarding if/when mass-concrete requirements might apply to use of these. Revised cylinder requirements at 3.11.C.6. Clarified authors notes at 1.5.E, 2.2.I, and 2.7.C. Thanks to POC Glen Pappas.
21 2223 R0 Fixed Aerosol Fire Extinguishing System	Initial issue aka NEW. Thanks to Mark Rosenberger et al.

CAD Standards Manual STD-342-300	
VAR-10016, Sketch Requirements (and panel schedule guidance)	Posted 6/29/2016

NATIONAL STANDARDS CHANGES

Here's a selection of updates.

ASME has released ASME B31.1-2016 and B31.5-2016 and they're now on IHS. The B31.1 official date of issue is June 30, and the B31.5 official date of issue is June 29. ASME codes state that they become effective (mandatory) six months after the Date of Issuance, so that's essentially Jan 1, 2017 for both (when you're sleeping it off).

ESM Chapter 1 Section Z10 covers which edition to follow by stating "ASME codes allow a six-month implementation period, so if a LANL project code of record date is more than six months after the date of ASME code issuance, then the new code edition shall be the code of record (and may be adopted sooner)."

DOE TECHNICAL STANDARDS ACTIONS

DOE Tech Stds activity in the past month: None.

WHEN GOOD CONDUCT OF ENGINEERING ISN'T FOLLOWED

Apropos to the issuance of ESM Ch 21 Software, this month's CoE lesson is a serious one related to software.

Risk Assessment: Accident

- On February 25, 2009, Turkish Airlines Flight 1951 crashed short of the runway while attempting to land at Amsterdam Schiphol Airport on a flight from Istanbul, Turkey.
- Nine people were killed in the accident, including all three pilots.
- The accident report identified several factors leading to the crash, including the aircraft's automated responses to sensor failure, crew actions, and training.

- As the aircraft was landing the left radio altimeter suddenly indicated an erroneous value of -8 feet.
- The autothrottle software should have handled this error and switched to the right radio altimeter. Negative values instead activated a computer system mode that set the engine thrust to IDLE.

- The aircraft lost speed, and the crew did not recognize the problem until it was too late.
- The risk of losing a radio altimeter had been evaluated prior to the accident based on failure data; the calculated risk fell below that necessary for corrective actions. However, the risk was calculated based on total flight hours instead of exposure time during the landing phase.

- Software and computing system risks are often underestimated because of misunderstandings of complexity and false assumptions.
- Realistic risk assessments must include sensor (input) failures and effector faults in addition to software errors.
- The preconditions for mode change must be analyzed and understood.
- Effective testing must be implemented and include off-nominal conditions to validate risk assessments.

From: Case Studies in Software and Computing System Safety: Accidents and Lessons Learned, Terry Hardy NASA GSFC Systems Engineering Seminar, August 2, 2011

LAST MONTH'S UPDATE TOPICS

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

- **Self-Perform Specs**
- **Variance Process Changing June 22**
- **ESM Software Chapter 21**
- **Training, Training, and More Training**
- **LANL Standards Issued in May**
- **National Standards Changes**
- **DOE Technical Standards Actions**
- **Building Safety Month**
- **When Good Conduct of Engineering Isn't Followed**

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