ENGINEERING STANDARDS UPDATE
Trying to Make Standards Exciting Since 2001

This is the monthly newsletter of the LANL Conduct of Engineering Office's Engineering Standards Program. The Standards define the minimum technical requirements for the design, fabrication, construction, commissioning, repair, and replacement of both new and existing equipment and facilities, including both maintenance and modification, for programmatic and facility work at LANL [PD340].

Topics this month:

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

WILDLAND FIRE AND CODES

First, many thanks to those working the Las Conchas fire, and condolences to those who lost property. As most know, this ongoing fire threatened -- but was generally held away from -- land belonging to the Lab. This is in direct contrast to the Cerro Grande Fire of 2000 that burned a sizeable area of LANL vegetation and a few structures (and, tragically, 400 residences in the townsite).

Why the difference at LANL this time? Per Fire Marshal Jim Streit, mostly the combination of less fuel near the site boundary and favorable weather (wind) that allowed sufficient time for effective defensive tactics including back burn-outs and tactical firefighting. The fuel reduction was a result of the 2000 fire itself, and other post-fire efforts to mechanically thin forested areas, establish stronger fire breaks, and better defensible space. Had more fire reached Lab property, the brush and tree thinning accomplished by the Cerro Grande Rehabilitation Project would have made it more manageable. And should a fire ever approach Lab buildings, they would be largely protected by the fuel reduction areas dictated by the International Wildland-Urban Interface Code and NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire. Finally, the type and materials of construction specified for LANL buildings by Engineering Standards Manual (ESM) Chapter 2, Fire Protection, help ensure structure survival (especially true of nuclear facility construction).

Credit: Craig D. Allen, USGS

2009 CODE ADOPTIONS

With the revision of ESM Chapter 16 (IBC Program) on June 20, LANL adopted several 2009 ICC codes for new buildings and modification and repair of existing – i.e., the International Building and Existing Building Codes. Also, we now follow the 2009 IECC for energy conservation when the LEED and CFR requirements in ESM Chapter 14 do not apply. In addition, we have adopted the 2009 Uniform Plumbing and Mechanical Codes (UPC, UMC). This is consistent with the State of New Mexico that required designs to be per the above codes starting July 1. All of these codes are available online via the Research Library's IHS subscription, and I have a few hardcopies.

Building code adoptions are shown in Chapter 16 Section IBC-GEN's Appendix A, LANL Building Code -- our amendments to the IBC. IBC-GEN itself has also been revised to more clearly define in-IBC-scope and out-of-scope work in new tables and a revised flowchart, simplify special inspection designation, add a form for designation of the Design Professional in Responsible Charge, and other changes.

Finally, ESM Chapter 5, Structural, has been revised. Section I, General Criteria, was revised to better address designated seismic systems; its new Appendix A describes when and how to anchor equipment and components. Section II, now titled Commercial Design and Analysis Requirements, provides LANL's amendments to the 2009 IBC's structural chapters. There's also an all-new Section II commentary document that will help with implementation. Lastly, Section III, now titled Nuclear Design and Analysis Requirements, addresses DOE-STD-1189 (e.g., SDCs, limit states) and contains the new TA-55 seismic response criteria.

2009 CODE TRAINING

These two, free courses are a rare and not-to-be-missed opportunity that will not be taught again for several years. Managers should ensure enrollment when applicable (registration lists are available from yjtrujillo@lanl.gov).

Note: After enrolling for these courses, you should receive a confirmation email from Yolanda within a couple of days. If you did (or do) not, try again. You should also get a reminder about a week prior to the session.

IBC Fundamentals Nonstructural Provisions: Tues, July 26, 8:00-3:30 (6 contact hours)
This seminar from the International Code Council focuses on the basic nonstructural concepts of the 2009 *International Building Code* (IBC). These concepts will provide a basis for the correct utilization of the code and a clear understanding of the identified requirements which allows the code user to apply the IBC in specific situations and helps build an understanding of the intent of the code. Workbook included.
Instructor: John M.. Gibson, Jr. M.C.P., C.B.O.,C.P.C.A.,C.F.M. Technical Advisor and Instructor for the International Code Council (ICC). A Certified Master Code Professional and Certified Fire Marshal, he has 40 other certifications including 33 from the ICC.
Registration: Enroll or disenroll in EDS Course 57170 online here; others contact Yolanda Trujillo at 665-5696 or yjtrujillo@lanl.gov
Location: Physics Auditorium, currently.

IEBC Fundamentals: Wed, July 27, 8:00-3:30 (6 contact hours)
For building modifications, repairs, additions, changes of occupancy, and relocations. Discusses critical concepts of the 2009 International Existing Building Code® (IEBC®). It will provide a basis for the correct use and application of the code, and build an understanding of the intent of the code through detailing basic tables, categorizations and case studies (including LANL examples).
The rest: Same as above, but EDS#57291 (online here).

CONDUCT OF ENGINEERING CORE COURSES

Per CoE T&Q Grand Poobah Lyle Kerstiens, Project Engineering Overview 43668 will be taught July 20 in the MSL Auditorium from 1-3pm. Enroll or disenroll here; non-LANL can contact Yolanda Trujillo at 665-5696 or yjtrujillo@lanl.gov

NEW LAB PROCEDURE -- CONDUCT OF ENGINEERING PROCESSES FOR R&D -- P_341-1

The purpose of this document is to describe how standardized Conduct of Engineering (CoE) processes are applied during the performance of Research and Development (R&D) activities. Issued as a PROVISIONAL (not mandatory) document until October 14, 2011. Comment to Heidi Hahn in ADE, who's honchoing this.

NEW ENGINEERING SCIENCE BLOG DEBUTS

Comments sought on Engineering Strategy for the Future

Per LANLtoday, 6/22:

> Steve Girrens, associate director for Engineering and Engineering Sciences, recently launched a new Engineering Science blog as a place for all LANL engineers to "connect, discuss, and improve their capabilities, collaboration, and innovation." Girrens is asking for feedback on his initial thoughts and the brief summary of Engineering Strategy for the Future noted in his blog entry. To view the blog and provide comments, go to http://blog.lanl.gov/engineeringscience/.
>
> The blog is mapped to the LANL National Security Science institutional goal at LANL Blogs http://int.lanl.gov/news/social_media/internal_social_media.shtml.

I read the blog and think it deserves a look by readers. Read from the bottom up.

LANL STANDARDS ISSUED IN JUNE

LANL Engineering Standards Manual (STD-342-100)

Chapter 1 - Section Z10, Rev. 10	Use of interps, using latest referenced stds, order of precedence; moved D&D of existing to IBC-GEN; added PE graphic, task/job vice project
Chapter 1 – Section 100 Manual Administration Appendix A - Approval Signature Sheet	Added line on EPA and posting reference at bottom
Chapter 5 - Section I, Rev. 6	Added requirements for Designated Seismic Systems, updates for consistency with Section III, updated references, Appendix A on anchoring.
Chapter 5 - Section II, Rev. 6	Updated for IBC 2009 and various administrative changes including document number. Added commentary on design and inspection.
Chapter 5 - Section III, Rev. 5	Major revision. Added 1189 requirements, removed PC-4 requirements; new response spectra.
Chapter 9, Security	Limited Area Fencing Requirement Reduction Variance 2011-089
Chapter 13, WPS 9000CD100-8 Rev. 0	Initial issue.
Chapter 16 - IBC-GEN Rev. 6	Scope clarified (tables); SSI need not include other inspections. Transportainer anchorage, 2009 I-Codes adopted, moved D&D from Z10 and clarified. Changed Appendix A & B, Forms 01, 02, 03
Chapter 16 - IBC-IP Rev. 6	SSI need not include other inspections.
Chapter 16 - IBC-FAB Rev. 6	Clarified that spot checks may be done anytime.

LANL Master Specifications (STD-342-200)

03 1534 R3, Post Installed Concrete Anchors Purchase-Normal Confidence	change re material for wet locations, ML-3 possibility, LBO approval info, ESR numbers
03 1550 R3, Post Installed Concrete Anchors-Installation and Testing	Appendix A revised
26 4123 Lightning Protection Surge Arrestors and Suppressors	Cancelled. Superseded by 26 4300
26 4300 R0 Surge Protective Devices	This issue correlates with ANSI/UL 1449 – UL Standard for Safety for Surge Protective Devices, 3rd Edition and Article 285 in the 2011 National Electrical Code. Lightning protection surge arresters and transient voltage surge suppressors essentially have been combined into one category.
26 4313 Transient Voltage Suppression for Low-voltage Electrical Power Circuits	Cancelled. Superseded by 26 4300

DOE TECHNICAL STANDARDS ACTIONS

New or Revised DOE Tech Stds this past month
DOE-STD-1194-2011, Nuclear Materials Control and Accountability. Coincides with recent issuance of DOE O 474.2, Nuclear Material Control and Accountability.
DOE-STD-1172-2011 Safety Software Quality Assurance Functional Area Qualification Standard [for Feds]

COE QUOTE OF THE MONTH

Engineers...are not superhuman. They make mistakes in their assumptions, in their calculations, in their conclusions. That they make mistakes is forgivable; that they catch them is imperative. Thus it is the essence of modern engineering not only to be able to check one's own work but also to have one's work checked and to be able to check the work of others.
- Henry Petroski, "To Engineer Is Human." Engineers Creed

WHEN CONDUCT OF ENGINEERING ISN'T FOLLOWED

Sometimes, LANL building inspectors get push-back on wind anchorage for construction trailers. To better understand why the code requires anchorage, watch this circa-November video of trailers in a tornado – gone in a split second. Anchorage won't make trailers safe in high-category tornado and it's not required for RVs by the IBC, but here's a photo of what happened to a CoE-family relative's trailer on May 23 in Espanola. It wasn't a particularly windy afternoon, but a 30-40 foot dust/dirt devil came into his yard and rolled his camper over onto its roof as he watched. Luckily no one was hurt.

Trailer anchorage requirements are in ESM Chapter 16 Section IBC-GEN under "Temporary Facilities."

ENGINEERING JOKE OF THE MONTH

In recognition of our summer students.
Top 10 Things Engineering School Didn't Teach You

1. There are at least 10 types of capacitors.
2. Theory tells you how a circuit works, not why it does not work.
3. Not everything works according to the specs in the databook.
4. Anything practical you learn will be obsolete before you use it, except the complex math, which you will never use.
5. Engineering is like having an 8 a.m. class and a late afternoon lab every day for the rest of your life.
6. Overtime pay? What overtime pay?
7. Managers, not engineers, rule the world.
8. Always try to fix the hardware with software.
9. If you like junk food, caffeine, and all-nighters, go into software.
10. Dilbert is not a comic strip, it's a documentary.

LAST MONTH'S UPDATE TOPICS

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

- **Staycation at LANL!**
- **IBC and IEBC Classes**
- **LANL Standards Issued in May**
- **DOE Technical Standards Actions**
- **CoE Quote of the Month**
- **When Conduct of Engineering Isn't Followed**

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

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