



# FIRE PROTECTION PROGRAM Performance Metrics



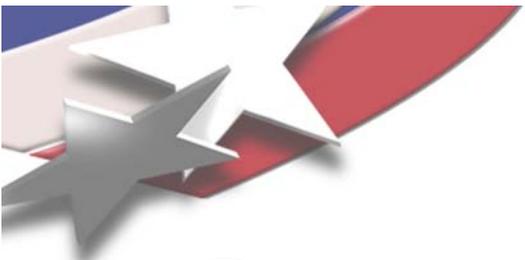
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Sandia National Laboratories

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# Key Questions

- What metrics will help monitor the health of the program?
- Does this metric provide a leading or lagging indication of a problem?
- What is the threshold for action?
- Will this threshold provide enough lead time to allow a response to prevent or mitigate undesired consequences?



# SCOPE

- Data presented applicable only to SNL-NM site – will include CA site in future
- Identify Directives and Work Controls for each fire protection program element to help define pertinent metric (will not cover due to time constraints)
- Iterative approach – work in progress



# A METRIC ON METRICS

## What is success?

- Identify areas for improvement and where resources can be most effectively used
  - Example - move from Prescriptive-Based Maintenance to Performance-Based Maintenance
- Identify trends where more resources need to be allocated to resolving issues – risk based
- Build trust and confidence in SNL management's and regulator's eyes – strengthen relationship



# METRIC CATEGORIES

- Fire Protection Requirements
- [SNL-NM Building Profiles](#)
- Program Self Assessments
- [Fire Protection Assessments](#)
- Fire Protection Systems
  - [Fire Alarm Systems](#)
  - Sprinkler Systems
  - Suppression Systems
  - Passive Protection Systems
- Staffing
- [Fire Loss](#)
- Operations
  - [Inspection, Test, & Maintenance](#)
  - Hot Work
  - Impairments
  - Permitting
  - Inspections
  - Emergency Services
- [Lessons Learned](#)
- [Initiatives](#)

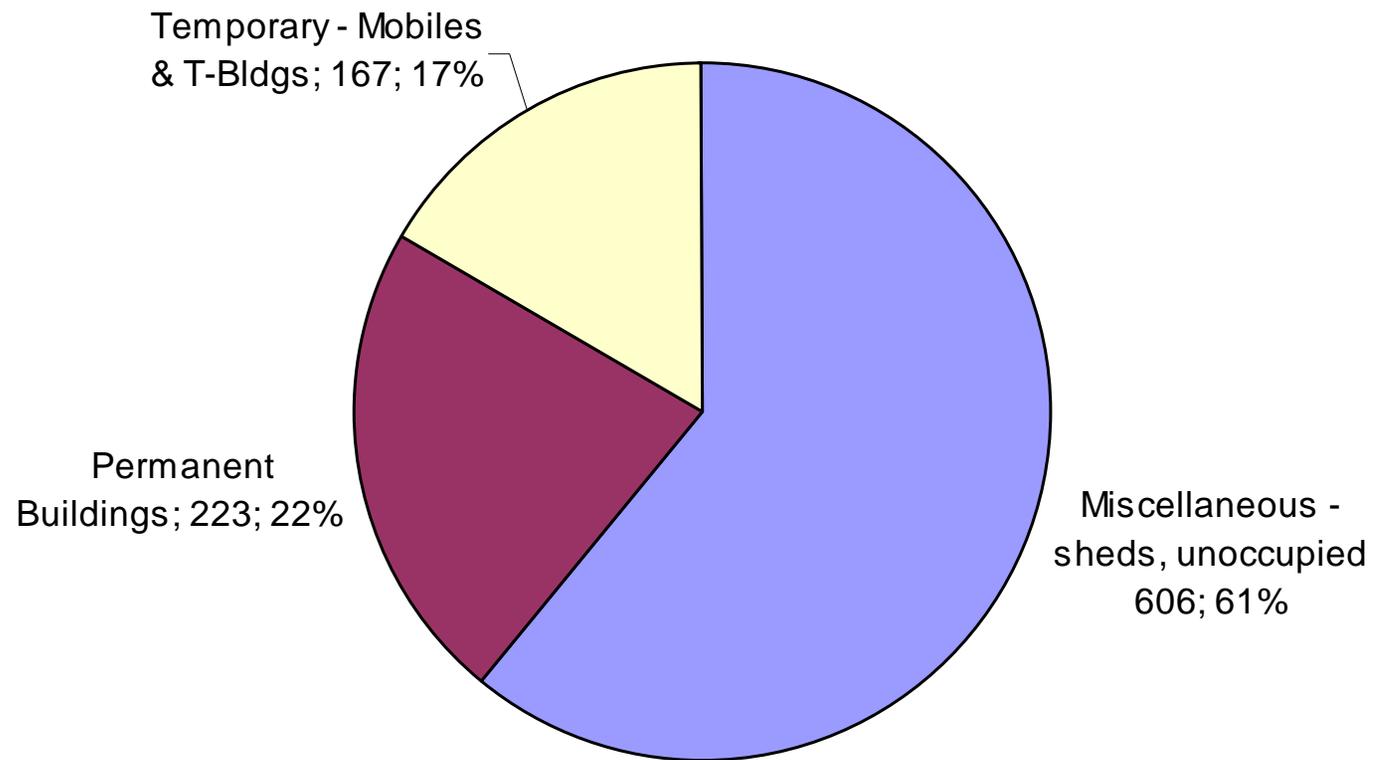


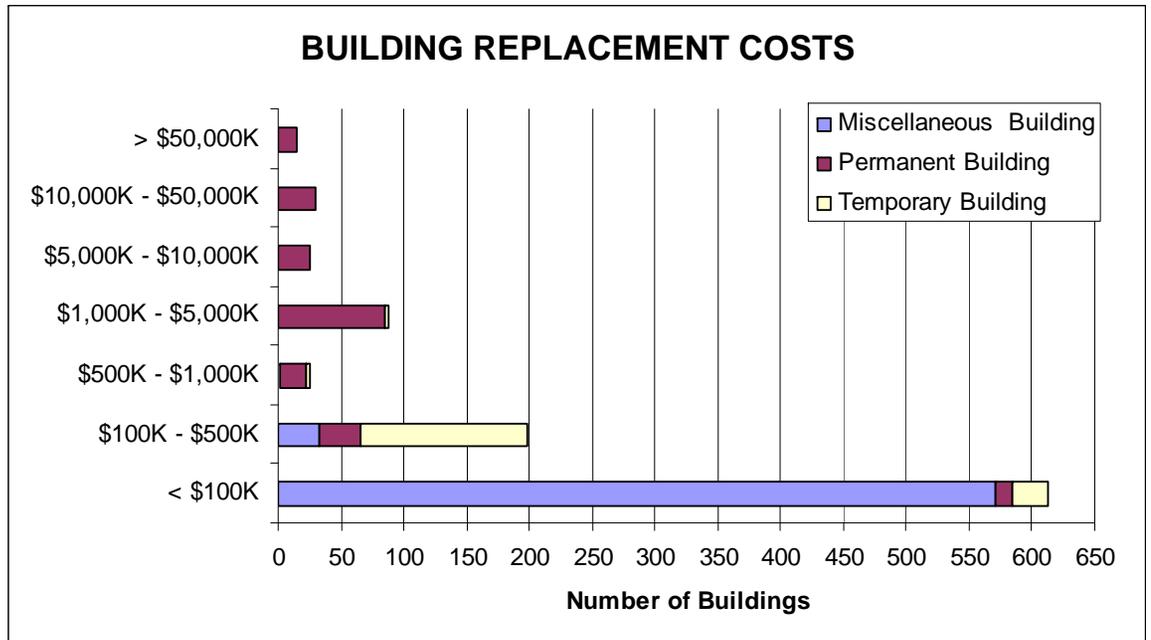
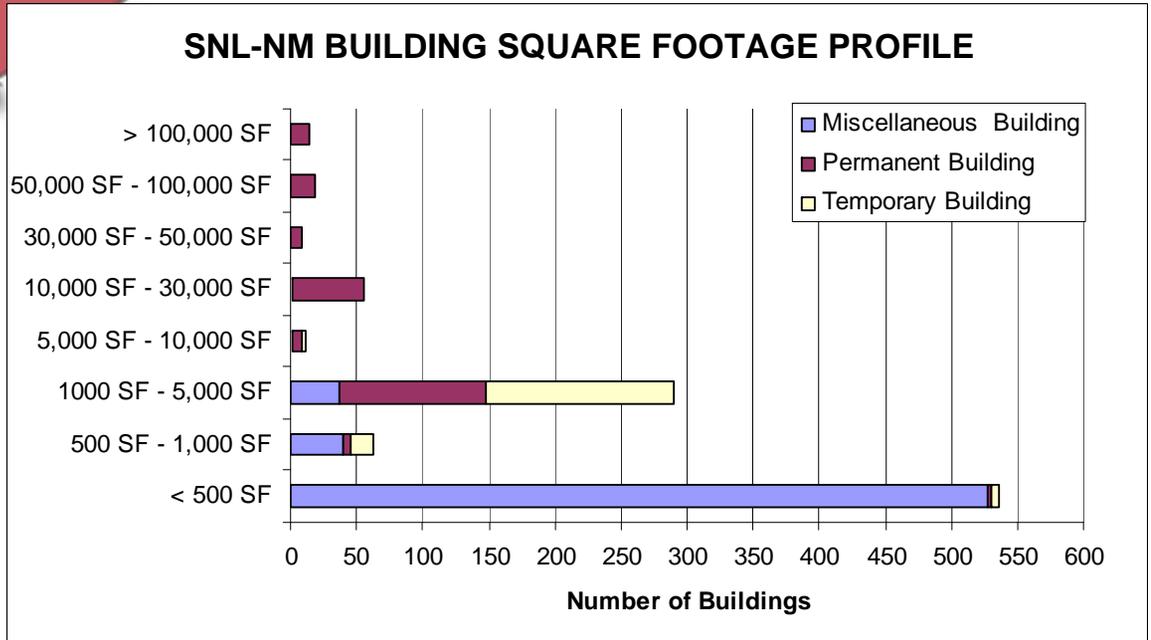
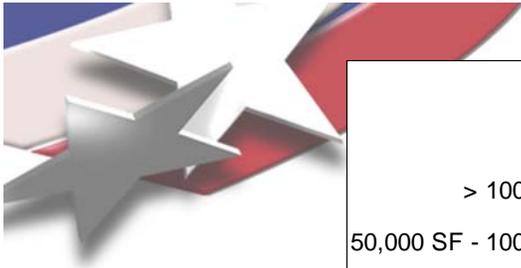
# SNL-NM BUILDING PROFILES

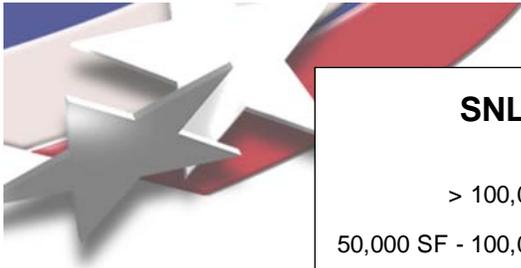


# BUILDING PROFILES

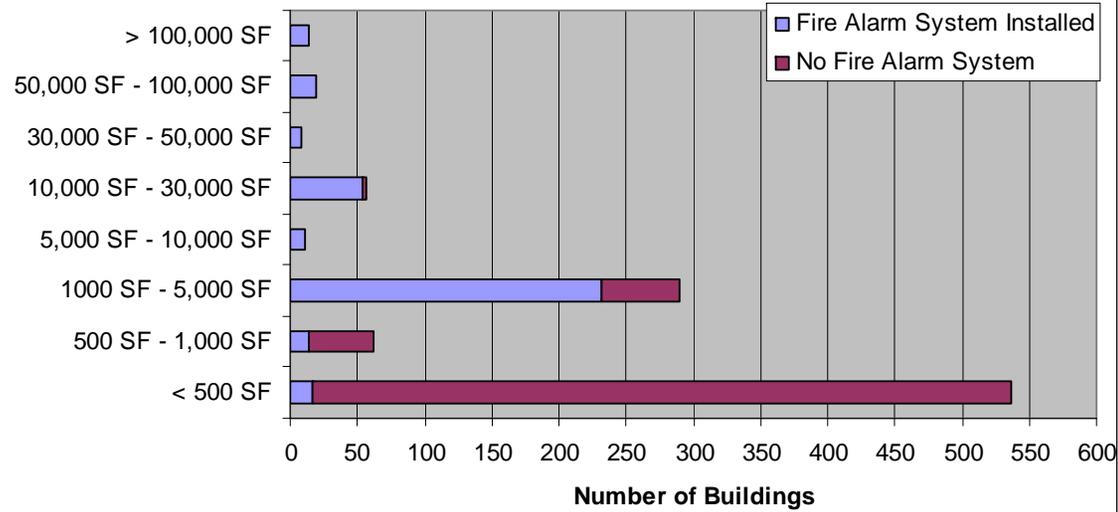
## SNL-NM BUILDING QUANTITIES (1996)







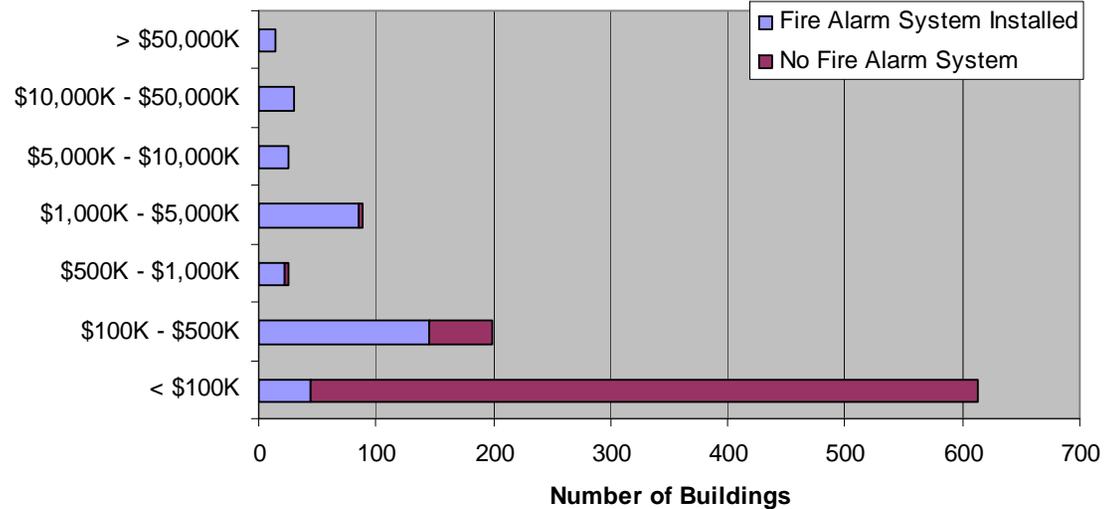
### SNL-NM BUILDINGS FIRE ALARM SYSTEM PROFILE



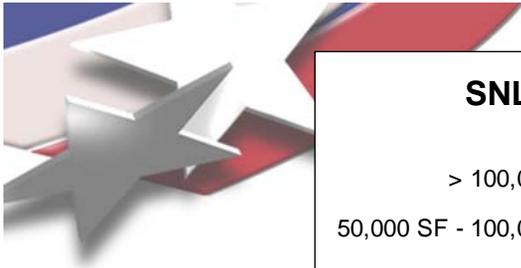
## Fire Alarms

By Bldg Size

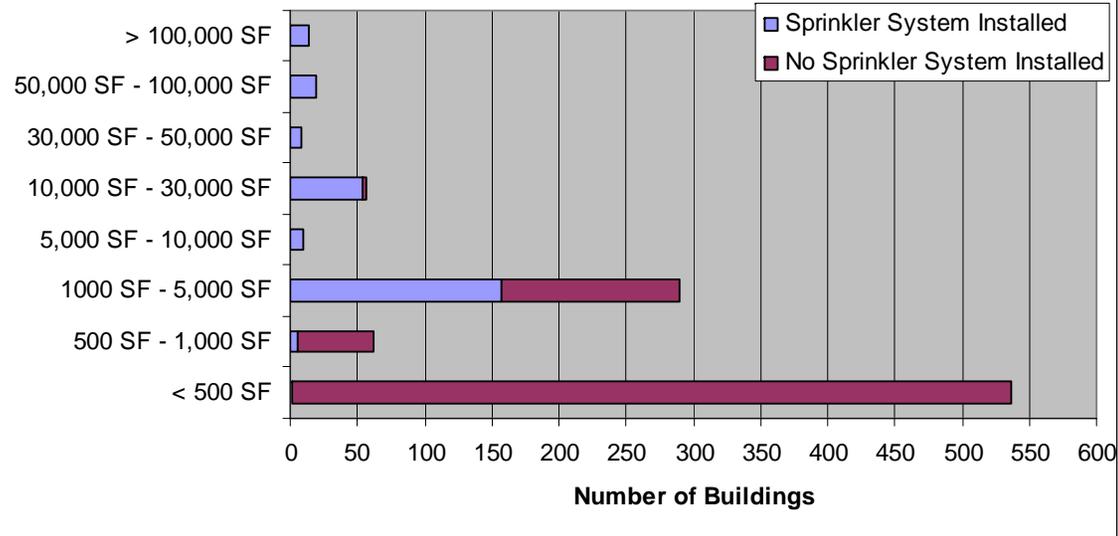
### SNL-NM BUILDINGS FIRE ALARM SYSTEM PROFILE



By Bldg Cost



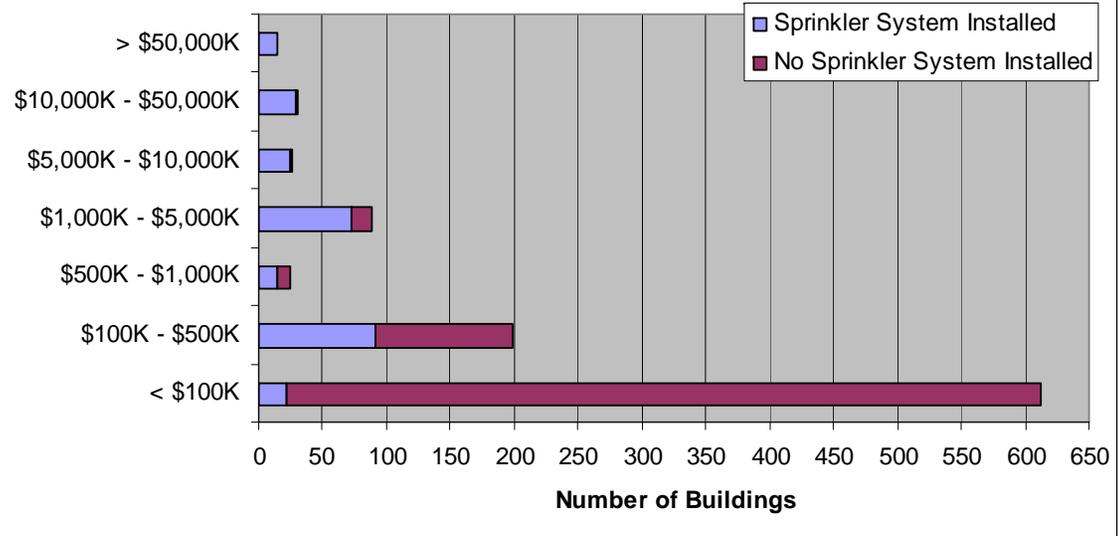
### SNL-NM BUILDINGS SPRINKLER SYSTEM PROFILE



## Sprinklers

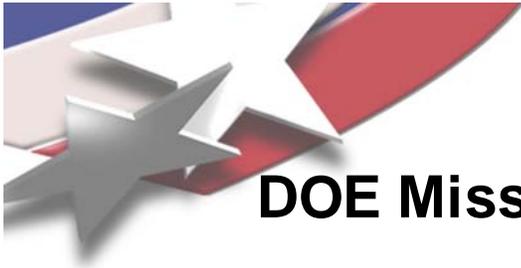
By Bldg Size

### SNL-NM BUILDINGS SPRINKLER SYSTEM PROFILE

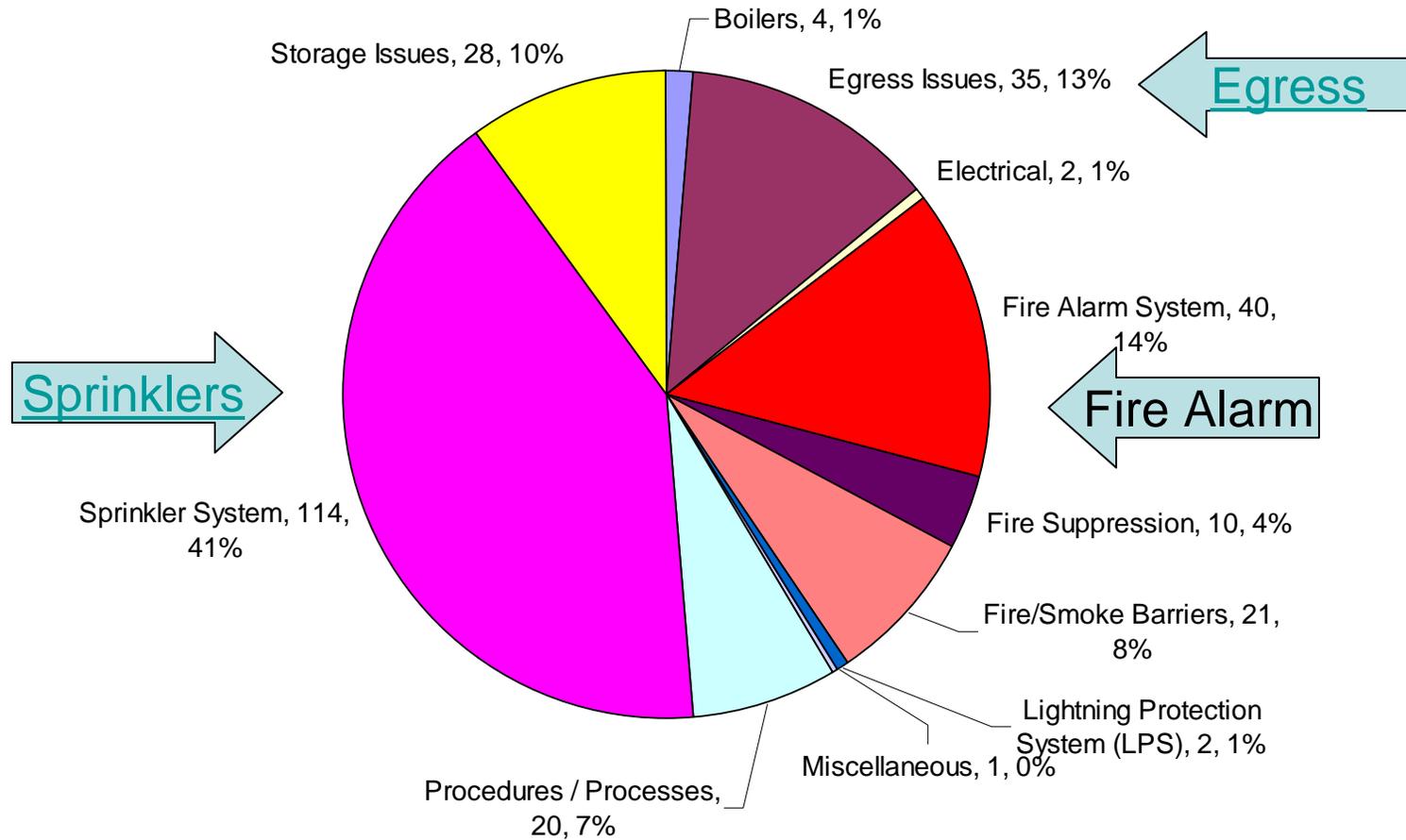


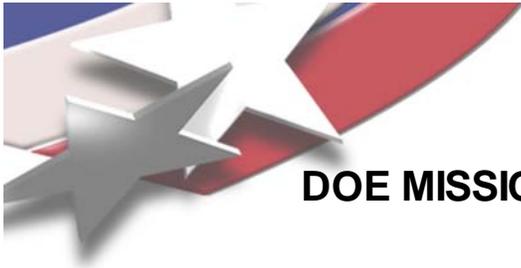
By Bldg Cost

TOC

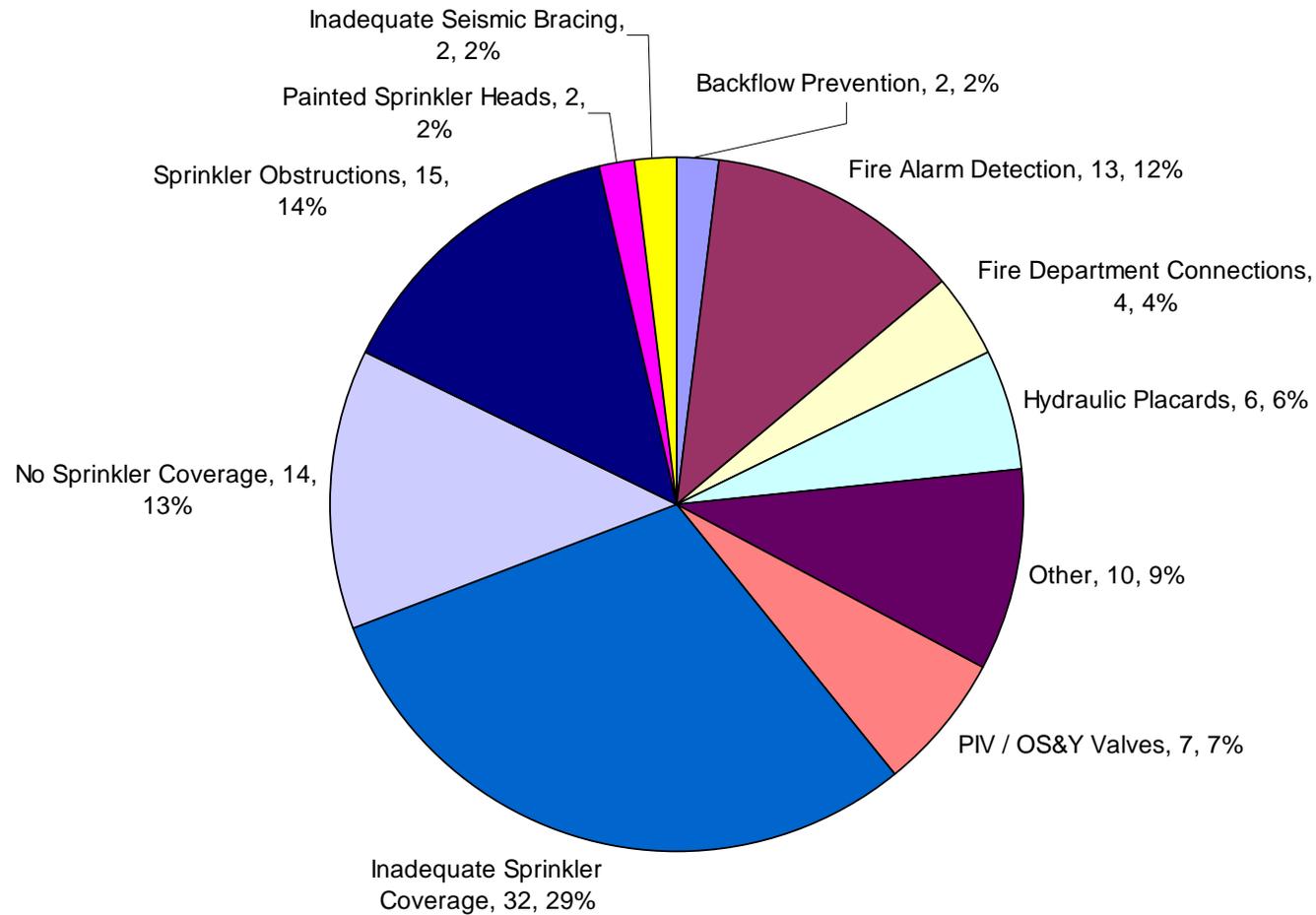


# DOE Mission Critical Building Finding Categories

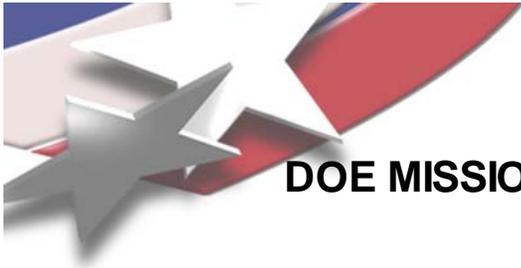




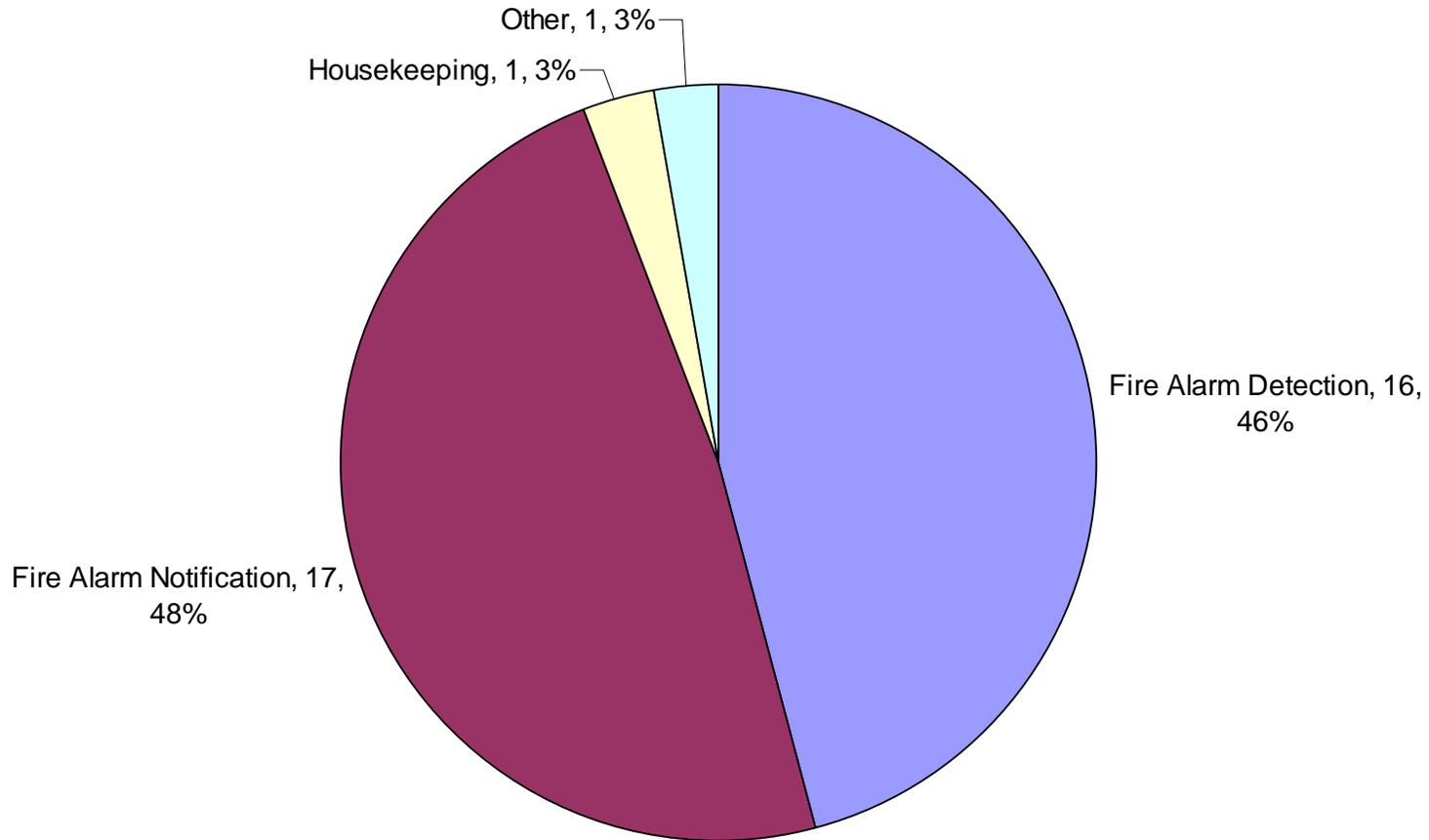
## DOE MISSION CRITICAL BLDGS. - SPRINKLER SYSTEM FINDINGS



Assess to current codes and refer to code of record to determine corrective action



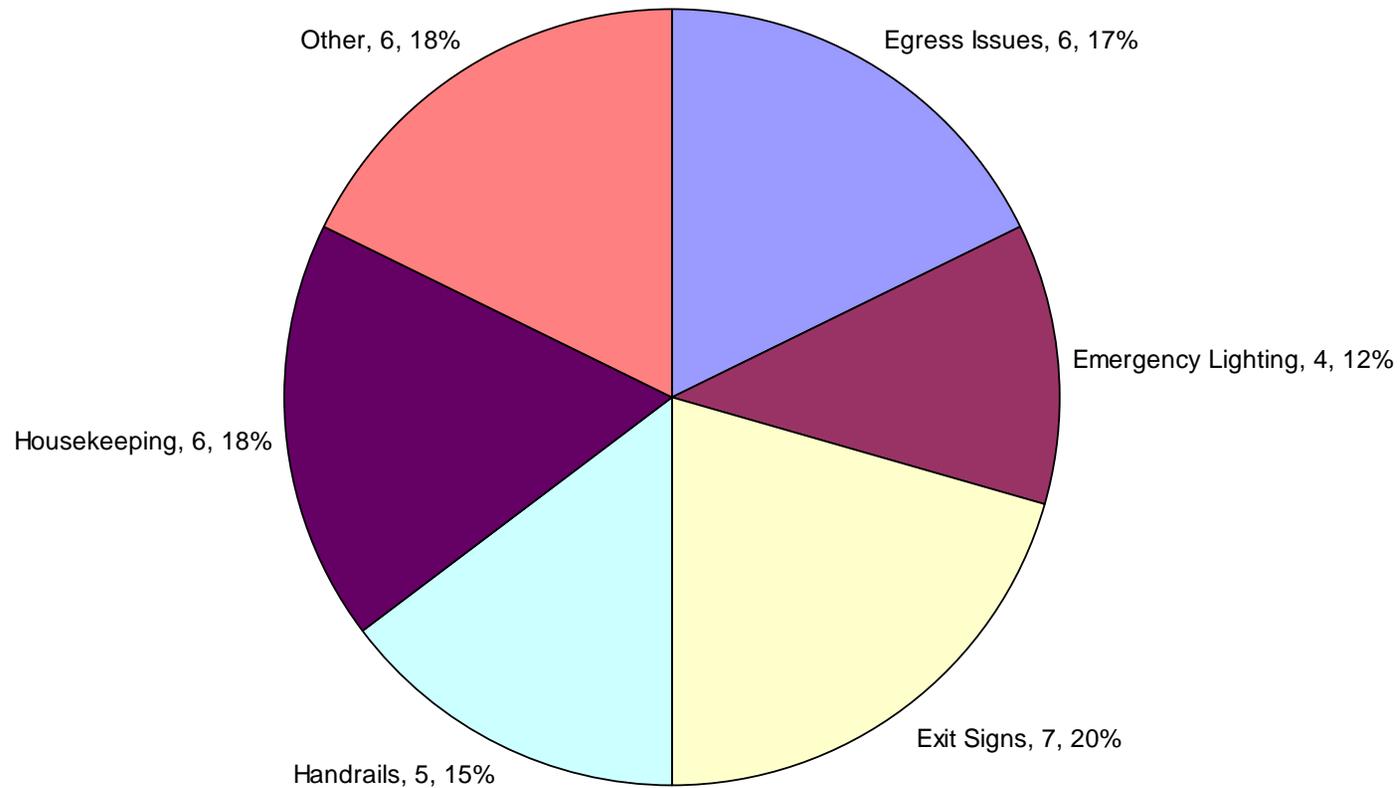
## DOE MISSION CRITICAL BLDGS. - FIRE ALARM SYSTEM FINDINGS



Assess to current codes and refer to code of record to determine corrective action



## DOE MISSION CRITICAL BUILDINGS - EGRESS FINDINGS



Assess to current codes and refer to code of record to determine corrective action

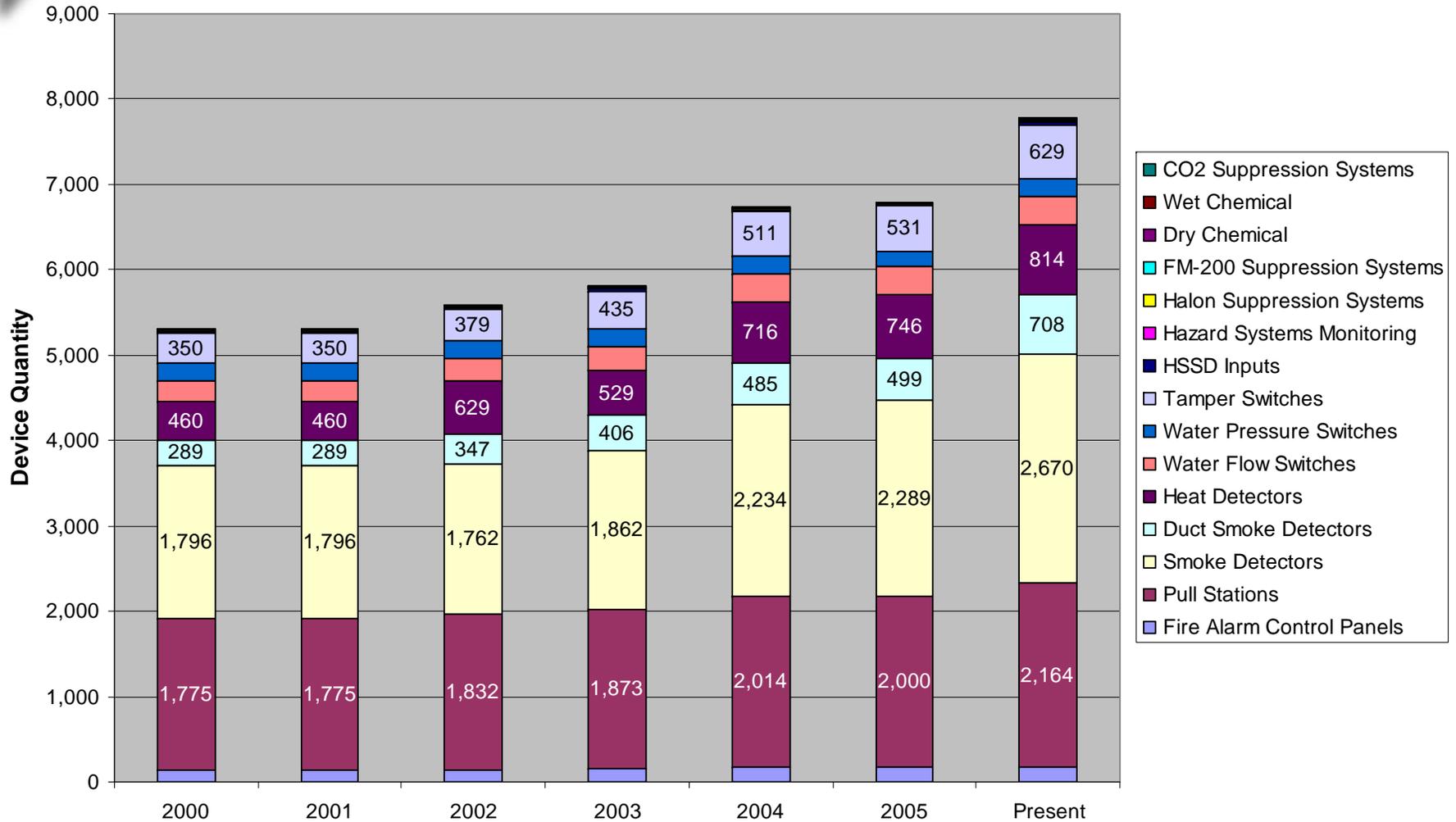
TOC



# FIRE ALARM SYSTEM



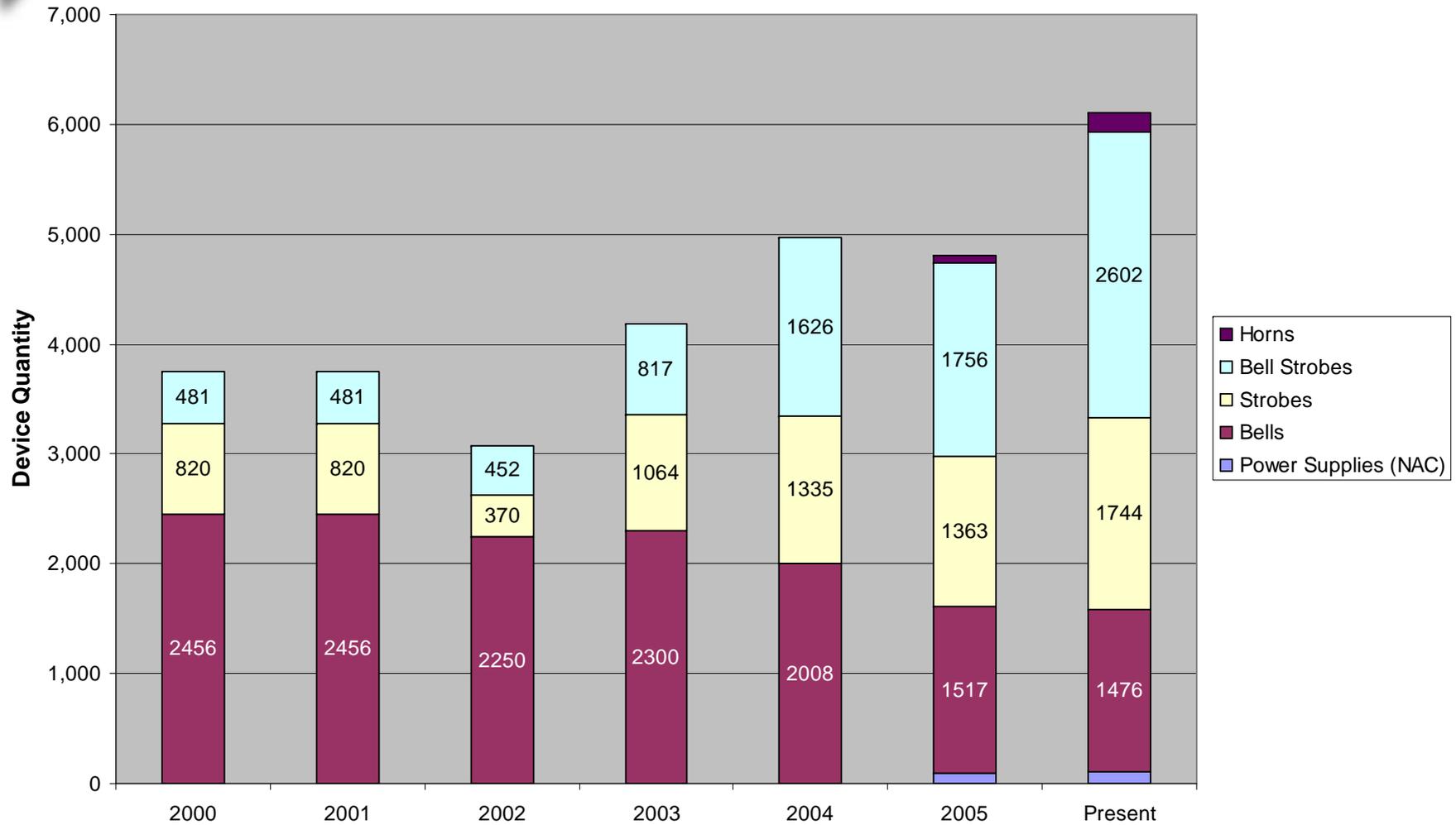
# FIRE ALARM INPUTS



Increased maintenance & training needs

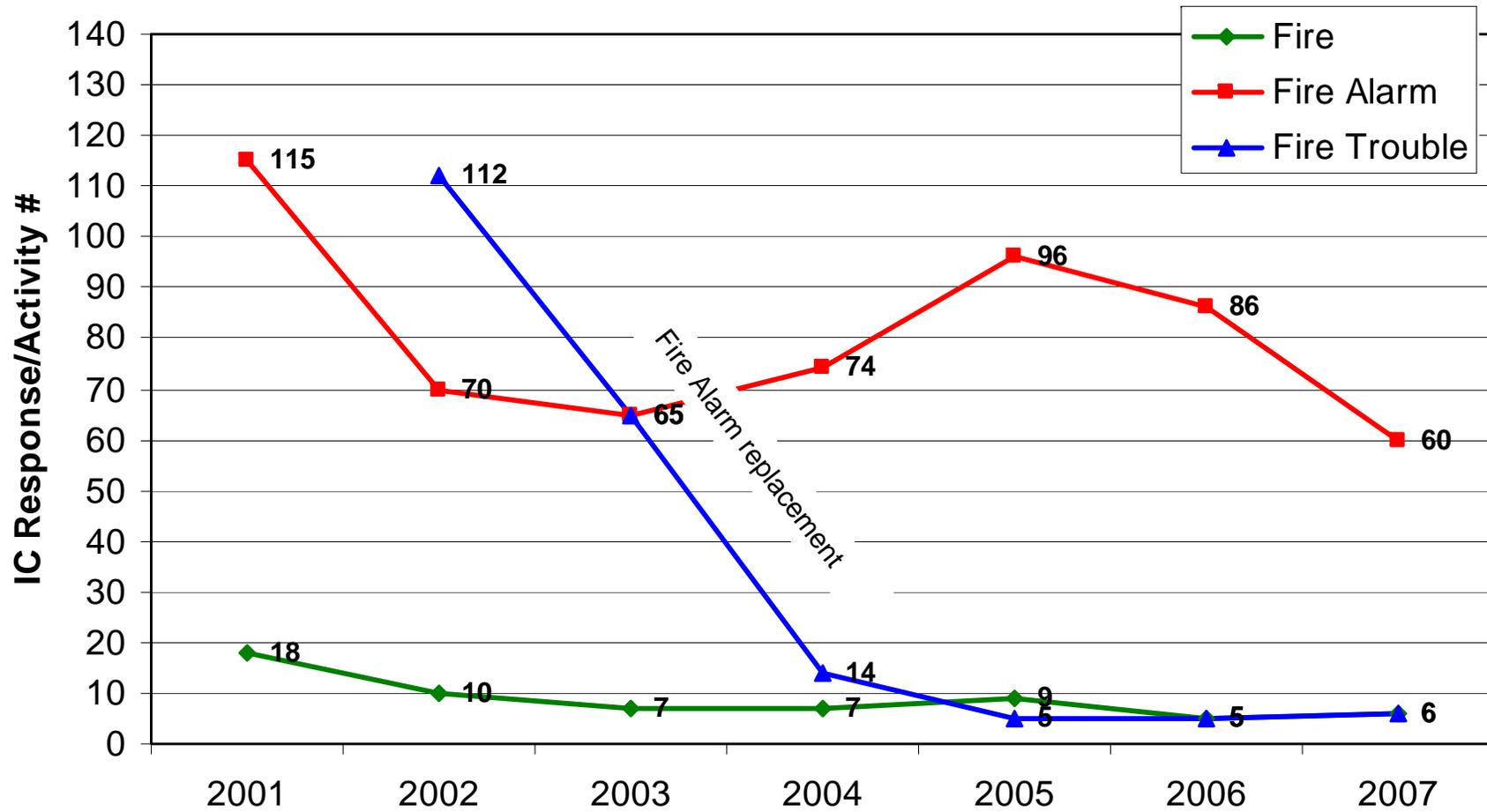


## FIRE ALARM NOTIFICATION APPLIANCES



Totals will increase as we upgrade fire alarm system

# INCIDENT COMMANDER RESPONSES / ACTIVITIES





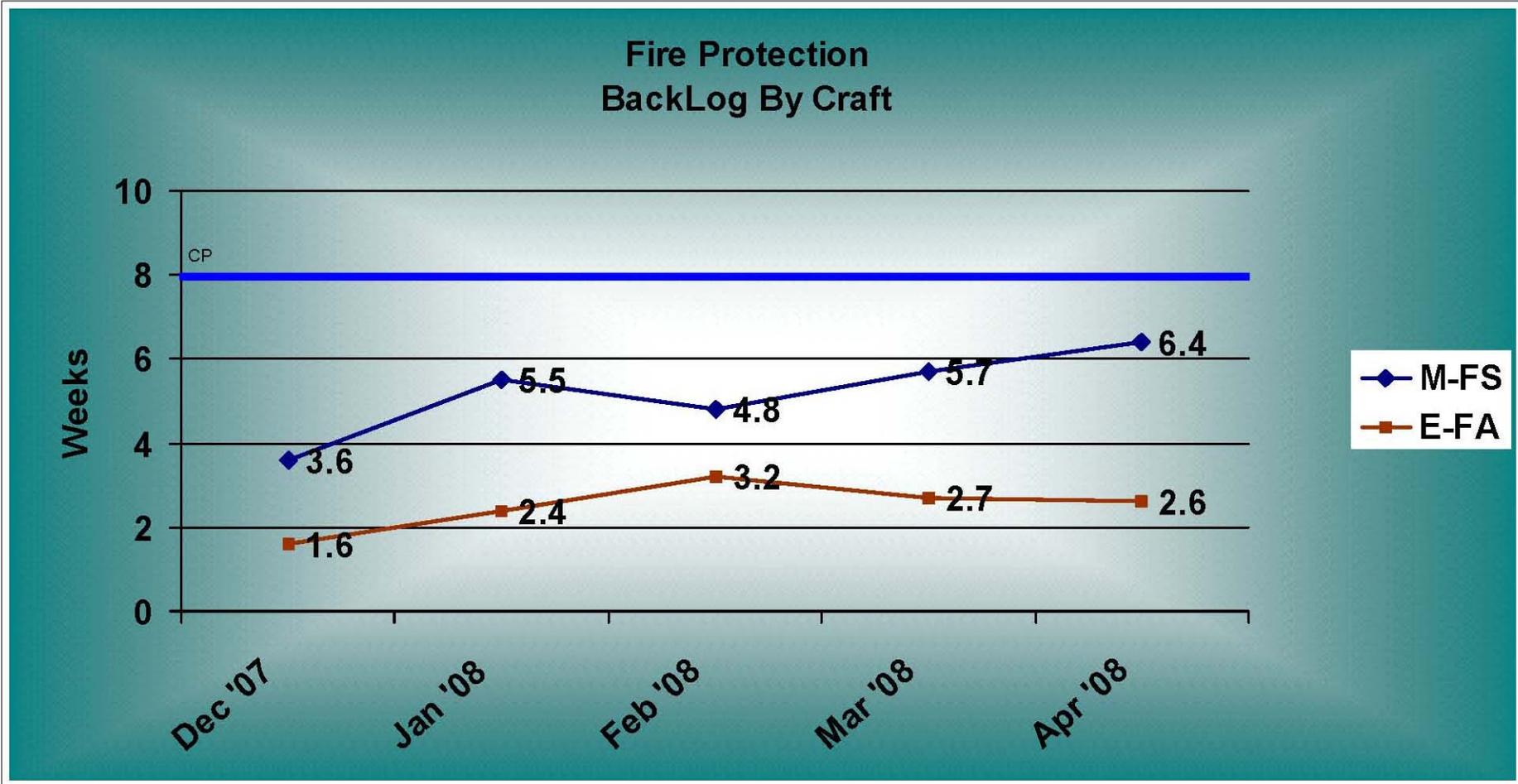
# ITM Metrics

- ITM Maintenance Backlog
- ITM Monthly Completion %
  - All NM Facilities
  - Mission Critical Facilities

TOC

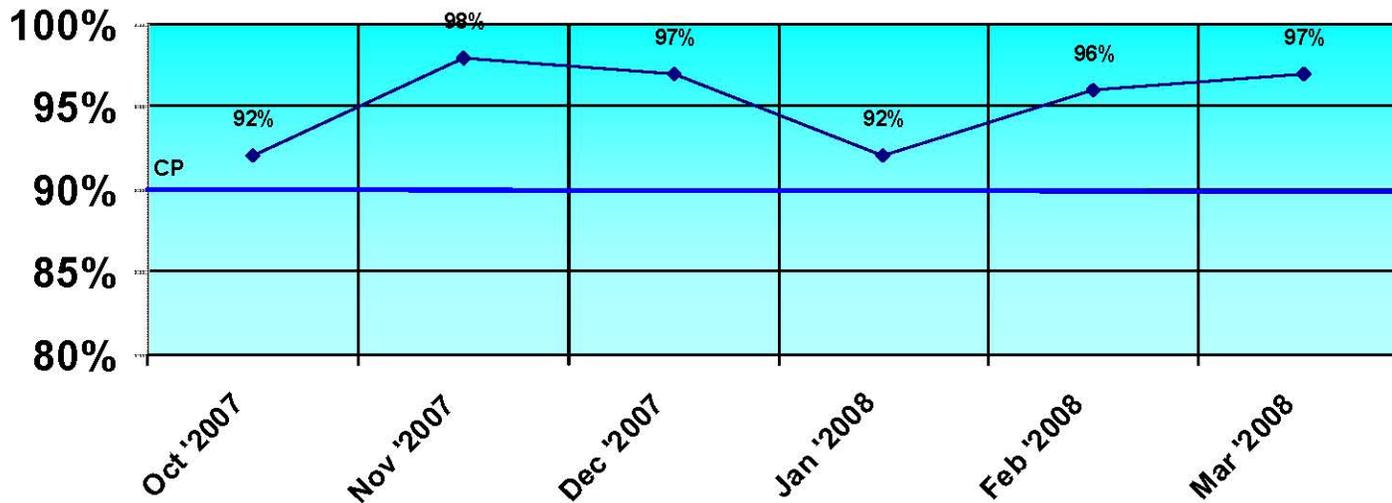
4/22/2008

The graph below represents weeks of backlog for fire protection trades electrical fire alarm (E-FA) and mechanical fire sprinkler (M-FS). The backlog is calculated by adding the total estimated hours of work by trade and dividing by the total available labor hours by trade per week. The available labor hours and the estimated work hours are dynamic, therefore we take one snapshot per week and calculate a monthly average.

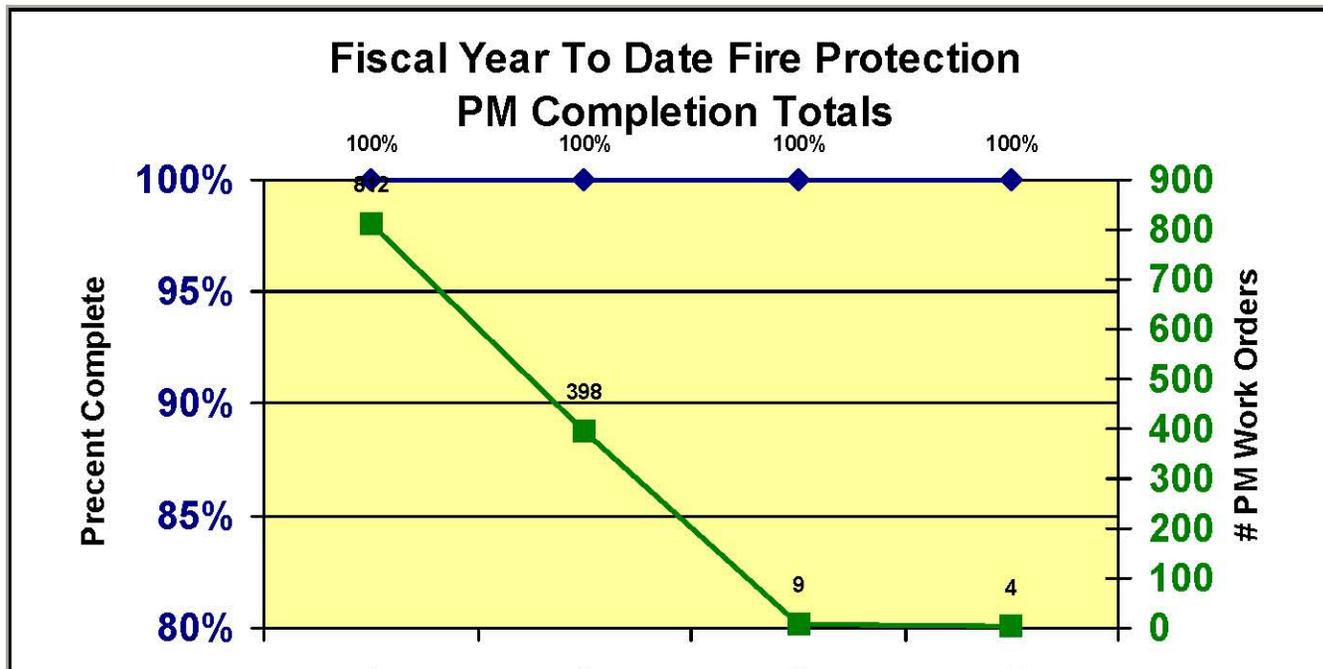




graph displays the percent of preventive and predictive work orders that were completed in the month scheduled. The date at the top is the date the graph was run. The completion % for the previous month may adjust upward as results are entered into Maximo.

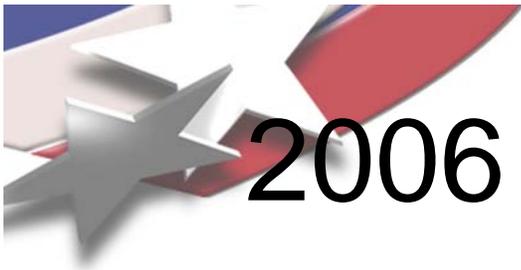


The chart below represents the percent of preventive and predictive work orders that are completed by priority since the beginning of the fiscal year. This includes the work orders completed after the month scheduled.



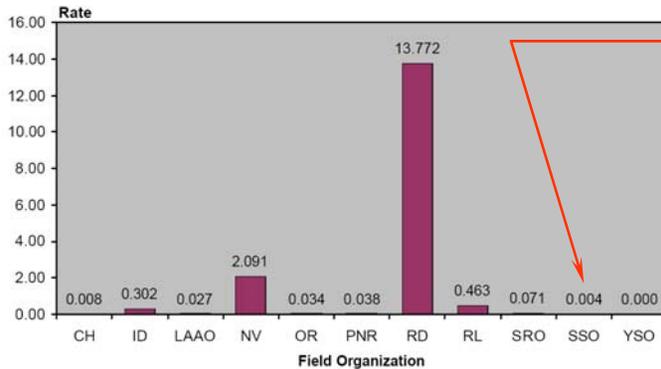


# FIRE LOSS



# 2006 Fire Loss Performance

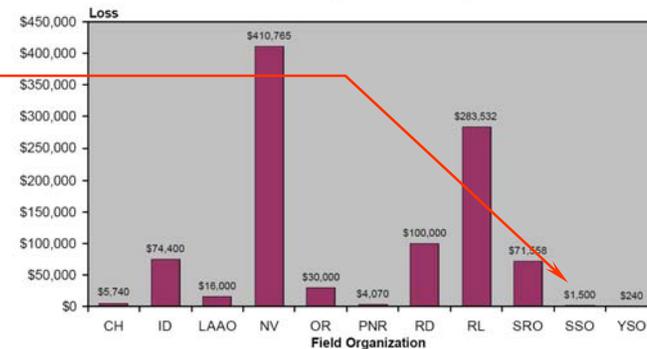
Fire Loss Rate by Field Organization



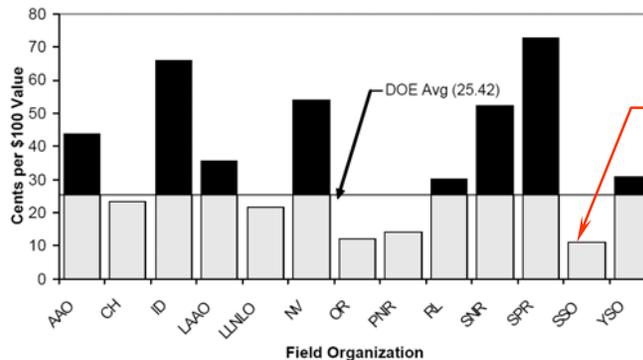
– Average fire loss rate (cents loss per \$100 of property value) for the DOE Complex in 2006 was 0.16, while Sandia’s rate was 0.004 (note—2006 data published in September 2007)

– Sandia’s 2006 loss amount was second lowest in the complex at only \$1,500

Fire Loss Amount by Field Organization



Cost Rate by Operations Office



– Sandia’s 2006 cost rate for fire protection activities was only 10 cents per \$100 of property value, the lowest rate of all sites and less than half of the DOE average of 25.42.



# 2007 Fire Loss

- \$40 fire loss – replenish portable fire extinguisher
- Several brush fires - No property or facility damage
- \$1760 Other loss – inadvertent activations
- 2007 Improvements
  - Fire loss improvement by a factor of 37.5
  - Other loss improvement by a factor of 103

TOC