Engineering Standards Update

News from Engineering Standards Program

Nov 4, 2024

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

Topics this month:

AGS AND LASER SAFETY STANDARDS AVAILABLE THROUGH RESEARCH LIBRARY

The Research Library now provides access to glovebox standards and procedures through American Glovebox Society (AGS) and Laser Safety standards through the ANSI website.

Standards available through AGS include:

- AGS-G006-2005: Design and Fabrication of Nuclear Application Gloveboxes
- AGS-G002-1998: Design and Fabrication of Glovebags
- AGS-G010-2011: Fire Protection
- AGS' Guide for Personnel Qualifications and Certification.

Standards available through ANSI/LSI include:

- ANSI Z136.1-2022 - American National Standard for Safe Use of Lasers
- ANSI Z136.2-2012 - Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources
- ANSI Z136.3-2024 - Safe Use of Lasers in Health Care
- ANSI Z136.4-2021 - Recommended Practice for Laser Safety Measurements for Classification and Hazard Evaluation
- ANSI Z136.5-2020 (errata) - Safe Use of Lasers in Educational Institutions - ERRATA SHEET
- ANSI Z136.6-2015 - Safe Use of Lasers Outdoors
- ANSI Z136.7-2020 - Testing and Labeling of Laser Protective Equipment
- ANSI Z136.8-2021 - Safe Use of Lasers in Research, Development, or Testing
- ANSI Z136.9-2013 - American National Standard for Safe Use of Lasers in Manufacturing Environments

For more information on how to access these standards, see article for AGS standards and article for Laser Safety standards.

NEW FIRE POC

Shaun Wrightson is the new Fire ESM POC; Greg Shino remains the Alternate. We thank Keenan Dotson for all his support to engineering standards work.

TRAINING & QUALIFICATION

Courses, Seminars, Programs

Note on Training Registration emails: When you sign up for a class in UTrain, you will receive an email that is generated by UTrain upon registration and again on the day of or before the class which will include the link to join the Teams meeting (for classes hosted online). **WARNING: To get the Teams link email you must register in UTrain. The email will NOT automatically enter an event on your calendar in Outlook. Please block your own calendar.** To receive credit for the course, you are required to log into the Teams meeting using a computer that has voice and chat capabilities (for classes hosted online). Do not use a mobile device to join the class; if you do so you will not be able to receive credit. For any questions, please email the Training team at es-do-tng@lanl.gov.

CoE ASME B31.3 Process Piping Code, #53900 – Nov 4-7, 11-14, 18 (M-Tr, must attend all 9 sessions), 2:00-3.30 pm, Teams

Ari Swartz is leading this instructor-led course to familiarize participants with ASME B31.3 Process Piping Code as related to the duties of a Pressure Safety Officer.

CoE Submittal Review for Design Engineers, #57893 – Nov 7, 9:00-10:00 am, Teams

This training, led by Eric Stromberg, covers submittal reviews.

CoE Types of Design Reviews, #50368 – Dec 5, 9:00-10:00 am, Teams

This training, led by Eric Stromberg, covers types of design reviews.

CoE Building Systems B31.9, #56239 – Dec 9-12, 16-19 (M-Tr, must attend all 8 sessions), 2:00-3.30 pm, Teams

Ari Swartz is leading this instructor-led course to familiarize participants with ASME B31.9 Building Services Piping Code and its real applications.

Onboarding Training Courses by CoE Office, Teams:

- COE ES LANL Organization and Engineering Divisions Introduction #54659, Nov 20, Dec 4, Dec 18, 10.30 - 11.30 am
- COE Engineering Initial Onboarding #54864, Nov 13, Dec 11, 10 - 10.30 am
- AP Introduction and Common APs Deep Dive #54871, Nov 5, Dec 3, 9.30 - 11 am.

FOD Fundamentals:

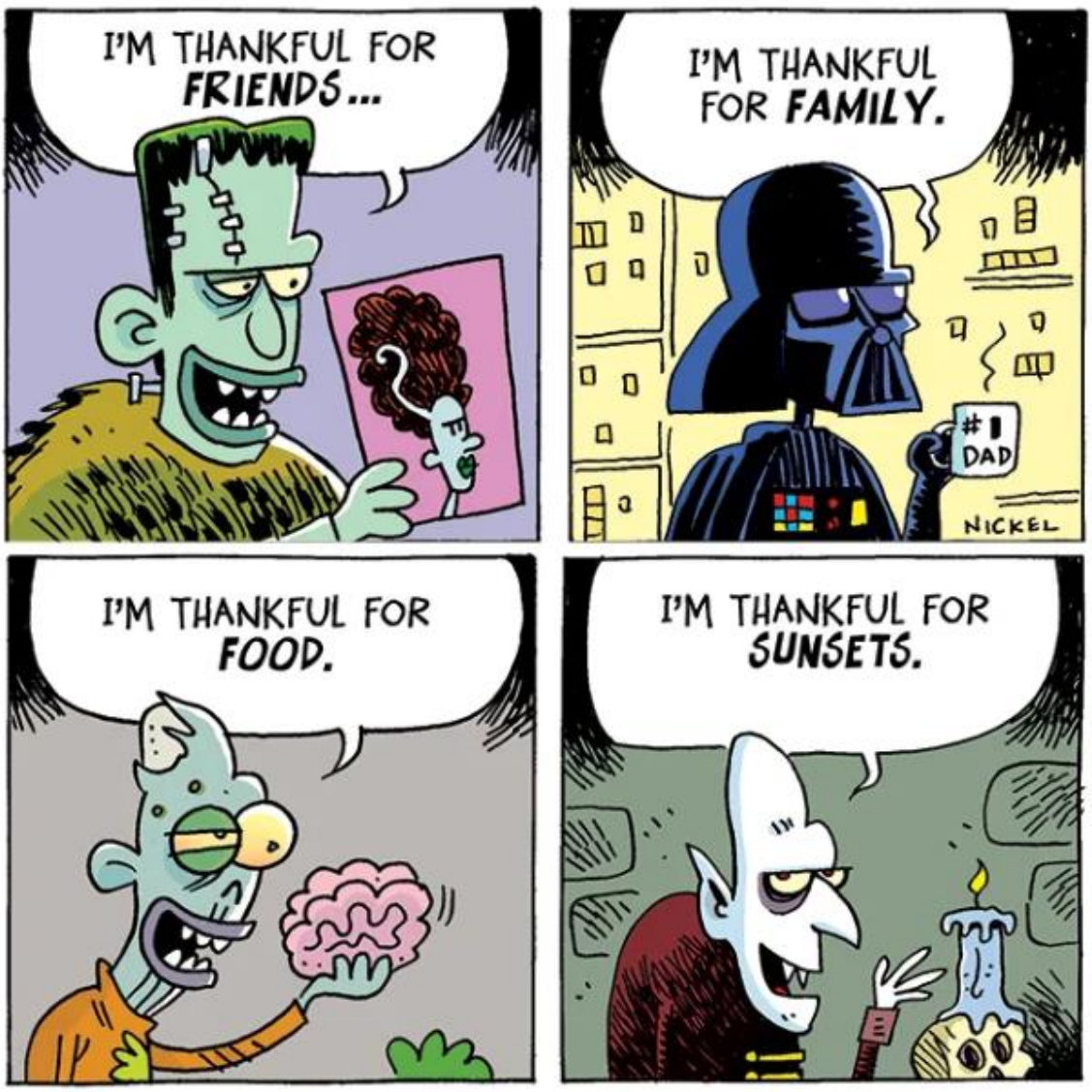
- FOD Fundamentals #1: LANL Organization & Facility Management - an Overview, #57288, Nov 19th, 10 – 11 am, MSL Auditorium
- FOD Fundamentals #2: Facility Service Request (FSR) and Work Execution Overview, #58435, Dec 4th, 2 – 3 pm, MSL Auditorium
- FOD Fundamentals #3: FOD Finances, #59870, Nov 18th, 10 – 11 am, MSL Auditorium.

T&Q Admin matters

E-mail for CoE Training: es-do-tng@lanl.gov
Click e-mail address above for help with COE training issues like getting registered, missing credit, etc. Goes to the whole team: Stan Hayes, Nick Jones, Sadonna Tapia, Santana Quintana, and Chris Martinez. Alternatively, visit the Engineering Services Training and Qualifications webpage by clicking the button "Email The Training Team". The Training and Qualifications webpage contains information and tools on training requirements and copies of the various Qualification Standards maintained by the COE office.

E-mail for CoE Qual Program: COEQuals@lanl.gov
Click e-mail address above for any help with COE quals such as CSE, PrE, Design, Project, PSO, FDAR, and other qualified positions (and also SHR matters for CSEs). Goes to Deb Cushner, Jess Blea, and Barb Dela Cruz.

Instructor-Led Course Request/Registration Guide
For live courses without a session in UTrain, there's a step-by-step guide posted to the CoE T&Q "Resources" page on how to request a course. This places the requestor on the waitlist and notifies the training team of interest for the said live course.



Comic by Scott Nickel

LANL ENGINEERING STANDARDS ISSUED IN OCTOBER

Engineering Standards Manual ESM STD-342-100

Chapter	Section	Title	Rev.	Date	Comments
ESM Ch 1 - General	200, 210 & 230, Attachment 1	CMMS Upload Workbook	1.9	10/8/2024	Thanks to 210 & 230 Lists POC Charles Nuss.

LANL Master Specifications STD-342-200
Thanks to Christina Salazar-Barnes for formatting these specification sections and Neha Gidwani for coordinating all these updates with the POCs!

Section Number	Rev.	Section Title	Effective	Comments
01 3300	7	Submittal Procedures	10/9/2024	Updated construction submittal code definitions, added user notes and examples on usage of codes, added guidance on partial submittals, added article on LANL Critical Review, aligned with 01 3300 Attachment A – Construction Submittal Log (May 2024), major re-structuring of Part 1, and moved articles from Parts 2 & 3 into Part 1. Thanks to General Alternate POC Neha Gidwani, Acting LSME PE Logan Tietjen, et. al.
01 3300 FM01	1	Submittal Transmittal	10/9/2024	Revised form aligning with 01 3300 R7. Thanks to Lead Field Engineer Tyson Cardon, General Alternate POC Neha Gidwani and Acting LSME PE Logan Tietjen.
01 3300 FM01-W	1	Submittal Waiver	10/9/2024	Revised form aligning with 01 3300 R7. Thanks to General Alternate POC Neha Gidwani and Acting LSME PE Logan Tietjen.
01 3300 FM02	1	Delegated Design Review Record	10/9/2024	Revised form aligning with 01 3300 R7. Thanks to General Alternate POC Neha Gidwani and Acting LSME PE Logan Tietjen.
01 3300 Resource	-	Construction Submittal Review Process (pdf)	10/9/2024	Provides guidance on construction submittal review workflow. Thanks to General Alternate POC Neha Gidwani and Acting LSME PE Logan Tietjen.
01 4444	3	Offsite Welding, Brazing & Joining Requirements	10/8/2024	Removed Examination requirements in this section, added reference to Section 01 4525 which addresses NDE, added minor clarifications and minor editorial updates. Thanks to Welding POC David Bingham, Tony Mecham, and NDE POC David Harvey.
01 4455	4	Onsite Welding, Brazing & Joining Requirements	10/8/2024	Removed Examination requirements in this section, added reference to Section 01 4525 which addresses NDE, and minor editorial updates. Thanks to Welding POC David Bingham, Tony Mecham, and NDE POC David Harvey.

22 0535	1	Electrical Heat Tracing Systems	10/21/2024	Added Articles *Related Sections* and *References*, and minor editorial updates. Thanks to Mechanical POC Michael Ladach and Alternate Mechanical POC Todd Smith.
23 2500	4	HVAC Water Treatment	10/21/2024	Added Articles *Related Sections* and *References*, added information for glycol treatment of systems that require freeze protection, deleted Attachment A (content from Attachment A will be transferred to ST-D30GEN-1 series), and minor editorial updates. Thanks to Mechanical POC Michael Ladach and Alternate Mechanical POC Todd Smith.
23 3400	2	HVAC Fans	10/21/2024	Added manufacturers' names for Plenum Fans, and minor editorial updates. Thanks to Mechanical POC Michael Ladach and Alternate Mechanical POC Todd Smith.
23 8239	2	Unit Heaters	10/21/2024	Updated manufacturer names, code/standard references, streamlined submittals and minor editorial updates. Thanks to Mechanical POC Michael Ladach and Alternate Mechanical POC Todd Smith.

LANL Engineering Standards Admin matters

E-mail for COE Eng Stds: engstandards@lanl.gov
Click e-mail address above for any general questions. Goes to the whole team: Tobin Oruch, Alan Yaeger, Neha Gidwani and Christina Salazar-Barnes. Alternatively, visit the CoE or Engineering Standards webpage and click on the email under the Engineering Standards team. Of course, if your need is discipline-specific, then it's best to contact the Standards POC for the corresponding ESM chapter shown on that webpage.

LANL ENGINEERING PROCESSES CHANGES

Document	Title	Rev.	Date	Comments
AP-341-720, Engineering Construction Submittals	Posted Variance: VAR 10696, Construction Submittal Status Code Definitions in AP-341-720 R0	0	10/9/2024	Thanks to Neha Gidwani and AP Manager Azupuri Kaba.

LANL Engineering Processes Admin matters

E-mail for COE Eng Processes: COE-APs@lanl.gov
Click e-mail address above for any questions related to Administrative Procedures. Goes to Azupuri Kaba (Kaba), Gabriel Herrera, Beau Portillo, and Christina Salazar-Barnes. Alternatively, visit the CoE or Engineering Procedures webpage and click on the email under the Engineering Processes team.

NATIONAL STANDARDS ACTION

Online National Codes & Standards (Accuris Eng Workbench [EWB], formerly IHS)

ASME B31.1, Power Piping
Publication Date: 10/15/2024 (per ESM Ch. 1 Section Z10, "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)").
Type of Change: Complete Revision

IAPMO UPC, Uniform Plumbing Code
Publication Date: 2024 (FYI, as LANL still uses the 2021 U-codes per ESM Ch. 16, IBC-GEN, Att. A)
Type of Change: Complete Revision

NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection

Publication Date: 2025 (LANL uses 2019 per ESM Ch. 2, Att. 1)
Title: Type of Change: Complete Revision

NFPA 30, Flammable and Combustible Liquids Code
Publication Date: 2024 (LANL uses 2021 per ESM Ch. 2, Att. 1)
Type of Change: Complete Revision

NFPA 72, National Fire Alarm and Signaling Code
Publication Date: 2025 (LANL uses 2019 per ESM Ch. 2, Att. 1)
Type of Change: Complete Revision

NFPA 72 ERTA 1, National Fire Alarm and Signaling Code
Publication Date: 8/29/2024
Type of Change: Errata/Erratum to 2025 Edition (for info only since this edition is not yet LANL-adopted. When it is, ESM Ch. 1 Z10 says all errata shall be followed)

NFPA 80, Standard for Fire Doors and Other Opening Protectives
Publication Date: 2025 (LANL uses 2019 per ESM Ch. 2, Att. 1)
Type of Change: Complete Revision

UL 508, UL Standard for Safety Industrial Control Equipment
Publication Date: 10/28/2024 (LANL uses per ESM Ch. 7, D5020; the latest per Z10)
Type of Change: Complete Revision

DOE TECHNICAL STANDARDS ACTION
Tech Stds Program postings are listed on the Technical Standards Portal.

DOE-STD-1174-2024, Radiation Protection Functional Area Qualification Standard (used only by Feds)

DOE-STD-8004, Low-Level Waste Disposal Facility Federal Review Group (LFRG) Functional Area Qualification Standard (used only by Feds)

MSS DOCUMENT ACTION
Operation and Maintenance Criterion and related Preventative Maintenance Instructions (PMI) are standards with which system and plant engineers should be familiar. Implementation is required 30 days from issue date for non-nuclear facilities, 60 days for nuclear facilities. Questions? Contact the document author shown on its approval page.

Below are recent changes issued by Maintenance and Site Services Division per Jeremy Vonharders. Click here to access. If you have issues with SharePoint sites, use a Microsoft browser (e.g., Edge) to access them.

AP-MSS-003 Rev 3: Records Management

- Moved to current AP template.
- Major rewrite of this MSS records management AP to comply with LANL P1020-1, *Laboratory Records Management*, and P1020-2, *Laboratory Document Control*; included RIDS.
- Updated organization names and roles/titles throughout.
- Updated numbers and titles of references throughout.
- Updated Section 9.1, *Acronyms*.
- Updated information in Section 12.0, *Contact*.

O&M 302 Rev 4: Utility Tie-Ins

- Moved to current O&M template.
- Updated organization names throughout.
- Updated Section 3.0, *Acronyms and Definitions*.
- Incorporated basis statements throughout Sections 6.0, *Requirements*, and 7.0, *Recommendations*.
- Added clarification to Section 6.1, *Engineering Requirements*, for utility tie-in requests stating ESRs must capture technical baseline modifications. Indicated in Section 6.2.7, *Inspection and Final Acceptance*, that technical baseline changes shall follow UIDO-PROC-60-00-015.
- Removed *Required Documentation* section.
- Updated Section 9.0, *References*.

O&M 303 Rev 3: Utility Disconnects

- Moved to current O&M template.
- Updated Section 3.0, *Acronyms and Definitions*.
- Incorporated basis statements throughout Sections 6.0, *Requirements*, and 7.0, *Recommendations*.
- Added clarification to Section 6.2.5, *Disinfection*, that inactive portions of piping systems do not require disinfection.
- Indicated in Section 6.2.7, *Inspection and Final Acceptance*, that technical baseline changes shall follow UIDO-PROC-60-00-015.
- Removed *Required Documentation* section.
- Updated Section 9.0, *References*.
- Updated organization names throughout.

O&M 734 Rev 5: Fire Dampers, Smoke Dampers, and/or Combination Fire/Smoke Dampers

- Migrated to current template.
- Updated code references to conform to updated NFPA requirements.
- NFPA 72 (2022 edition)
- NFPA 80 (2022 edition)
- NFPA 90A (2024 edition)
- NFPA 105 (2022 edition)
- Added "Fire Dampers" heading to Section 6.2.2. Operational Testing.
- Added Section 8.0 Implementation Guidance.
- Removed Section 9.0 Required Documentation.
- Added standard requirements step to Attachment 3.
- Moved personnel requirements to Section 6.0 Requirements.

O&M 738 Rev 2: Fire and Smoke Barriers

- Moved to current O&M template.
- Updated Section 2.0, *Scope*, to include ITM of smoke barriers.
- Updated Section 3.0, *Acronyms and Definitions*.
- Deleted *Required Documentation* section.
- Updated Section 9.0, *References*.
- Updated references to codes (and associated section references) throughout O&M to current editions, including IBC 2021, IFC 2021, NFPA 1-2024, NFPA 101-2024, and NFPA 221-2024.

PMI 405-A: Water Heather Monthly Inspection and Maintenance Replaces them

- These two PMIs should be joined with 405-A: Water Heater Monthly Inspection and Maintenance as checklists instead of as separate PMIs.

PMI 405-B & 405-C: Cancelled.

PMI 420-A Rev 1: Steam Trap Testing and Maintenance

- Reapplied placekeepers/checkboxes (S U N/A) throughout so that these checkboxes only appear with steps that have an acceptance criteria.
- 420-A.001:
  - Separated multi-step items into individual steps.
  - Converted action steps into note for temperature adjustments for process inlet/heating apparatus and steam trap inlet temperatures.
  - Converted action step into note regarding trap location.
  - Converted action step into note regarding length of discharge line.
- 420-A.003:
  - Clarified step regarding using a wrench to remove the valve seat.
  - Removed language regarding steam trap shop.
- 420-A.004, 420-A.005, and 420-A.006:
  - Separated multi-step items into individual steps.
- 420-A.007:
  - Removed contradictory note about use/non-use of a wrench.
  - Separated multi-step items into individual steps.

PMI 431-A Rev 4: Automatic External Defibrillator (AED) Maintenance

- Added clarification to caution notes regarding repeatedly turning the SAM 450P off and on.
- Added steps 2.4.1 through 2.4.4 to 431-A.002

PMI 507-A Rev 5: Lightning Protection System Inspection and Testing

507-A.001 and 507-A.002

- Modified step 2.2.1 from “Conductors are installed in accordance with the drawing(s) or NFPA 780…” to “Conductors are
- installed in accordance with NFPA 780…”
- Removed step 2.2.3 from Down Conductors
- Removed 2.3, Roof Configuration and sub steps
- Modified step 2.3.1 from “Air terminals are installed in accordance with the drawing(s) or NFPA 780…” to “Air terminals are installed in accordance with NFPA 780…”
- Modified step 2.4.1 from “LP conductors are installed in accordance with the drawing(s) or NFPA 780…” to “LP conductors are installed in accordance with NFPA 780…”
- Removed 2.6, Bonding Conductors, heading
- Removed additional steps within 2.7, Surge Protective Devices
- Removed “MSS-CE” from lead inspector/designee approval lines in Section 3.0, LPS Inspection Results: System Certification
- Removed “Acknowledgement of Results” from Section 3.0, LPS Inspection Results: System Certification

507-A.002:

- Modified step 3.1 to remove note about explosive facilities.
- Modified step 3.3 from “Non-Visible Down” to “Visually Corroded or Damaged”

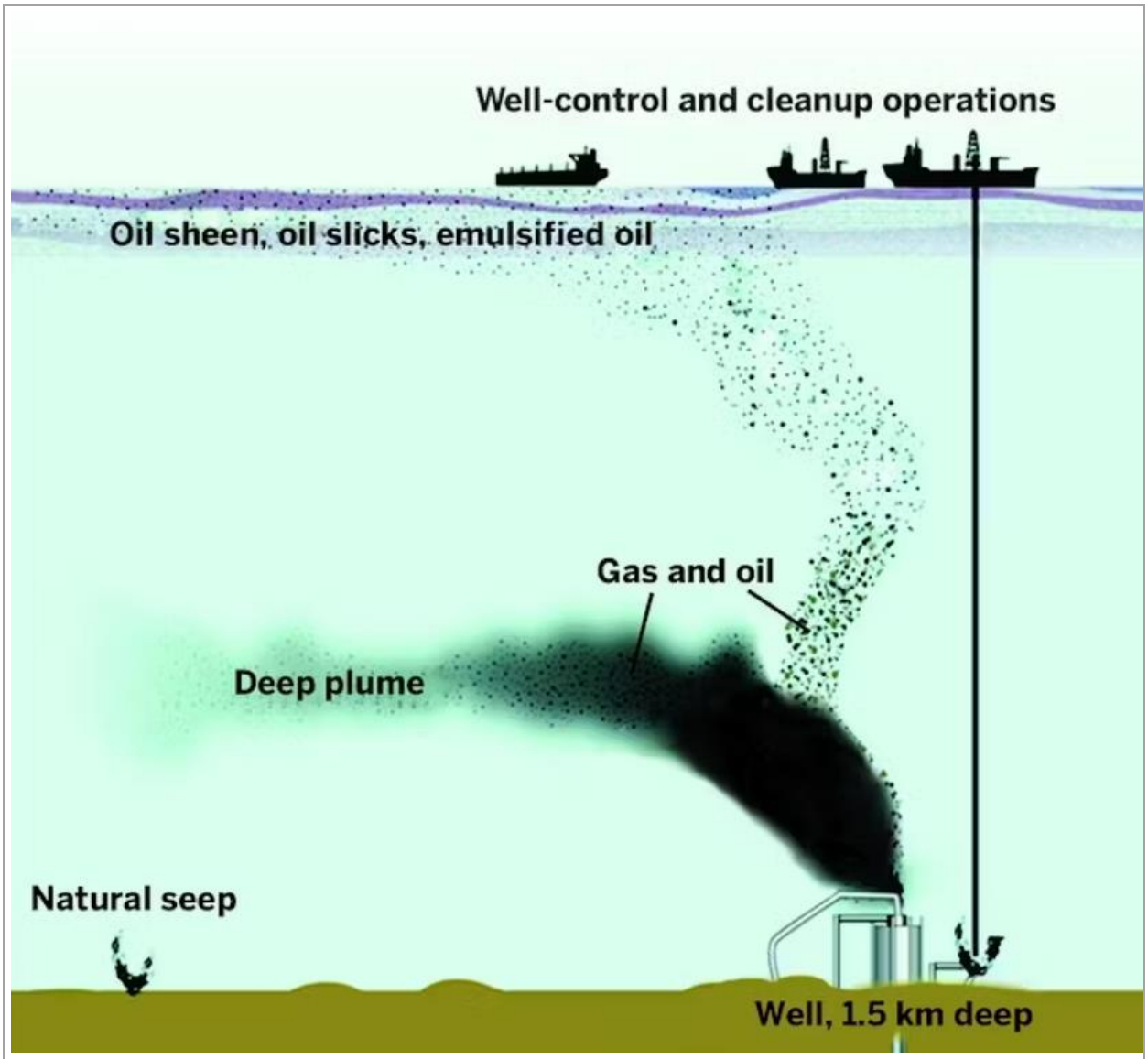
Added Checklist 507-A.003, *Lightning Protection System Inspection and Testing Due to Change or Visual Damage*

PMI 732-A Rev 2: Fire Door Inspection, Testing, and Maintenance

- Added steps to 732-A.001 to ensure that fire doors are returned to their normal operating position.

WHEN GOOD CONDUCT OF ENGINEERING ISN’T FOLLOWED

A brief look back in the not-so-distant past: Deepwater Horizon oil spill - Legal Action, BP, Gulf | Britannica



With assistance from ChatGPT

The **Deepwater Horizon spill**, also known as the BP oil spill, occurred on April 20, 2010, in the Gulf of Mexico. It is considered one of the largest environmental disasters in U.S. history. The accident occurred on the Deepwater Horizon, a drilling rig operated by Transocean and leased by BP, which was working on an exploratory well at the Macondo Prospect, located approximately 40 miles off the coast of Louisiana.

Summary of the Incident:

- **Explosion and Fire**: On April 20, 2010, a blowout occurred due to a failure in controlling the oil and gas pressure during the drilling process. This resulted in a massive explosion and fire on the rig. Eleven crew members were killed, and 17 others were injured.
- **Sinking of the Rig**: After burning for nearly two days, the rig sank on April 22, 2010, causing a ruptured wellhead to release oil into the Gulf.
- **Uncontrolled Oil Spill**: Oil continued to leak from the wellhead for 87 days before it was capped on July 15, 2010. By that time, an estimated 4.9 million barrels of oil had spilled into the Gulf.

- **Environmental and Economic Impact**: The spill severely impacted marine and wildlife habitats, fishing, and tourism industries along the Gulf Coast. It is believed to have caused significant damage to ecosystems and led to long-term environmental issues.

Causes of the Accident:

1. **Failure of the Blowout Preventer (BOP)**: A critical safety device called the blowout preventer, designed to seal the well in case of a blowout, failed to activate. This failure was later attributed to several factors, including design flaws and maintenance issues.
2. **Cementing Issues**: A process called cementing (performed by Halliburton) was meant to secure the well and prevent oil and gas from escaping. However, the cement job was flawed, allowing hydrocarbons to leak into the well, leading to the explosion.
3. **Human and Organizational Failures**: Investigations revealed a series of human errors and poor decision-making, including misinterpreting pressure test results. A negative pressure test, which should have been a warning sign, was ignored, contributing to the blowout.
4. **Lack of Safety Culture**: BP and its partners were criticized for prioritizing cost-cutting and operational efficiency over safety. A culture of complacency and inadequate risk management was identified within BP and its contractors.
5. **Miscommunication and Lack of Oversight**: There was poor communication between BP, Transocean, and Halliburton, with each party not fully understanding or addressing critical risks in the drilling process. Regulatory oversight was also considered weak at the time.

Lessons Learned:

1. **Stronger Safety Regulations**: The disaster prompted major reforms in the regulation of offshore drilling. The U.S. Department of the Interior restructured its oversight agencies and implemented stricter safety and environmental standards for drilling operations, including better testing and certification of blowout preventers.
2. **Improved Blowout Preventer (BOP) Designs**: The failure of the BOP led to significant design improvements and stricter testing procedures for these critical devices. New regulations also require that BOPs be more robust and reliable to prevent similar incidents.
3. **Risk Management and Safety Culture**: The incident underscored the importance of a strong safety culture in high-risk industries. Companies are now more focused on risk management, proper training, and the empowerment of workers to report safety concerns without fear of retaliation.
4. **Real-time Monitoring and Response Plans**: Enhanced monitoring and contingency plans were developed to ensure that companies can respond more effectively in the event of a blowout or spill. Drills and real-time simulations became more common to prepare for potential disasters.
5. **Environmental Protections**: The spill highlighted the need for better protections for sensitive marine environments. Stricter environmental reviews and assessments are now required before drilling operations can begin.
6. **Industry Collaboration**: The spill led to more collaboration within the oil industry to share safety practices and develop technologies to prevent future disasters. Industry groups have formed initiatives such as the Marine Well Containment Company to provide rapid response capabilities in case of another deepwater blowout.

Conclusion:

The Deepwater Horizon disaster was a tragic reminder of the risks associated with deepwater oil drilling. While it resulted in severe environmental damage, loss of life, and economic hardship, it also led to significant regulatory reforms, improved safety practices, and greater industry collaboration aimed at preventing future accidents.

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

- New BIM Standards Released!
- Update to Construction Submittal Code Definitions - Coming Early-Oct!
- Data Call for National Standards Committee Work
- Engineering Services Career Day
- Training & Qualification
- LANL Engineering Standards Issued in September
- LANL Engineering Processes Changes
- National Standards Action
- DOE Technical Standards Action
- MSS Document Action
- When Good Conduct of Engineering Isn't Followed

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