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Comparison of DOE and DoD Fire Protection: A first hand account

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U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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Outline of Presentation

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- My background
- Compare DOD and DOE fire protection requirements
- DOD Lesson Learned #1
- DOD Lesson Learned #2
- Compare my job duties at DoD and DOE
- Apply lessons learned to current position

My background

- BS and MS in Mechanical Engineering, University of New Mexico
- 5 years as fire protection ***(design)*** engineer with the US Army Corps of Engineers (USACE), Albuquerque District
- 8 months as fire protection ***(non-design)*** engineer with Sandia National Laboratories (SNL), NM Site
- Currently enrolled in Cal Poly Fire Protection Engineering MS program

Just one letter difference right?

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Topic to Compare:	DOE (SNL)	DoD (USACE)
Governing Criteria	Orders and Standards	United Facility Criteria (UFCs)
AHJs	Local site designation	Project Dependant (usually local Base Fire Department)
Non-standard Hazards	Open to AHJ discretion	Strict Requirements
“Worst” Hazard	Chemicals, Explosives, Experiments, etc…	Fuel fire in hangar
Customers	Internal DoE based on site	Air Force, other government agencies
# of FPEs (Dept. Wide)	Very High	Low
Motto	SNL: “Exceptional Service in the National Interest.”	USACE: “Essayons” (“Let us try”)

DoD Lesson Learned #1: "Don't Blow a Gasket"!

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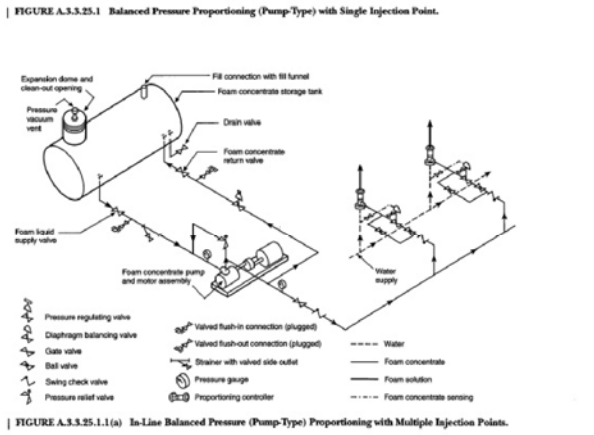
- High Expansion Foam (HEF) Suppression System in an aircraft hangar at an Air Force Base
- On 2 of the 3 HEF risers, gaskets ruptured and the fire pump kicked on. First time, damage was localized to the mechanical room; 2nd time was full foam discharge
- Contractor's side: Fire Pump kicked on for some unknown reason and over pressurized system leading to gasket failure (e.g. "Not their fault!") even though there was a 10 lb surge arrester/tank upstream of the gasket!
- When asked how system could be over pressurized with surge tank installed, contractor replied ***" Hydraulics are funny things!"***



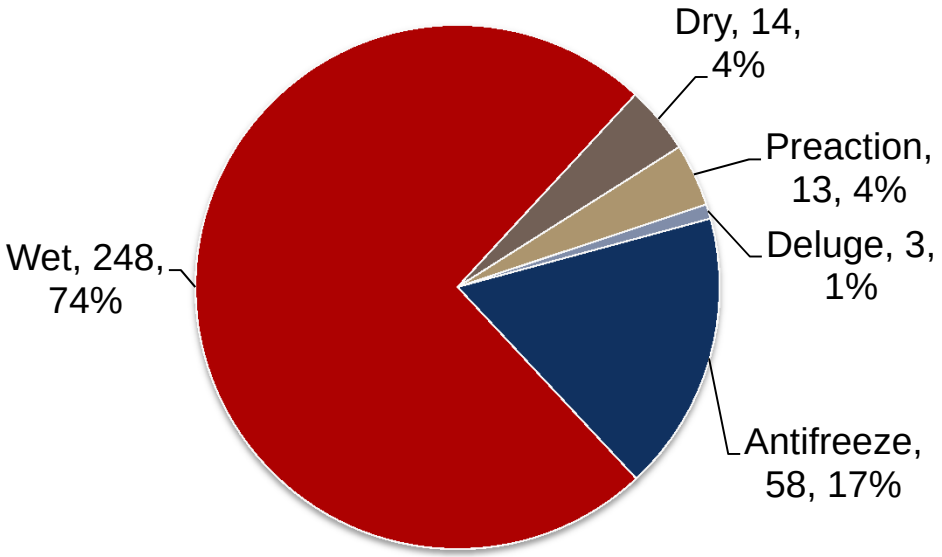
Food for thought: What's the proper way to arrange the foam pressurized line from the bladder tank?

DoD Lesson Learned #2: "Don't stand for un-needed pipes!"

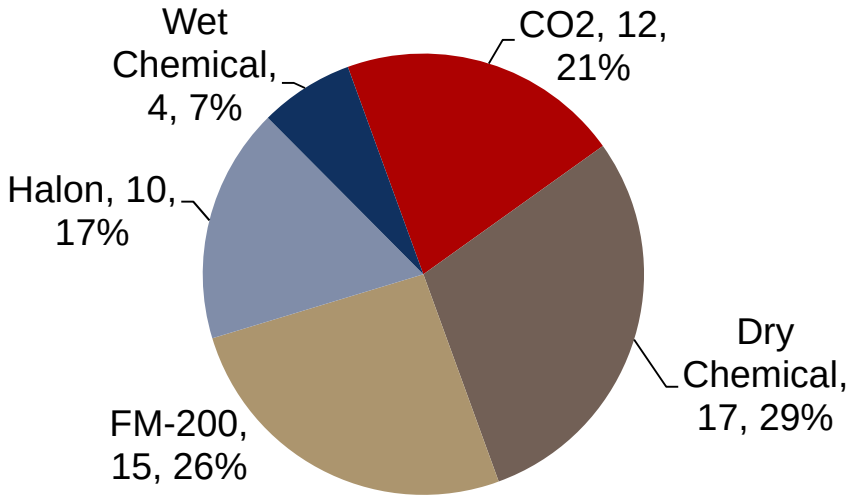
- AHJ at Air Force Base consistently requested (dictated) standpipes for buildings during A/E reviews for buildings undergoing low to moderate level modifications. (Example: Two story building with 200' maximum travel distance allowed.)
- No mention of standpipe during "Request for Proposal" development except one case where it was required
- DOD criteria is clear: Per UFC 03-600-01 paragraph 4-5.1:
  - Class I standpipes required when building is 4 stories or more in height
  - Class I standpipes required when hose lines would exceed 450 feet.
- Same AHJ has service contract with SNL: No "special standpipes" required!

Fire Protection from different views

- Previous FP role: Design fire suppression and alarm systems
- Current FP role: Fire Protection ITM lead
  - Includes standard sprinkler systems shown below (ITM: in-house staff)
  - Includes specialty systems such as FM-200 and CO2 (ITM: contractors)



Standard Sprinkler Systems Breakout



Specialty Suppression Systems Breakout

Based on 2012 data

Lessons learned applied to DOE job

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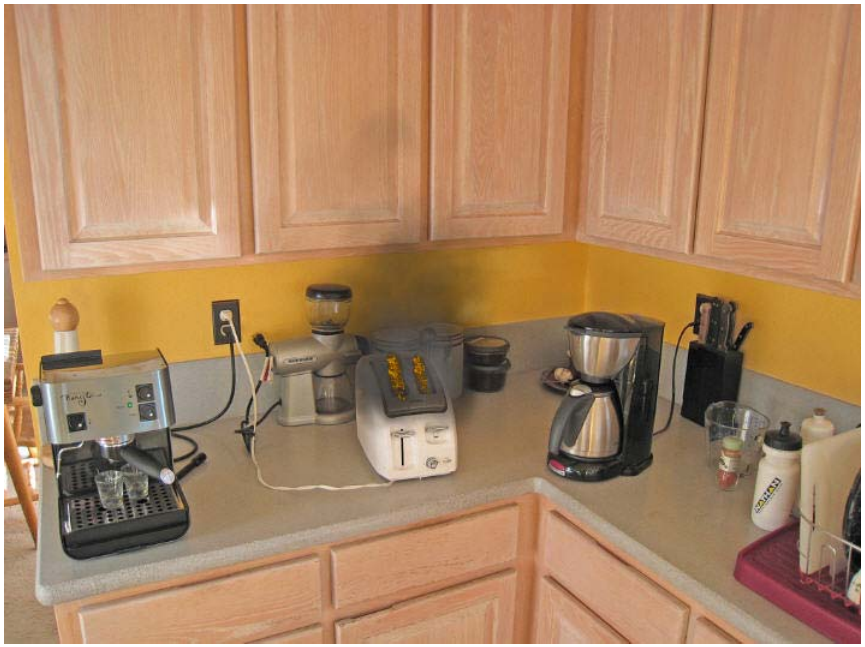
- AHJ does not equal total authority!
- Follow the Physics!
- Communication is key!
- False Alarms happen!
- It's a big place!



Thank you. Any questions?

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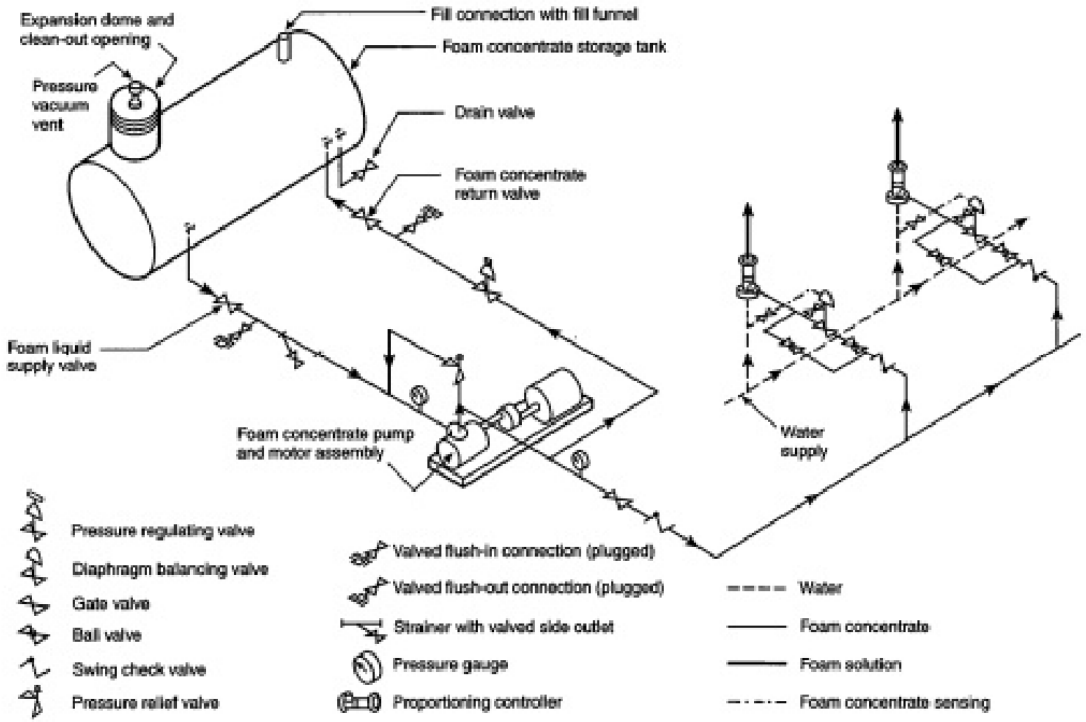
| FIGURE A.3.3.25.1 Balanced Pressure Proportioning (Pump-Type) with Single Injection Point.



| FIGURE A.3.3.25.1.1(a) In-Line Balanced Pressure (Pump-Type) Proportioning with Multiple Injection Points.

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