# ENGINEERING STANDARDS UPDATE

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

## Topics this month:



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

## STANDARDS INTRO COURSE OCT 28

Don't wait! This is only offered a couple of times a year, and the next is October 28, from 8 a.m.–4 p.m. in Canyon Complex Rm 172. Provides familiarity with national and LANL engineering standards for anyone performing, reviewing, or managing design activities. Many LANL engineers and designers are required to take it, and outside AEs are encouraged to attend.

Over 1000 people have taken this over the last dozen years in 35+ sessions. Not bad, although McDonald's has served over 200 billion.

To register: Sign up via UTrain (AEs without crypocard via Yolanda Trujillo at 665-5696 or yjtrujillo@lanl.gov with Z number)

- On UTrain click on the "catalog" tab and select "advanced catalog search"
- Enter Item Number 24140 as the "ID", then "search"
- Add-to-do-list
- Go to your to-do-list and click on 'register'

## ELECTRICAL STANDARDS COURSE NOV 4

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 Wednesday, Nov 4, 8am-12pm, White Rock Training Center (TA00-B1308-112). Enroll same as above.

## VARIANCES AGAINST SPECS

Here are three tips for LANL folks requesting a variance against a LANL Master Spec section:

1. Form 2137 must be written against the relevant LANL Master Spec revision/wording, not any project spec revision number/wording.

2. The justification needs to clearly and convincingly explain why the proposed alternative to meeting the institutional requirement should be accepted. A weak justification is cause for rejection (true of all variances). Repeated failure to follow standards or write 2137s well is cause for time off without pay (not true, but should be).

3. When the spec matter is only a Standards POC preference, the approver is only the POC; the Safety Management Program Owner (Larry Goen 99% of the time) need not sign and that field is N/A (the exception is ML-1/2 Masters where Larry always signs). This is a Type 1 variance per Table Z10-2 in ESM Chapter 1 Section Z10:

**Table Z10-2 Standards Amendments: Clarifications, Interpretations, Alternates, and Variances —Methods, Approvals, and Appeals**

| | **Requirement Type** | | | | | |
|---|---|---|---|---|---|---|
| | **TYPE 1**<br>• ***Not ESM**,***<br>• **POC preference (not Type 2 or 3), and**<br>• **Not for ML-1 or 2** | | **TYPE 2**<br>• **ESM and**<br>• **SMPO preference (not Type 3)** | | **TYPE 3**<br>**NNSA Contract-mandated and not delegated to LANL** | |
| | **Method** | **Approving Authority** | **Method** | **Approving Authority** | **Method** | **Approving Authority** |
| **POC Help** | Phone or Email | | | | | |
| **Amendments** | | | | | | |
| **Formal Clarification or Interpretation** | Form 2176 | POC | Form 2176 | Design Authority | Form 2176 | Design Authority |
| **Alternate Method or Variance (Type 1 or 2)** | Form 2137 | POC | Form 2137** | Design Authority | N/A | N/A |
| **Equivalency or Exemption (Type 3)** | N/A | N/A | N/A | N/A | Form 2137***<br>+<br>P 310-1, *Exemptions to Appendix G Requirements or* 10CFR851 variance website; etc. | DOE Los Alamos Field Office or higher |
| **But if work contrary to Standards is submitted for acceptance…** | …then an NCR is normally required. When NCR use-as-is or repair disposition is proposed, an amendment per above is also required with NCR to involve institutional requirement owner. | | | | | |

* Not-ESM examples: LANL Master Spec, Std Detail, Std Procedure, CAD Stds Manual, Welding Procedure Spec
** VSS: For ESM issues involving vital safety systems, a committee consisting of the CSE, FDAR, and POC will be convened (with invitation to LA Field Office to observe[22]) for review of request and recommend a disposition to the Design Authority.
*** Contract: A committee consisting of the requestor, FDAR, and POC will be convened (with invitation to LA Field Office to observe) for review of request and recommend a disposition to the Design Authority who will then decide to either deny the request or forward to the LA Field Office for action.[23]

## LANL STANDARDS ISSUED IN SEPTEMBER

| | |
|---|---|
| **Master Specifications** STD-342-200 | |
| 05 1000 R9 Structural Metal Framing | Rewritten and updated for compliance with latest revision to ESM Ch. 5 Sect. II (which was revised to comply with DOE O 420.1C, DOE-STD-1020, IBC 2015, etc.). |
| 05 3000 R3 Metal Decking | |
| 05 4000 R5 Cold-Formed Metal Framing | |
| 21 1313 R6 Wet-Pipe Sprinkler Systems | Updated seismic design requirements for IBC-2015 and anchor reference from division 03 to division 05. |
| 21 1316 R5 Dry-Pipe Sprinkler Systems | |
| 21 1319 R5 Preaction Sprinkler Systems | |
| 21 1326 R5 Deluge Fire-Suppression Sprinkler Systems | |
| 21 1339 R5 Foam-Water Systems | |
| **ESM** STD-342-100 | |
| Chapter 13, Vol. 6 - ITM-1306-NDE-VT-101 Rev. 1 | Added "or National Board Commissioned Inspector" and updated references. |
| **CAD Standards Manual** STD-342-300 | |
| CAD Manual Templates Rev. September '15 | Title Sheet and Title Block Template – a hyphen has been added to “TA-BLDG” for consistency with EDMS filing of DCFs etc.<br>Sketch Title Block Template – a missing revision number editable attribute has been added to the far lower right corner of the title block; the “FY” in the drawing number has been changed to “YY”; and a hyphen has been added to “TA-BLDG” for consistency with DCF/FCR/DRN document numbering |

## SLOGANS “R” US IN OCTOBER

Today is World Standards Day. Also National Fire Prevention Week/Month.



**ES DOCUMENT CONTROL HAS LEFT THE BUILDING (IN AN EMAIL WAY)**
But, like Elvis, can still be spotted— in this case, above Daniel's Café. From Brenda Zamora of the Document Control Team (665-7108):

The Document Control Team located at ES-EPD has been combined with the ADPM Projects Team lead by Ha Nguyen. Starting October 5, 2015, the es-dcrm@lanl.gov e-mail will no longer be valid. In order to ensure that your requests are responded to in a timely manner, please submit all Doc Control/Records requests to project-dcrm@lanl.gov.

Should you have any questions regarding this new process, please contact Ha Nguyen at 665-0428 or project-dcrm@lanl.gov

Thank you, Brenda and Johanna.

## ENGINEERING PROCESSES NEWS

A memo on CGD comp measures has been posted on the SharePoint site per Christina Salazar-Barnes' email(s). For most APs, Gurinder Grewal is onsite most Tuesdays and Thursdays if you have questions. For CGD, contact Marshall Bullock or Bill Kerley.

## DOE TECHNICAL STANDARDS ACTIONS

DOE Tech Stds activity in the past month:

| | |
|---|---|
| DOE-STD-1207-2012 | Protection Programming Defensive Planning for Fixed Facilities Change Notice 1 (September 2015). This document provides Department of Energy (DOE) field offices and associated facilities/sites with a standard methodology for adapting the Department's tactical doctrine to site-specific needs in a coherent, consistent, and repeatable fashion. |
| DOE-STD-1213-2014 | Protective Force Contingency Planning Technical Standard Change Notice 1 (September 2015). This Technical Standard outlines the responsibilities, planning considerations, training, management oversight, and other activities related to establishment of a Contingency Protective Force. |
| DOE-STD-1129-2015 | Tritium Handling and Safe Storage. This Standard provides useful information for establishing processes and procedures for the receipt, storage, assay, handling, packaging, and shipping of tritium and tritiated wastes. It includes discussions and advice on compliance-based issues and adds insight to those areas in which DOE guidance is unclear. It is intended to be a "living document" that is revised periodically. |

## WHEN GOOD CONDUCT OF ENGINEERING ISN'T FOLLOWED

Last month's Update had a photo of a truck/trailer that hit a railroad bridge. Clay Davis noted that railroads are infamous for odd underpass clearances and many date to the early part of the last century. One old trestle in Durham, NC has been hit nearly 100 times just in the past 7 years and now has its own web cams and website: http://11foot8.com

This month's humor is an oldie but goodie, with minor updates:

**4 Feet 8.5 Inches — true and really interesting! You'll love the logic here.**

The U.S. Standard Railroad Gauge (distance between the rails) is 4 feet, 8.5 inches. That's an exceedingly odd number. Why was that gauge used? Because that's the way they built them in England, and English expatriates designed the U.S. Railroads.

Why did the English build them like that? Because the first rail lines were built by the same people who built the Pre-Railroad Tramways, and that's the gauge they used. Why did 'they' use that gauge then? Because the people who built the tramways used the same jigs and tools that they had used for building wagons, which used that wheel spacing.

Why did the wagons have that particular odd wheel spacing? Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because

that's the spacing of the wheel ruts. So, who built those old rutted roads? Imperial Rome built the first long distance roads in Europe (including England) for their legions. Those roads have been used ever since. And the ruts in the roads? Roman war chariots formed the initial ruts, which everyone else had to match for fear of destroying their wagon wheels.

Since the chariots were made for Imperial Rome, they were all alike in the matter of wheel spacing. Therefore, the United States standard Railroad gauge of 4 feet, 8.5 inches is derived from the original specifications for an Imperial Roman war chariot.

In other words, bureaucracies live forever. So the next time you are handed a specification, procedure, or process, and wonder, 'What horse's ass came up with this?', you may be

exactly right. Imperial Roman army chariots were made just wide enough to accommodate the rear ends of two war horses.

Now, the twist to the story:

When you see a picture of the Space Shuttle sitting on its launch pad, you will notice that there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs. The SRBs were made by Thiokol at their factory in Utah.

The engineers who designed the SRBs would have preferred to make them a bit larger, but the SRBs had to be shipped by train from the factory to the launch site. The railroad line from the factory happens to run through a tunnel in the mountains, and the SRBs had to fit through that tunnel.

The tunnel is slightly wider than the railroad track, and the railroad track, as you now know, is about as wide as two horses' behinds.


So, a major space shuttle design feature of what was arguably the world's most advanced transportation system was determined more than two thousand years ago by the width of a horse's ass.

*Now you know: Horses' asses control almost everything... Explains a whole lot of stuff, doesn't it?*

## LAST MONTH'S UPDATE TOPICS

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

- **LANL Standards use of "Project"**
- **IBC/IEBC Training Caution**
- **I-Code Errata**
- **Standards Intro Course Oct 28**
- **National Standard Committee Participation**
- **Building Codes Around the World**
- **Renewable Energy Standards and Patents**
- **Engineering Processes News**
- **LANL Standards Issued in August**
- **DOE Technical Standards Actions**
- **When Good Conduct of Engineering Isn't Followed**

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

Tobin Oruch, Engineering Standards Mgr
Los Alamos Nat'l Lab, Conduct of Eng Program Office
TA-03-0216 M/S F696 ph (505) 665-8475
oruch@lanl.gov http://engstandards.lanl.gov/
*Please consider the environment before printing this or any email*