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# 2012 Emergency Response Capability BNA Compliance Assessment

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January 3, 2013

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# Emergency Response Capability Baseline Needs Assessment Compliance Assessment



## Lawrence Livermore National Laboratory

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December 2012

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**Lawrence Livermore National Laboratory**

**2012**

Emergency Response Capability  
**BASELINE NEEDS ASSESSMENT**  
**Compliance Assessment**

Revision 7.0

December 2012

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## Table of Contents

1.0	Introduction and Executive Summary .....	5
1.1	Introduction .....	5
1.2	Executive Summary – Performance Assessment .....	5
1.2.1	Performance Status – Manual Firefighting LLNL Site 200.....	5
1.2.2	Performance Status Manual Firefighting – Site 300.....	6
1.2.3	Performance Status – Emergency Medical Service .....	6
1.2.4	Performance Status – Hazardous Materials .....	6
1.2.5	Performance Status – Technical Rescue .....	7
1.2.6	Performance Status – Second Incident .....	7
1.2.6.1	Observations – Second Incident.....	7
1.2.7	Performance Status -- Emergency Communications .....	8
1.2.7.1	Observations – Emergency Communications .....	8
1.2.8	Performance Status – Training and Certification.....	9
1.2.9	Performance Status – Pre-Fire Plans.....	9
1.2.10	Performance Status – Emergency Response Apparatus .....	10
2.0	Purpose.....	10
3.0	Scope.....	11
4.0	Assumptions.....	11
5.0	Emergency Response Organization .....	11
5.1	Alameda County Fire Department .....	11
5.1.1	ACFD Stations and Staffing .....	12
5.2	Mutual and Automatic Aid.....	13
5.3	Alarm Monitoring and Emergency Dispatch .....	13
6.0	Analysis of Services Provided .....	13
6.1	Manual Fire Suppression – LLNL Site 200 .....	13
6.1.1	Minimum Performance Measure – LLNL S-200.....	13
6.1.2	Performance Summary – Manual Fire Fighting LLNL Site 200 .....	14
6.1.3	Services Provided – Manual Fire Fighting LLNL Site 200.....	14
6.1.4	Performance Status -- Manual Firefighting LLNL Site 200.....	15
6.1.5	Observations – Manual Firefighting Site 200.....	15
6.2	Manual Fire Suppression – Site 300 .....	15
6.2.1	Minimum Performance Measure – Site 300 .....	15
6.2.2	Performance Summary – Manual Firefighting Site 300.....	16
6.2.3	Services Provided – Manual Fire Fighting Site 300 .....	16
6.2.4	Performance Status – Manual Firefighting Site 300.....	18
6.2.5	Observations – Manual Firefighting Site 300.....	18
6.3	Emergency Medical Service.....	18
6.3.1	Minimum Performance Measure – EMS .....	18
6.3.2	Performance Summary -- EMS.....	18
6.3.3	Services Provided – EMS .....	18
6.3.4	Performance Status Summary -- EMS.....	19
6.3.5	Observations – Emergency Medical Service .....	19
6.4	Hazardous Materials.....	19
6.4.1	Minimum Performance Measure – HazMat .....	19
6.4.2	Performance Summary -- HAZMAT .....	20

- 6.4.3 Services Provided -- HazMat ..... 20
- 6.4.4 Performance Status Summary – HazMat ..... 21
- 6.4.5 Observations – HazMat..... 21
- 6.5 Technical Rescue..... 21
  - 6.5.1 Performance Requirements – Technical Rescue..... 21
  - 6.5.2 Performance Summary – Technical Rescue ..... 22
  - 6.5.3 Services Provided – Technical Rescue ..... 22
  - 6.5.4 Performance Status Summary – Technical Rescue ..... 22
  - 6.5.5 Observations – Technical Rescue ..... 22
- 6.6 Response to a Second Incident..... 23
  - 6.6.1 Minimum Performance Requirements ..... 23
  - 6.6.2 Performance Summary – Second Incident..... 23
  - 6.6.3 Services Provided – Second Incident..... 23
  - 6.6.4 Performance Status – Second Incident ..... 23
  - 6.6.5 Observations – Second Incident..... 23
- 6.7 Emergency Communications ..... 24
  - 6.7.1 Minimum Performance Requirements ..... 24
  - 6.7.2 Performance Summary – Emergency Communications ..... 24
  - 6.7.3 Services Provided – Emergency Communications ..... 24
  - 6.7.4 Performance Status – Emergency Communications..... 26
  - 6.7.5 Observations – Emergency Communications ..... 27
- 6.8 Training and Certification ..... 27
  - 6.8.1 Minimum Performance Requirements -- Training ..... 27
  - 6.8.2 Performance Summary – Training..... 27
  - 6.8.3 Services Provided -- Training ..... 28
  - 6.8.4 Performance Status -- Training..... 29
  - 6.8.5 Observations – Training..... 30
- 6.9 Pre-Fire Plans ..... 30
  - 6.9.1 Minimum Performance Requirements – Pre-Fire Plans ..... 30
  - 6.9.2 Performance Summary – Pre-Fire Plans..... 30
  - 6.9.3 Services Provided – Pre-Fire Plans..... 30
  - 6.9.4 Performance Status – Pre-Fire Plans..... 31
  - 6.9.5 Observations – Pre-Fire Plans..... 31
- 6.10 Emergency Response Apparatus ..... 31
  - 6.10.1 Minimum Performance Requirements – Emergency Apparatus ..... 31
  - 6.10.2 Performance Summary – Emergency Apparatus..... 31
  - 6.10.3 Services Provided – Emergency Apparatus ..... 32
  - 6.10.4 Performance Status – Emergency Apparatus..... 33
  - 6.10.5 Observations – Emergency Apparatus..... 33

## 1.0 Introduction and Executive Summary

### 1.1 Introduction

This document was prepared by John A. Sharry, LLNL Fire Marshal and Division Leader for Fire Protection and was reviewed by LLNL Emergency Management Department Head, James Colson. This document is the second of a two-part analysis of Emergency Response Capabilities of Lawrence Livermore National Laboratory. The first part, 2009 Baseline Needs Assessment Requirements Document established the minimum performance criteria necessary to meet mandatory requirements. This second part analyses the performance of Lawrence Livermore Laboratory Emergency Management Department to the contents of the Requirements Document.

The document was prepared based on an extensive review of information contained in the 2009 BNA, a review of Emergency Planning Hazards Assessments, a review of building construction, occupancy, fire protection features, dispatch records, LLNL alarm system records, fire department training records, and fire department policies and procedures.

On October 1, 2007 LLNL contracted with the Alameda County Fire Department (ACFD) to provide emergency response services. The emergency response services contract was again awarded to the ACFD in 2011 with a start date of July 1, 2012. The new contract included some staffing changes that were considered equivalent to those previously provided. Those changes are reflected in this document.

### 1.2 Executive Summary – Performance Assessment

#### 1.2.1 Performance Status – Manual Firefighting LLNL Site 200

**Table 1.2.1 Performance Status Summary Manual Firefighting Site 200**

Type Incident	Responder	Minimum Staffing (persons)	Total Response Time	Performance Criteria	Criterion Met or Not Met
Fire Sprinklered Bldg	1 <sup>st</sup> Unit	4	380	90 %	Met (95.6%)
	1 <sup>st</sup> Alarm	1	620		
Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit	4	380	90 %	Met (95.6%)
	1 <sup>st</sup> Alarm	13	620		
Wildland Fire	Fire Attack	4	440	90%	Met
	Batt Chief	1	620		

#### 1.2.1.1 Observations – Manual Firefighting LLNL Site 200

None

**1.2.2 Performance Status Manual Firefighting – Site 300**

**Table 1.2.2 Performance Status Summary – Fire Response S-300**

Type Incident	Responder	Minimum Staffing (persons)	Total Response Time	Performance Criteria	Performance Criterion Met or Not Met
GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit Batt Chief	4 1	380 sec. 1800 sec.	90 %	Met (95%)
GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	380 sec. 1800 sec.	90 %	Met (95%)
Non GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 1	960 sec. 2760 sec.	90 %	Not Evaluated
Non GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	960 sec. 2760 sec.	90 %	Not Evaluated
Wildland Fire	Fire Attack Batt Chief	4 1	1020 sec. 2760 sec.	90%	Not Evaluated

**1.2.2.1 Observations – Manual Firefighting Site 300**

None

**1.2.3 Performance Status – Emergency Medical Service**

**Table 1.2.3 Performance Status Summary -- EMS**

Type Incident	Responders	Minimum Staffing (persons)	Response Time	Performance Criteria	Performance Criterion Met or Not Met
All EMS Except Non GSA Site 300	1 <sup>st</sup> Responder Transport	1 ALS 2 BLS	480 sec.	90%	Met
EMS Non GSA Site 300	1 <sup>st</sup> Responder Transport	1 ALS 2 BLS	900 sec.	90%	Not Evaluated

**1.2.3.1 Observations – Emergency Medical Service**

None

**1.2.4 Performance Status – Hazardous Materials**

**Table 1.2.4 Performance Status Summary -- HAZMAT**

Staffing	Training Level	Performance Criterion	Performance Criterion Met or Not Met
<b>Investigation Level Incident</b>			
4	Trained Personnel 380 sec. Response time	90%	Met
<b>Level I Incident</b>			
12	Trained Personnel		Met
<b>Level II Incident</b>			
17	Trained Personnel		Met



**1.2.4.1 Observations – Hazardous Materials**

None

**1.2.5 Performance Status – Technical Rescue**

**Table 1.2.5 Performance Status Summary – Technical Rescue**

Location	Responders	Minimum Staffing (persons)	Total Response Time	Performance Criterion	Performance Criterion Met or Not Met
S-200, Sandia/CA GSA Area S-300	Operations Level	5	380 sec.	90 %	Met
S-200, Sandia/CA GSA Area S-300	Technician Level	7	620 sec.	90 %	Met
Non GSA Area S-300	Operations Level	5	960 sec.	90 %	Met
Non GSA Area S-300	Technician Level	7	2760 sec.	90 %	Met

**1.2.5.1 Observations – Technical Rescue**

None

**1.2.6 Performance Status – Second Incident**

**Table 6.6.4 Performance Status -- Second Incident**

Type Incident	Responders	Total Response Time	Performance Criteria	Criterion Met or Not Met
Second Incident	1 Company	1240 seconds	90 %	Met

**1.2.6.1 Observations – Second Incident**

None.

**1.2.7 Performance Status -- Emergency Communications**

**Table 1.2.6 Performance Status Summary – Emergency Communications**

<b>Event</b>	<b>Time Criteria</b>	<b>Performance</b>	<b>Criterion Met or Not Met</b>
Dispatcher training	N/A	NFPA 1061	Met
Answer 911 phone	15 seconds	95%	Met
	40 seconds	99%	Met
Acknowledge alarm	15 seconds	95%	Not Met (90%)
	40 seconds	99%	Not Met (96.3%)
Dispatch emergency	60 seconds	80%	Met (88.7%)
	106 seconds	95%	Not Met (93.8%)
Lab Alarms transmit alarms to ACRECC	45 seconds	95%	Met
ACRECC and/or Lab Alarms Notify Appropriate Party of Supervisory or Trouble Alarm	600 seconds	95%	Met
Dispatch emergency	60 seconds	95%	Not Met (89%)
	90 seconds	99%	Not Met (96%)

**1.2.7.1 Observations – Emergency Communications**

1. ACRECC could improve time performance on dispatch and alarm acknowledgement times. One means of improving alarm acknowledgment times is to have the alarms received by the LLNL fire alarm system on the “Fire” screen automatically dump into the CAD system creating a “waiting call” for dispatch.
2. Sandia/CA should improve emergency alarms processing time by having the LLNL fire alarm system be their primary system, reporting all information directly to the system rather than have the CAS operator call with detailed information.
3. The Sandia/CA CAS should be upgraded by either providing the CAS operators training and procedures to meet NFPA 1221 standards or moving the function of the 911 answering point to ACRECC.

**1.2.8 Performance Status – Training and Certification**

**Table 1.2.8 Performance Status Summary - Training**

<b>Personnel</b>	<b>Performance Measure</b>	<b>Performance Criterion Met or Not Met</b>
Entry level	Qualifications are established for entry-level fire department personnel that include medical and physical performance criteria.	Met
Entry level	There is an established training criterion for minimum performance of entry-level personnel.	Met
Incumbents	There is an established on-going training criterion for training for incumbents.	Met
Officers	There is a minimum training criteria established for fire officers or supervisors of emergency responder.	Met
Special Operations	There is a minimum training criteria established for special operations such as hazardous materials and technical rescue.	Met
Drills and Exercises	There is an established program of drills and exercises at various facilities on LLNL site.	Met
All	Documented training records exist for each individual.	Met

**1.2.8.1 Observations – Training and Certification**

None

**1.2.9 Performance Status – Pre-Fire Plans**

**Table 1.2.9 Performance Status Summary– Pre-Fire Plans**

<b>Performance Measure</b>	<b>Frequency</b>	<b>Performance Criterion Met or Not Met</b>
Provide pre-fire plans for all buildings	Annually	Met
Provide written standard operating procedures for response to occupancies with hazardous materials or other unique hazards	Annually	Met

### 1.2.9.1 Observations – Pre-Fire Plans

1. Emergency Call Out Lists and Special Information Sheets could be improved by proper quarterly review by ACFD to insure quarterly updates are placed in the Runcards in a timely manner.

### 1.2.10 Performance Status – Emergency Response Apparatus

**Table 1.2.10 Performance Status Required First Line & Reserve Apparatus**

Type Apparatus	Number	Comment	Criterion Met or Not Met
Engine	3	Livermore Site – 2, S-300 – 1	Met
Aerial Ladder	1	Livermore Site	Met
Ambulance	2	Livermore Site – 1, S-300 – 1	Met
Type 3 Engine	2	Livermore Site – 1, S-300 – 1	Met
Type 4 Engine	2	Livermore Site – 1, S-300 – 1	Met
Hazardous Materials	1	Responds both sites	Met
Command	1	Battalion Chief	Provided by ACFD
Reserve Type 1 Engine	1	1 Reserve per 5 in front-line service	Not Met
Reserve Ambulance	1	1 Reserve per 5 in front-line service	Met
Reserve Type 3 Engine	1	1 Reserve per 5 in front-line service	Met
Reserve Type 4 Engine	1	1 Reserve per 5 in front-line service	Met
Apparatus Plan		Written 5 year Plan	Met
Apparatus Maintenance		Per NFPA and GSA Fleet Requirements	Met

#### 1.2.10.1 Observations – Emergency Apparatus

1. Internally, LLNL should resolve the philosophy under which it will operate the emergency vehicle fleet. Is the use of ACFD reserve apparatus an acceptable risk?

## 2.0 Purpose

The purpose of this document is to compare the actual response capabilities of Lawrence Livermore National Laboratory to the minimum performance criteria established in the 2012 Baseline Needs Assessment Requirements Document.

### **3.0 Scope**

This compliance assessment covers the following items as developed by the Baseline Needs Assessment Requirements Document.:

- Response to fire emergencies
- Response to medical emergencies
- Response to hazardous materials emergencies
- Response to situations requiring technical rescue
- Response to a second incident
- Fire fighter collateral duties
- Emergency communications and dispatch requirements
- Training requirements for emergency responders
- Pre-fire plan requirements including Emergency Planning Hazard Assessments
- Emergency response apparatus
- Other fire protection program components (typically, those requiring fire protection engineering support) are not included.

### **4.0 Assumptions**

This Compliance Assessment is prepared based on the 2012 Baseline Needs Assessment Requirements Document. The Baseline Needs Assessment identifies the emergency response requirements taken from applicable regulatory documents (primarily NFPA Codes and Standards) and modified as needed for application at the LLNL and Sandia/CA sites. The Baseline Needs Assessment defines the criteria used to evaluate compliance of the emergency response capability.

### **5.0 Emergency Response Organization**

#### **5.1 Alameda County Fire Department**

The Alameda County Fire Department (ACFD) is a full time fire department was formed on July 1, 1993 as a dependent special district with the Alameda County Board of Supervisors as its governing body. This consolidation brought together into a single jurisdiction the Castro Valley Fire Department, the Eden Fire Department and County Fire Patrol (each a dependent special district under the Board of Supervisors). The department provides all risk service to those unincorporated areas of Alameda County and provides services under contract to the Cities of Dublin, Emeryville, Newark, San Leandro, Union City, as well as Lawrence Berkeley National Laboratory.

Effective October 1, 2007, ACFD was awarded a contract to provide emergency response services for Lawrence Livermore National Laboratory including LLNL's Site 300 and Sandia/CA. In January 2008, ACFD also assumed responsibility for running the Alameda County Regional Emergency Communications Center (ACRECC) and became responsible for monitoring the LLNL Fire and Emergency Voice Alarm System, which included monitoring fire alarms for not only LLNL, but also Sandia/CA, Lawrence

Berkeley National Laboratory, and Parks Reserve Training Center. The Emergency Response Contract was again awarded to ACFD in 2011 with a start date of July 1, 2012.

### **5.1.1 ACFD Stations and Staffing**

ACFD operates 35 fire stations covering approximately 508 square miles in the communities it serves. The LLNL fire stations are numbers 20 and 21 in the county system. Overall, ACFD has over 400 personnel providing 24/7 coverage which includes 3 Battalions, 30 engine companies, 5 truck companies and specialized equipment such as an Air/Light/Support Unit, a Heavy Rescue Vehicle, a Hazardous Materials Response Vehicle, a 2,500 gallon Water Tender, and a dozer.

ACFD provides three companies at LLNL. At Site 200, each company has a minimum staffing of a Captain and two fire fighters. At Site 300, the company has minimum staffing of a Captain and three firefighters. ACFD has co-located Engine 8 at Station 20 giving LLNL access to a third three person company when that company is not otherwise committed. In addition to fire fighter qualifications, all company members are Emergency Medical Technicians with one being a Paramedic. At Station 20, which serves LLNL Site 200 and the Sandia/CA campus, there are two companies. Station 20 companies are required to be HazMat Companies, meaning that all members of these companies are required to have Hazardous Materials Technician qualifications with the Captain having Hazardous Materials Specialist qualifications.

Upon award of the contract for emergency services, ACFD absorbed all current LLNL fire fighters into their organization so there was no break in service, qualifications, or level of security clearance. All fire fighters permanently assigned to LLNL possess a DOE security clearance and, in addition, 130 ACFD members in other stations have security clearances and qualifications to work at LLNL.

Before being able to work at either of the LLNL fire stations an ACFD employee must take a minimum level LLNL site-specific training. After working 10 shifts at LLNL an ACFD member has to take the remaining LLNL specific training. Personnel not assigned to LLNL on a permanent basis are only permitted to fill one of the four positions on any company. In that way, staff temporarily assigned to LLNL, are supported by personnel who are fully LLNL qualified.

The LLNL Battalion Chiefs were absorbed into ACFD and became the chief officers assigned to ACFD Battalion 3. Although they serve all of Battalion 3, they are housed in Station 20 on the LLNL campus.

Since the beginning of the ACFD contract, several of the original LLNL fire fighters and one Battalion Chief have either retired or “bid” another ACFD station. The Battalion Chief’s position was filled by an existing ACFD Battalion Chief who is assigned to LLNL on a permanent basis. In addition to the Battalion Chiefs, ACFD provides a Division Chief to serve as liaison to LLNL. This Division Chief is also an emergency responder.

## 5.2 Mutual and Automatic Aid

LLNL, as an entity, is still signatory to several mutual and automatic aid agreements. LLNL meets its obligations to these agreements through its subcontractor, the Alameda County Fire Department. The agreements are as follows:

- ♦ Automatic Aid Agreement with the Livermore-Pleasanton Fire Department
- ♦ Alameda County Mutual Aid Agreement
- ♦ Mutual Threat Zone MOU with California Division of Forestry (provides automatic aid for wildland fires at S-300)
- ♦ Mutual Fire Protection Resources Agreement with City of Livermore

## 5.3 Alarm Monitoring and Emergency Dispatch

From its inception in early 2001, the organization that became the Alameda County Emergency Communications Center (ACRECC) was operated by the LLNL Emergency Management Division and later the Emergency Management Department. Beginning in January 2008, operation of ACRECC was turned over to ACFD and certain alarm monitoring and emergency activities became part of the contract between ACFD and LLNL. Included in those services are monitoring the LLNL fire alarm system, which includes alarms being received from Sandia/CA, Lawrence Berkeley National Laboratory, and Parks Army Training Center. In addition, ACRECC is responsible for the following functions and operations:

- ♦ Answering emergency (911) telephone calls.
- ♦ Dispatching emergency fire and emergency medical apparatus via station alerting systems and radio for LLNL and Sandia National Laboratory.
- ♦ Monitoring and responding to active fire alarms for LLNL and Sandia National Lab.
- ♦ Tracking emergency and non-emergency response resources via radio and telephone.
- ♦ Providing emergency pager notification for deaf employees.
- ♦ Making Emergency Alert System announcements for Site 200 and 300.
- ♦ Participating in facility and site drills and exercises as required by DOE Order 151.1.C.
- ♦ Coordinating emergency response with LLNL and Sandia National Laboratory Protective Force personnel.

## 6.0 Analysis of Services Provided

### 6.1 Manual Fire Suppression – LLNL Site 200

#### 6.1.1 Minimum Performance Measure – LLNL S-200

##### Sprinklered Buildings

*Respond to reported fires from buildings with sprinkler protection with an alarm assignment of two engine companies and a Battalion Chief in a manner to provide for arrival of the first engine company within a Total Response Time of 380*

*seconds 90% of the time and the arrival of the remainder of the alarm assignment within a Total Response Time of 620 seconds 90% of the time.*

**Unsprinklered Buildings**

*Respond to reported fires from buildings without sprinkler protection with an alarm assignment of three engine companies and a Battalion Chief in a manner to provide for arrival of the first engine company within a Total Response Time of 380 seconds 90% of the time and the arrival of the remainder of the alarm assignment within a Total Response Time of 620 seconds 90% of the time.*

**Wildland Fire**

*Respond to a reported wildland fire within a Total Response Time for a two-flank wildland fire attack of 440 seconds 90% of the time and provide for the arrival of a Battalion Chief within a Total Response Time of 620 seconds 90% of the time.*

**6.1.2 Performance Summary – Manual Fire Fighting LLNL Site 200**

**Table 6.1.2 Performance Summary – Manual Fire Fighting Site 200**

Type Incident	Responders	Minimum Staffing (persons)	Total Response Time	Performance Criteria
Fire Sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	7	380 620	90%
Fire Unsprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	11	380 620	90%
Wildland Fire	Fire Attack 1 <sup>st</sup> Alarm	4 5	440 620	90%

**6.1.3 Services Provided – Manual Fire Fighting LLNL Site 200**

ACFD provides LLNL with minimum on-duty staffing at Fire Station 20 (LLNL Site 200) of seven persons (2 Captains, 4 Fire Fighters, and 1 Battalion Chief). In addition, ACFD has stationed Engine 8 at LLNL which gives LLNL access to 3 additional personnel most of the time (approx. 60% of the time). Having Engine 8 stationed at LLNL has also reduced the number of off-site emergency responses by LLNL companies by more than 80%. This staffing is sufficient to provide the minimum response to buildings protected by automatic sprinklers.

For fires in unprotected structures, which represent about 40% of the structures on LLNL property, but only 10% of the building area, the Fire Department at LLNL does not have sufficient resources to meet the minimum initial attack criteria and relies on mutual and automatic aid.

The ACFD standard response schedule for a structure fire calls for the response of three engines, one truck, and a Battalion Chief.



To determine compliance with the Total Response Time criterion, dispatch records for 36 months were examined. Disallowing any incident with incomplete or inconsistent information, 744 incidents were evaluated for response time. Response times for first unit exceeded minimums by meeting the time criterion 95.6% of the time. There were insufficient data on first alarm response times to draw any conclusions, however, the two times a full first alarm was required, the criterion was met. Wildland responses on Site 200 were too few to draw any conclusions, but are evaluated as met based on structure fire response times.

Firefighters at LLNL have the following corollary duties: Hose testing, hydrant flow testing and lubrication, and incidental issuance of hot work permits (when fire inspectors are not on duty). Station 20 personnel have a limited fire inspection assignment of 30 buildings per month, while Station 21 personnel perform all monthly fire prevention inspections. None of these assignment impede emergency response.

**6.1.4 Performance Status -- Manual Firefighting LLNL Site 200**

**Table 6.1.4 Performance Status Summary – Manual Firefighting Site 200**

Type Incident	Responder	Minimum Staffing (persons)	Total Response Time	Performance Criteria	Criterion Met or Not Met
Fire Sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	7	380 620	90 %	Met (95.6%)
Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	11	380 620	90 %	Met (95.6%)
Wildland Fire	Fire Attack 1 <sup>st</sup> Alarm	4 5	440 620	90%	Met

**6.1.5 Observations – Manual Firefighting Site 200**

None

**6.2 Manual Fire Suppression – Site 300**

**6.2.1 Minimum Performance Measure – Site 300**

GSA Sprinklered Buildings –

*Respond to alarms in buildings with sprinkler protection within the General Services Area of Site 300 with a alarm assignment of one engine company (minimum staff of 4) to provide for arrival within a Total Response Time of 380 seconds 90% of the time and provide for the arrival of a Battalion Chief within a Total Response Time of 1800 seconds 90% of the time.*

GSA Non-Sprinklered Buildings

*Respond to alarms in buildings without sprinkler protection within the General Services Area of Site 300 with alarm assignment of three engine companies (each with a staff of 4) and a Battalion Chief in a manner to provide for arrival of the first engine company within a Total Response Time of 380 seconds 90% of the*

*time and the arrival of the remainder of the alarm assignment within a Total Response Time of 1800 seconds 90% of the time.*

Outside of GSA Sprinklered Buildings

*Respond to fire incidents outside of the general services area with an alarm assignment of one engine company to provide for arrival within a Total Response Time of 960 seconds 90% of the time and provide for the arrival of a Battalion Chief within a Total Response Time of 2760 seconds 90% of the time.*

Outside of GSA Non-Sprinklered Buildings

*Respond to alarms in buildings without sprinkler protection outside of the General Services Area of Site 300 with alarm assignment of three engine companies (each with a staff of 4) and a Battalion Chief in a manner to provide for arrival of the first engine company within a Total Response Time of 960 seconds 90% of the time and the arrival of the remainder of the alarm assignment within a Total Response Time of 2760 seconds 90% of the time.*

Wildland Fires

*Respond to a reported wildland fire at Site 300 within a Total Response Time for a two-flank wildland fire attack of 1020 seconds 90% of the time and provide for the arrival of a Battalion Chief within a Total Response Time of 2760 seconds 90% of the time.*

**6.2.2 Performance Summary – Manual Firefighting Site 300**

**Table 6.2.2 Performance Summary – Manual Firefighting S-300**

Type Incident	Responders	Minimum Staffing (persons)	Total Response Time	Performance Criteria
GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit Battalion Chief	4 1	380 sec. 1800 sec.	90 %
GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	380 sec. 1800 sec.	90 %
Non GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 1	960 sec. 2760 sec.	90 %
Non GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	960 sec. 2760 sec.	90 %
Wildland Fire	Fire Attack Battalion Chief	4 1	1020 sec. 2760 sec.	90%

**6.2.3 Services Provided – Manual Fire Fighting Site 300**

ACFD has minimum on-duty staffing at Fire Station 21 (Site 300) of four persons (1 Captain, 3 Fire Fighters). An engine company and chief officer are dispatched from the Livermore Site on every fire response, but with an extended arrival time due to travel distance.

The rural nature of Site 300 dictates specialized tactics for structure fires in order to meet provisions of the various requirement documents concerning the 2In/2Out fire fighter safety requirement. If an interior structural fire as defined within the OSHA regulation and NFPA 1500 is encountered, the first arriving engine company will perform other functions such as, rescue, treatment of the injured, establishment of a water supply, stretch hose lines in preparation for fire attack, and protect exposures until the arrival of the second engine company. In concert with the OSHA rule and NFPA 1500 requirements, a rescue attempt can be made before the arrival of the second engine company if an imminent life-threatening situation is encountered.

Considering the remote location of Site 300, and considering that many of buildings at Site 300 outside of the GSA area will require a 30-minute cooling off period prior to any entry, the fire incident response plan and tactical plan is appropriate, meets the intent of the requirement documents and meets the minimum response criteria established in the Baseline Needs Assessment.

Wildland fire control at Site 300 is a hazard that is mitigated significantly by the annual prescribed burn. The prescribed burn confines a potential fire to the property boundaries of Site 300, eliminates the fuel in high fire probability areas (high explosive test areas), and generally breaks the fuel path, thereby limiting the size of potential fires in other areas. The Fire Department has been successfully conducting prescribed burns at Site 300 for over 45 years. Three documents describe and regulate the prescribed burns, the *Prescribed Burning/Smoke Management Plan<sup>i</sup> Site 300 Explosive Test Facility Prescribed Burn/Smoke Management Plan<sup>ii</sup>* and EMD Procedure 1606, *Tactical Plan-Command Procedures: Controlled Burns at Site 300<sup>iii</sup>*.

Because of the prescribed burn process, fire fighters assigned to Station 21 are well trained and experienced with “back-fire” techniques and use that technique extensively as a fire control measure when responding to wildland fires at Site 300. Staffing at Station 21 allows a standard two-flank attack. LLNL fire fighters have a history of aggressive wildland fire attack at Site 300 and control most fires with the initial response. As with all fire incidents, additional equipment is dispatched from the Livermore Site, but with an extended arrival time. Wildland fires beyond the capabilities of the initial fire attack are usually held in check by the prescribed burn boundaries, but LLNL’s Mutual Threat Zone Agreement with the CAL Fire allows for specialized resources such as firefighting helicopters and tankers in addition to normal wildland mutual aid.

Response statistics for the past 36 months indicate a continued very low number of responses at Site 300. A total of 52 responses were evaluated, most (46) being within the GSA area. Responses in non GSA areas and wildland fires were too few to evaluate.

The Fire Department also supports the community surrounding Site 300 by providing fire response to the areas immediately adjacent to Site 300 property, an area with no recognized fire department. During the past three calendar years, off-site responses average 155 per year, overwhelmingly these were EMS responses to the Carnegie State Vehicular Recreational Area (Carnegie SVRA).

The ACFD wildland fire incident response plan and tactical plan is appropriate and meets the minimum response criteria established in this assessment.

**6.2.4 Performance Status – Manual Firefighting Site 300**

**Table 6.2.4 Performance Status Summary – Fire Response Site 300**

Type Incident	Responder	Minimum Staffing (persons)	Total Response Time	Performance Criteria	Performance Criterion Met or Not Met
GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit Batt Chief	4 1	380 sec. 1800 sec.	90 %	Met (95%)
GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	380 sec. 1800 sec.	90 %	Met (95%)
Non GSA Area Fire Sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 1	960 sec. 2760 sec.	90 %	Not Evaluated
Non GSA Area Fire Non-sprinklered Bldg	1 <sup>st</sup> Unit 1 <sup>st</sup> Alarm	4 13	960 sec. 2760 sec.	90 %	Not Evaluated
Wildland Fire	Fire Attack Batt Chief	4 1	1020 sec. 2760 sec.	90%	Not Evaluated

**6.2.5 Observations – Manual Firefighting Site 300**

None

**6.3 Emergency Medical Service**

**6.3.1 Minimum Performance Measure – EMS**

Site 200, Sandia/CA, GSA Area of S-300

*Arrive on scene of an EMS incident on the at Site 200, Sandia/CA, or the GSA Area of S-300 with first responder/transport ALS capability of one ALS and two BLS qualified responders within a response time of 480 seconds 90% of the time.*

Outside of GSA Area of S-300

*Arrive on the scene of an EMS incident Outside of the GSA Area of Site 300 with first responder/transport ALS capability of one ALS and two BLS qualified responders within a Total Response Time of 2,100 seconds 90% of the time.*

**6.3.2 Performance Summary -- EMS**

**Table 6.3.2 Performance Summary -- EMS**

Type Incident	Responders	Minimum Staffing (persons)	Response Time
All EMS Except Non GSA Site 300	1 <sup>st</sup> Responder/Transport	1 ALS 2 BLS	480 sec.
EMS Non GSA Site 300	1 <sup>st</sup> Responder/Transport	1 ALS 2 BLS	900 sec.

**6.3.3 Services Provided – EMS**

ACFD staffs every company with one ALS qualified fire fighter. All fire fighters are BLS qualified as Emergency Medical Technician 1 with the transport or ambulance training module.

All LLNL ambulances are ALS qualified. LLNL responds each engine company as a first responder ALS unit; thus, each engine is equipped with the necessary ALS equipment and drugs.

Fire Station 20 houses a first line ambulance and the reserve ambulance. The reserve ambulance is equipped and maintained as a first response unit and can immediately be used for a second or simultaneous ambulance response. As with fire responses, a unit is dispatched from the Livermore site to any response at Site 300. In this case, an ambulance will respond from Fire Station 20 to any EMS call at Site 300 to assist, provide back-up, and if necessary cover-in at Station 2.

In evaluating 36 months of data for EMS responses, which totals 205 incidents, the performance was just short of the 90% criteria at 89.6%. This was judged as meeting the performance criterion. There were insufficient responses outside the GSA area at S-300 to evaluate.

**6.3.4 Performance Status Summary -- EMS**

**Table 6.3.4 Performance Status Summary -- EMS**

Type Incident	Responders	Minimum Staffing (persons)	Response Time	Performance Criteria	Performance Criterion Met or Not Met
All EMS Except Non GSA Site 300	1 <sup>st</sup> Responder Transport	1 ALS 2 BLS	480 sec.	90%	Met
EMS Non GSA Site 300	1 <sup>st</sup> Responder Transport	1 ALS 2 BLS	900 sec.	90%	Not Evaluated

**6.3.5 Observations – Emergency Medical Service**

None

**6.4 Hazardous Materials**

**6.4.1 Minimum Performance Measure – HazMat**

*Initial response to a hazardous materials incident at Site 200, Sandia/CA, and the Site 300 General Services Areas will arrive within a Total Response Time of 380 seconds 90% of the time.*

*Provide sufficient personnel trained to the proper level for a Level I or Level II hazardous materials incident prior to beginning any operations activities.*

**6.4.2 Performance Summary -- HAZMAT**

**Table 7.6.4 Performance Summary -- HAZMAT**

<b>Task</b>	<b>Staffing</b>	<b>Training Level</b>
<b>Investigation Level Incident</b>		
Incident Commander	1	Hazmat IC & Technician
HazMat Group	3	Awareness
<b>Total</b>	4	380 sec. 90% of the time
<b>Level I Incident</b>		
Incident Commander	1	Hazmat IC & Specialist
Safety and Tech Reference	2	HM Safety and Technician
HazMat Group	7	Technician
Medical Group	2	Operations & EMT
<b>Total</b>	12	
<b>Level II Incident</b>		
Incident Commander	1	Hazmat IC & Specialist
Safety and Tech Reference	3	Specialists & Technicians
HazMat Group	9	Technician & Operations
Time Recorder & Access Control	2	Operations
Medical Group	2	Operations and EMT
<b>Total</b>	17	

**6.4.3 Services Provided -- HazMat**

The contract with ACFD provides that Station 20 is a HazMat station and all fire fighters assigned to that station are certified Hazardous Materials Technicians and all Officers be certified Hazardous Materials Specialists. Station 21 does not require that constant level of staffing because of the general lack of hazardous materials.

Station 20 can handle an initial level and most Level 1 incidents with on-duty staffing. Full-blown hazardous materials incidents require significant equipment and staffing resources. The Fire Department on-duty staffing at LLNL, like most local agencies, does not have the capability to respond to a large hazardous materials incident without mutual aid assistance. LLNL and ACFD have developed a regional approach to hazardous materials response utilizing the County Mutual Aid Plan response to large hazardous materials incidents.

While the LLNL is able to maintain the equipment it has, it does not have the funds to update and upgrade to the newest technology equipment. That situation is improving with ACFD committing to provide new advanced diagnostic equipment to bring the LLNL Hazardous Materials Unit up to the standards of a Type 1 Hazardous Materials unit by the third year of the contract. During the past 36 months, LLNL has had to call in the resources from other ACFD stations to deal with spills of unknown materials that could have been handled locally, if the LLNL owned apparatus had been equipped with the most modern equipment. This commitment by ACFD will enhance the LLNL historical desire to be able to “stand alone” in the event of a large area disaster.

The LLNL Fire Department can meet the minimum response criteria contained in the Baseline Needs Assessment by a combination of on duty staffing and use of mutual aid.

**6.4.4 Performance Status Summary – HazMat**

**Table 7.6.4 Performance Status Summary -- HAZMAT**

Staffing	Training Level	Performance Criterion	Performance Criterion Met or Not Met
<b>Investigation Level Incident</b>			
4	Trained Personnel 380 sec. Response time	90%	Met
<b>Level I Incident</b>			
12	Trained Personnel		Met
<b>Level II Incident</b>			
17	Trained Personnel		Met

**6.4.5 Observations – HazMat**

None

**6.5 Technical Rescue**

**6.5.1 Performance Requirements – Technical Rescue**

*Respond to reported technical rescue incidents to provide rescue and extrication of victims of structural collapse, vehicle accidents, and construction accidents or confined space accidents at Site 200, Sandia/CA, and the GSA Area of Site 300 within a total response time of 360 seconds for an Operational Level Incident 90% of the time.*

*Respond to reported technical rescue incidents to provide rescue and extrication of victims of structural collapse, vehicle accidents, and construction accidents or confined space accidents at Site 200, Sandia/CA, and the GSA Area of Site 300 within a total response time of 600 seconds for a Technician Level Incident 90% of the time.*

*Respond to reported technical rescue incidents to provide rescue and extrication of victims of structural collapse, vehicle accidents, and construction accidents or confined space accidents in the Outside of the GSA Areas of S-300 within a total response time of 960 seconds for an Operational Level Incident 90% of the time.*

*Respond to reported technical rescue incidents to provide rescue and extrication of victims of structural collapse, vehicle accidents, and construction accidents or confined space accidents in the Outside of the GSA Areas of S-300 within a total response time of 2760 seconds for a Technician Level Incident 90% of the time.*

### 6.5.2 Performance Summary – Technical Rescue

**Table 6.5.2 Performance Summary – Technical Rescue**

Location	Responders	Minimum Staffing (persons)	Total Response Time	Performance Criteria
S-200, Sandia/CA GSA Area S-300	Operations Level	5	380 sec.	90 %
S-200, Sandia/CA GSA Area S-300	Technician Level	7	620 sec.	90 %
Non GSA Area S-300	Operations Level	5	960 sec.	90 %
Non GSA Area S-300	Technician Level	7	2760 sec.	90 %

### 6.5.3 Services Provided – Technical Rescue

The LLNL Fire Department responds to all technical rescue incidents on LLNL and Sandia property.

An Engine Company responds to known technical rescue incidents. The engine company is provided with a hydraulic rescue tool (often called the “jaws of life” by the media), cribbing, and air rescue bags (heavy duty air inflatable bags used to lift or move heavy objects). If the incident were identified as a confined space incident, the HazMat vehicle would also respond, since it carries the specialized confined space rescue equipment.

There were no technical rescue incidents in the data for the past 36 months, but response times for other incidents indicate that criterion will be met.

### 6.5.4 Performance Status Summary – Technical Rescue

**Table 6.5.2 Performance Summary – Technical Rescue**

Location	Responders	Minimum Staffing (persons)	Total Response Time	Performance Criterion	Performance Criterion Met or Not Met
S-200, Sandia/CA GSA Area S-300	Operations Level	5	380 sec.	90 %	Met
S-200, Sandia/CA GSA Area S-300	Technician Level	7	620 sec.	90 %	Met
Non GSA Area S-300	Operations Level	5	960 sec.	90 %	Met
Non GSA Area S-300	Technician Level	7	2760 sec.	90 %	Met

### 6.5.5 Observations – Technical Rescue

None



**6.6 Response to a Second Incident**

**6.6.1 Minimum Performance Requirements**

*Respond to a second simultaneous incident of any type with a single engine company within a Total Response Time of 1240 seconds 90 percent of the time.*

**6.6.2 Performance Summary – Second Incident**

**Table 6.6.1 Performance Summary -- Second Incident**

Type Incident	Responders	Total Response Time	Performance Criteria
Second Incident	1 Company	1240 seconds	90 %

**6.6.3 Services Provided – Second Incident**

Resources for a simultaneous second incident are expected to come from mutual or automatic aid. On a large incident usually one of the units that is part of the first alarm assignment will be diverted to the second incident. If all first alarm units are already “on scene” and committed, another engine will be dispatched. With all fire department in the Livermore Valley being dispatched by ACRECC, this is a seamless operation with the next closest engine being dispatch automatically. On working full first alarm incident, dispatch will start to move companies from farther away to fill-in those stations vacated by the initial response. This makes the response time considerably better that would normally be expected.

Based on the response times of first alarm units from what limited experience LLNL has experienced, it is expected that the response criterion will be met.

**6.6.4 Performance Status – Second Incident**

**Table 6.6.4 Performance Status -- Second Incident**

Type Incident	Responders	Total Response Time	Performance Criteria	Criterion Met or Not Met
Second Incident	1 Company	1240 seconds	90 %	Met

**6.6.5 Observations – Second Incident**

None.

**6.7 Emergency Communications**

**6.7.1 Minimum Performance Requirements**

*ACRECC shall provide evidence that their dispatch staff is trained to meet the qualifications of NFPA 1061 and is capable of meeting the provisions of Section 7.2 of NFPA 1221.*

*ACRECC shall provide evidence that alarms received, via telephone or alarms from LLNL’s site-wide alarm system, are answered or in the case of signals from the alarm system, acknowledged, within 15 seconds 95 % of the time and within 40 seconds 99% of the time.*

*ACRECC shall provide evidence that LLNL alarms are dispatched within 60 seconds 80% of the time and within 106 seconds 95% of the time.*

*Lab Alarms shall provide evidence that alarms are transmitted to ACRECC for dispatch within 45 seconds of receipt by Lab Alarms 95% of the time.*

*ACRECC and/ Lab Alarms will notify the appropriate party within 10 minutes of a supervisory or trouble alarm 95% of the time to allow for response of appropriate personnel.*

**6.7.2 Performance Summary – Emergency Communications**

**Table 6.4.3 Performance Summary – Emergency Communications**

<b>Event</b>	<b>Time Criterion</b>	<b>Performance</b>
Dispatcher training	N/A	NFPA 1061
ACRECC Answer or Acknowledge Alarm	15 seconds 40 seconds	95% 99%
ACRECC Dispatch Emergency	60 seconds 106 seconds	80% 95%
Lab Alarms transmit alarms to ACRECC	45 seconds	95%
ACRECC and/or Lab Alarms Notify Appropriate Party of Supervisory or Trouble Alarm	600 seconds	95%

**6.7.3 Services Provided – Emergency Communications**

LLNL monitors its fire alarm system through the LLNL Fire and Emergency Voice (FEVA) system. Alarms are transmitted via supervised telephone lines to the central processor where the alarms are processed and passed on to the Alameda County Regional Emergency Communications Center (ACRECC) for dispatch. During normal working hours (Monday through Friday 0700 hrs until 1700 hrs) the LLNL Lab Alarms desk screens alarms, with active alarms passed onto to ACRECC for dispatching. During off hours, ACRECC performs the monitoring function.

ACRECC dispatched over 90,000 incidents for consortium members during the last year. Staffing varies somewhat by season with a minimum of 7 dispatchers and a supervisor on duty at all times with additional dispatchers added during wildland season. Dispatchers receive 3 weeks of classroom training and approximately 4 months of one-on-one on the job training. All dispatchers received 48 hours of continuing training annually. This training is equal to the training provisions of NFPA 1061, *Standard for Professional Qualifications for Public Safety Telecommunicator*.

The dispatch center records all telephone and radio communications and retains those recordings for 100 days. Instant payback recorders are provided at each dispatch console. Fire alarm data is recorded by LLNL as part of their alarm system. Dispatch records are computerized and all information retained in electronic format. Fire apparatus in the ACRECC system use vehicle mounted laptops to communicate with the dispatch center for recording enroute times, on-scene times, and when available. Alarms are acknowledged by electronics means from each station. The center is provided with redundant emergency generators and has dispatch equipment on redundant Uninterruptable Power Supplies. ALCO Fire uses the Alameda County 800 MHz trunked radio system, but responses at LLNL are operated on a federal government 400 MHz trunked system. All fire departments in the Livermore Valley operate on the County's 800 MHz trunked system allowing for seamless communications during large emergencies. LLNL emergency vehicles are equipped with radios on both the County and LLNL systems. Both systems have redundant capability in the dispatch center.

ACRECC has a comprehensive set of operating procedures, including several that are unique to dispatching and handling of alarms. During the last BNA ACRECC was in transition with some procedures carried over from when the center was operated by the LLNL Fire Department, that situation has been corrected and all procedures have been updated and converted to ACRECC procedures.

The dispatch center is operated in accordance with the operational chapters of NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications System*, including the performance requirements for call handling. A review of 36 months of dispatch data for LLNL incidents indicates the following performance to the performance criteria of NFPA 1221:

88.7% of LLNL alarms are dispatched within 60 seconds

93.8% of LLNL alarms are dispatched with 106 seconds

Data for telephone call answering was not readily available but is reported to be within the performance criteria.

A review of alarm data from the LLNL Alarm System records indicated that acknowledgement times for fire alarms were 61.5% within 15 seconds, 96.3% within 40 seconds, and 98.9% within 60 seconds. This performance is very good, but could be improved by having alarms received by the alarm system "Fire" screen automatically dump into the CAD system creating a "waiting call" to be dispatched.

Responding to and making notifications of Trouble and Supervisory alarms is generally within the criterion, although there have been some glaring omissions with trouble alarms being unacknowledged for several hours. Those instances are considered

anomalies and the result of dispatchers being involved in higher priority activities. There is a concern, however, that as ACRECC become busier, the response to the non-emergency needs of LLNL will continue to deteriorate.

Alarms from Sandia/CA are routed to the Sandia Central Alarm Station (CAS) simultaneously with the LLNL alarm system, however, the data sent to the LLNL system is not complete for all building systems. The Sandia/CA CAS follows-up each alarm with a phone call to ACRECC to confirm receipt of the alarm and provide the additional information. The Sandia/CA emergency phone number is also answered in the Sandia CAS, information is taken and then passed on to ACRECC for dispatch. Both of these situations cause delay in the dispatching of emergency forces, which is unnecessary. Further, the training of the Sandia/CA CAS operators is reported to be less than that required for ACRECC, an issue that may be critical during an emergency call. Sandia/CA should consider having all alarm information come directly to the LLNL system to avoid delays in alarm processing. If the Sandia CAS is serving as the equivalent of a 911 center, there is a public expectation of a certain level of service as described in NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.<sup>iv</sup> The Sandia CAS should be upgraded by either providing the CAS operators training and procedures to meet NFPA 1221 standards or moving the function of the 911 answering point to ACRECC. If the 911 answering point is moved to ACRECC, the system can be arranged to allow Sandia CAS to monitor the calls and take over a call if it is not fire or emergency medically related.

#### 6.7.4 Performance Status – Emergency Communications

**Table 6.4.4 Performance Status Summary – Emergency Communications**

Event	Time Criteria	Performance	Criterion Met or Not Met
Dispatcher training	N/A	NFPA 1061	Met
Answer 911 phone	15 seconds	95%	Met
	40 seconds	99%	Met
Acknowledge alarm	15 seconds	95%	Not Met (90%)
	40 seconds	99%	Not Met (96.3%)
Dispatch emergency	60 seconds	80%	Met (88.7%)
	106 seconds	95%	Not Met (93.8%)
Lab Alarms transmit alarms to ACRECC	45 seconds	95%	Met
ACRECC and/or Lab Alarms Notify Appropriate Party of Supervisory or Trouble Alarm	600 seconds	95%	Met
Dispatch emergency	60 seconds	95%	Not Met (89%)
	90 seconds	99%	Not Met (96%)

**6.7.5 Observations – Emergency Communications**

1. ACRECC could improve time performance on dispatch and alarm acknowledgement times. One means of improving alarm acknowledgment times is to have the alarms received by the LLNL fire alarm system on the “Fire” screen automatically dump into the CAD system creating a “waiting call” for dispatch.
2. Sandia/CA should improve emergency alarms processing time by having the LLNL fire alarm system as their primary system, reporting all information directly to the system rather than have the CAS operator call with detailed information.
3. The Sandia/CA CAS should be upgraded by either providing the CAS operators training and procedures to meet NFPA 1221 standards or moving the function of the 911 answering point to ACRECC.

**6.8 Training and Certification**

**6.8.1 Minimum Performance Requirements -- Training**

*Qualifications are established for entry-level fire department personnel that include medical and physical performance criteria.*

*There is an established training criterion for minimum performance of entry level personnel.*

*There is an established on-going training criterion for training for incumbents.*

*There is a minimum training criteria established for fire officers or supervisors of emergency responder.*

*There is a minimum training criteria established for special operations such as hazardous materials and technical rescue.*

*There is an established program of drills and exercises at various facilities on LLNL site.*

*There are documented training records exist for each individual.*

**6.8.2 Performance Summary – Training**

**Table 6.5.2 Performance Summary - Training**

<b>Personnel</b>	<b>Performance Measure</b>
Entry level	Qualifications are established for entry-level fire department personnel that include medical and physical performance criteria.
Entry level	There is an established training criterion for minimum performance of entry-level personnel.
Incumbents	There is an established on-going training criterion for training for incumbents.

Officers	There is a minimum training criteria established for fire officers or supervisors of emergency responder.
Special Operations	There is a minimum training criteria established for special operations such as hazardous materials and technical rescue.
Drills and Exercises	There is an established program of drills and exercises at various facilities on LLNL site.
All	Documented training records exist for each individual.

### 6.8.3 Services Provided -- Training

ALCO Fire has multiple training policies and standards, which are generally included in the 50.000 series of Official Action Guides (OAGs). As part of the ALCO Fire Recruit Academy, there is a minimum set of standards for entry level firefighter which includes two year probation. These standards are documented in the ALCO OAGs.

There are also standards for wildland firefighting, which are part of the “red card” program. It is reported that the training includes ICS 100, S-130 (Firefighter Training), S-190 (Introduction to Fire Wildland Behavior), L-180 (Potential Hazards and Human Factors on the Fire line) and S-131 (Advanced Firefighter Training). These are all part of the Recruit Academy. These standards are documented in the ALCO OAGs..

A recurring training program was established in 2006 to provide a minimum of 20 hours of refresher training and an assessment tool for all ALCO fire stations. A copy of OAG 50.009 and the 2011 and 2012 Training Plans were reviewed as evidence of a recurring training plan. The training plans are comprehensive with study guides, performance evaluations, and monthly training assignments.

Minimum qualifications for company officers include being a member of ALCO Fire for 5 years, completion of a Task Book for Captain, completion of Command 1, Instructor 1A from the State Fire Marshal’s Office, and completion of ICS 300. There is an Officer Academy and a 1-year probationary period.

There is a training program for hazardous materials and technical rescue training for those personnel in stations requiring that training. This training is documented in the ALCO OAGs.

Most of the ACFD training is done on LLNL property in the fire stations, in LLNL classroom facilities, or on LLNL roadways and parking lots. Certain evolutions require the use of a fire department drill grounds having a drill tower and/or structure fire building. ACFD uses both their own training center in San Leandro and has access to the Livermore-Pleasanton Fire Department Training Center in Pleasanton for those training evolutions.

Drills and exercises at LLNL facilities is an important part of the emergency management program. There are extensive drills and exercises of various types are

scheduled throughout the year by the Emergency Programs Division of the Emergency Management Department. During the past 3 years ACFD was involved in 19 Emergency Program’s drills or exercises. In addition, the Fire Marshal has conducted a select number of specialty drills, i.e.: response to High Voltage facilities. Special facility familiarization tours are conducted annually for all nuclear facilities and those tours are tracked in LTRAIN as Facility Briefings. Any special firefighting techniques for these facilities are discussed during the briefing.

ACFD Training is tracked for each individual via a computer program that is part of the ALCO records management system. A sample of individual training records was examined. Each record contained the module completed, number of hours, and date. The Training Office does certification tracking. LLNL site specific training is tracked in LTRAIN.

**6.8.4 Performance Status -- Training**

**Table 6.5.4 Performance Status Summary - Training**

<b>Personnel</b>	<b>Performance Measure</b>	<b>Performance Criterion Met or Not Met</b>
Entry level	Qualifications are established for entry-level fire department personnel that include medical and physical performance criteria.	Met
Entry level	There is an established training criterion for minimum performance of entry-level personnel.	Met
Incumbents	There is an established on-going training criterion for training for incumbents.	Met
Officers	Criteria established a minimum training for fire officers or supervisors of emergency responder.	Met
Special Operations	Criteria established a minimum training for special operations such as hazardous materials and technical rescue.	Met
Drills and Exercises	There is an established program of drills and exercises at various facilities on LLNL site.	Met
All	Documented training records exist for each individual.	Met

**6.8.5 Observations – Training**

None

**6.9 Pre-Fire Plans**

**6.9.1 Minimum Performance Requirements – Pre-Fire Plans**

*Provide pre-fire plans for all LLNL and Sandia/CA buildings meeting LLNL Procedure 310.00 with a quarterly review frequency to ensure that they are current and accurate.*

*Provide and maintain written standard operating procedures for emergency response to occupancies with hazardous materials or other unique hazards.*

**6.9.2 Performance Summary – Pre-Fire Plans**

**Table 6.8.2 Performance Summary – Pre-Fire Plans**

Performance Measure	Frequency
Provide pre-fire plans for all buildings	Quarterly
Provide written standard operating procedures for response to occupancies with hazardous materials or other unique hazards	Annually

**6.9.3 Services Provided – Pre-Fire Plans**

ACFD provides Pre-Fire Plans based on ACFD Policy, Policy 30-103 which was created to meet the LLNL Runcard needs.

LLNL runcards consist of hanging folders that contain building plans, alarm and sprinkler zone plans, exposure maps, an emergency call out list, and a Special Information Sheet. This provides a detailed description of the contents of the building, ways to approach it, and the layout of the building and alarm zones. The “run cards” are filed in building number order in a filing cabinet in the apparatus room. Mutual and automatic aid companies have been shown the location of the run cards in case they are responding to a building without one of the “resident” companies.

The Special Information Sheets and the Emergency Call Out Lists are maintained by the ES&H Teams and updated quarterly. Information is loaded onto a server and downloaded quarterly by the Emergency Management Department Secretary, who then passes it to the Battalion Chiefs for insertion into the Runcards.

Several audits over the past year have found areas for improvement of the run cards. Structural issues have been resolved, however timely updating of the Emergency Call Out lists is a continuing challenge. The most recent audit, conducted as part of an independent review of the Emergency Management Department by the F&I Directorate, “did not indicate the problems as identified in the [2009] BNA.”<sup>v</sup>



#### 6.9.4 Performance Status – Pre-Fire Plans

**Table 8.8.2 Performance Status Summary– Pre-Fire Plans**

Performance Measure	Frequency	Performance Criterion Met or Not Met
Provide pre-fire plans for all buildings	Quarterly	Met
Provide written standard operating procedures for response to occupancies with hazardous materials or other unique hazards	Annually	Met

#### 6.9.5 Observations – Pre-Fire Plans

1. Emergency Call Out Lists and Special Information Sheets could be improved by proper quarterly review by ACFD to insure quarterly updates are placed in the Runcards in a timely manner.

#### 6.10 Emergency Response Apparatus

##### 6.10.1 Minimum Performance Requirements – Emergency Apparatus

*Apparatus and equipment must meet NFPA Standards for design, minimum equipment, and maintenance.*

*Provide a written replacement schedule for all emergency apparatus to allow timely replacement.*

##### 6.10.2 Performance Summary – Emergency Apparatus

**Table 6.10.2 Performance Summary – Emergency Apparatus**

Type Apparatus	Number	Comment
Engine	3	Livermore Site – 2, S-300 – 1
Aerial Ladder		Available via Automatic Aid
Ambulance ALS Configuration	2	Livermore Site – 1, S-300 – 1
Type 3 Engine	2	Livermore Site – 1, S-300 – 1
Type 4 Engine	2	Livermore Site – 1, S-300 – 1
Hazardous Materials	1	Responds both sites
Command	1	Battalion Chief
Reserve Type 1 Engine	1	1 Reserve per 5 in front-line service
Reserve Ambulance	1	1 Reserve per 5 in front-line service
Reserve Type 3 Engine	1	1 Reserve per 5 in front-line service
Reserve Type 4 Engine	1	1 Reserve per 5 in front-line service

### 6.10.3 Services Provided – Emergency Apparatus

As part of the contract with ACFD, LLNL remains responsible for providing emergency apparatus and equipment. ACFD is responsible for replacement of expendables. The LLNL emergency apparatus fleet is modern, well designed, complying with NFPA standards and has been maintained per the GSA maintenance schedule. Recently, LLNL has close its own vehicle maintenance facility, leaving DOE owned vehicle maintenance up to the users. In response to this LLNL has contracted with the ACFD Maintenance Division for routine maintenance and is sending all vehicles to their facility for repairs by training Emergency Vehicle Technicians. The following table summarizes the LLNL emergency response fleet.

**Table 6.10.3 Current LLNL Fire Department Fleet**

Year	Chassis Make	Type and Kind	Station	Scheduled Replace	Comments Replacement Cost
2010	Ford	Ambulance	20	2020	
2004	Ford	Ambulance	20	2014	Reserve/Lease
2004	Ford	Ambulance	21	2014	Lease
2005	Pierce	Hazmat	20	2025	\$500K
1998	American LaFrance	Aerial Ladder	20	2018	\$950K
2000	American LaFrance	Type 1 Engine		2015	\$650K
2006	Pierce	Type I Engine	20	2026	\$650K
2007	Pierce	Type I Engine	20	2027	\$650K
2003	International	Type 3 Engine	20	2018	\$350K
2004	International	Type 3 Engine	21	2019	\$350K
2004	Ford	Type 4 Engine	20	2014	Lease
2004	Ford	Type 4 Engine	20	2014	Reserve/Lease
2005	Ford	Type 4 Engine	21	2015	Lease

The design of the fleet is such that the oldest engine is being used as the first line Type 1 Engine for Station 21 where the call volume is small. There is no reserve Type 1 engine. The need for two Type 3 Engines is based upon the prescribed burn of Site 300. From a fleet management standpoint, two Type 3 engines are sufficient with one being the reserve for the other. The type 4 engines are GSA lease vehicles with skid loaded firefighting modules. Their modest cost allows maintenance of both front line and reserve vehicles. ACFD has been able to provide coverage for an engine out of service due to repairs or maintenance, an advantage of contracting for service with a large regional agency, however, this service is not required by the contract and may be stopped at any time.

The need for a replacement aerial ladder is questionable. The limited need at LLNL can easily be met by units from mutual or automatic aid rather than continued purchase and maintenance of an LLNL owned unit. Now that the Livermore Pleasanton Fire Department has contracted with ACRECC for dispatch services, the dispatch of an aerial ladder via automatic aid can be done seamlessly, making that avenue for aerial

ladder service very attractive. This option will be explored prior to replacement of the existing ladder, which is expected to cost nearly \$1M.

The ambulance situation is very stable with Sandia providing what is essentially the reserve ambulance via a GSA lease. One of the ambulances was replaced in 2011 by purchase of a “remount” ambulance (a reconditioned ambulance module is remounted on a new vehicle chassis) when GSA could not provide a suitable leased vehicle.

There is a five-year apparatus replacement plan that is updated annually.

#### 6.10.4 Performance Status – Emergency Apparatus

**Table 6.7.4 Performance Status Required First Line & Reserve Apparatus**

Type Apparatus	Number	Comment	Criterion Met or Not Met
Engine	3	Livermore Site – 2, S-300 – 1	Met
Aerial Ladder	1	Livermore Site	Met
Ambulance	2	Livermore Site – 1, S-300 – 1	Met
Type 3 Engine	1	Livermore Site – 1, S-300 – 1	Met
Type 4 Engine	2	Livermore Site – 1, S-300 – 1	Met
Hazardous Materials	1	Responds both sites	Met
Command	1	Battalion Chief	Provided by ACFD
Reserve Type 1 Engine	1	1 Reserve per 5 in front-line service	Not Met
Reserve Ambulance	1	1 Reserve per 5 in front-line service	Met
Reserve Type 3 Engine	1	1 Reserve per 5 in front-line service	Met
Reserve Type 4 Engine	1	1 Reserve per 5 in front-line service	Met
Apparatus Plan		Written 5 year Plan	Met
Apparatus Maintenance		Per NFPA and GSA Fleet Requirements	Met

#### 6.10.5 Observations – Emergency Apparatus

1. Internally, LLNL should resolve the philosophy under which it will operate the emergency vehicle fleet. Is the use of ACFD reserve apparatus an acceptable risk?

<sup>i</sup> Lawrence Livermore National Laboratory, *Prescribed Burning/Smoke Management Plan*, UCRL-AR-154173-REV-9, March 2012.

<sup>ii</sup> Lawrence Livermore National Laboratory, Site 300 Explosive Test Facility *Prescribed Burn/Smoke Management Plan*, UCRL-AR-154174-REV-9, March 2012.

<sup>iii</sup> Alameda County Fire Department, *Controlled Burns at Site 300 Procedure*, March 2008.

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<sup>iv</sup> National Fire Protection Association, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, NFPA 1221, Quincy, MA: 2013.

<sup>v</sup> Armstrong, Dennis, Emergency Management Department Program Review, Pg.18, November 30, 2012.