



**LATA Environmental Services
of Kentucky, LLC**

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July 18, 2011

PAD-ENG-11-1381

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U.S. Department of Energy
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KC
JUL 18 3:48 PM

Dear Mr. Knerr:

DE-AC30-10CC40020: *Emergency Services Baseline Needs Assessment LATA Environmental Services of Kentucky, LLC, LATA-2011-0010*

Please find enclosed the *Emergency Services Baseline Needs Assessment LATA Environmental Services of Kentucky, LLC, LATA-2011-0010*.

If you have any questions, please contact Randy Scott at (270) 441-5162.

Sincerely,

LATA Environmental Services of Kentucky, LLC

Mark J. Duff
Paducah Project Manager

Enclosure

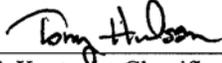
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**Emergency Services
Baseline Needs Assessment
LATA Environmental Services of Kentucky, LLC**



This document is approved for public release per review by:



LATA Kentucky Classification Support

7-13-11
Date

LATA-2011-0010

**Emergency Services
Baseline Needs Assessment
LATA Environmental Services of Kentucky, LLC**

Issued—July 2011

Prepared by
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Baltimore, MD
Under professional services agreement LKY-0000942

Prepared for
LATA ENVIRONMENTAL SERVICES OF KENTUCKY, LLC
managing the
Environmental Remediation Activities at the
Paducah Gaseous Diffusion Plant
under contract DE-AC30-10CC40020

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CHANGE LOG

Revision Number	Interim Change No.	Effective Date	Description of Change
0		July 2011	Initial Issue

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ACRONYMS

ACLS	advanced cardiac life support
AED	automated external defibrillator
AHJ	authority having jurisdiction
ALS	advanced life support
BLS	basic life support
BNA	Baseline Needs Assessment
<i>CFR</i>	<i>Code of Federal Regulations</i>
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EMS	emergency medical service
EMT	emergency medical technician
ES&H	Environment, Safety, and Health
E-squad	emergency squad
FD	fire department
HAZMAT	hazardous materials
HF	hydrogen fluoride
HPR	highly protected risk
ISMS	Integrated Safety Management System
ITM	inspection, testing, and maintenance
<i>KAR</i>	<i>Kentucky Administrative Regulation</i>
LATA Kentucky	LATA Environmental Services of Kentucky, LLC
MgF ₂	magnesium fluoride
NFPA	National Fire Protection Association
PPPO	Portsmouth/Paducah Project Office
PSS	plant shift superintendent
SOP	standard operating procedure
USEC	United States Enrichment Corporation
WA	work authorization

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EXECUTIVE SUMMARY

In accordance with the requirements of U.S. Department of Energy (DOE) Order 420.1B, *Facility Safety*, and as elaborated in DOE G 420.1-3, *Implementation Guide for DOE Fire Protection and Emergency Services Programs*, a Baseline Needs Assessment (BNA) was conducted for LATA Environmental Services of Kentucky, LLC (LATA Kentucky). The BNA site work was completed during the week of January 10, 2011. The assessment was conducted by Bruce Campbell, FSFPE, and Robert Wheeler, P.E., (see Appendix A) with input provided by representatives from LATA Kentucky and United States Enrichment Corporation (USEC).

The BNA involved a range of activities, including document and record reviews; interviews with knowledgeable and responsible personnel from LATA Kentucky, USEC, and Mercy Regional Emergency Medical Service (EMS); and site tours (including external tours of all major buildings and outdoor facilities associated with LATA Kentucky). A limited scope USEC site visit was included in this effort to evaluate fire department capabilities, including mobile apparatus, emergency response equipment, procedures, preplans, and training. Only those elements of USEC documentation that are integrated into those of LATA Kentucky (e.g., USEC prefire plans, as appended to LATA Kentucky plans) were included in the scope of this review. Representatives from the USEC emergency response staff provided technical support and were interviewed to obtain their perspective on fire-safety-related conditions associated with LATA Kentucky that are relevant to emergency services.

The assessment confirmed that the USEC industrial fire department generally is capable of providing certain emergency and nonemergency services in a timely and effective manner to LATA Kentucky, except as noted within this BNA.

LATA Kentucky is providing a range of supplementary capabilities (e.g., information, physical fire safety features) that, in general, enhance the ability of the USEC fire department to respond effectively to credible site emergencies. Facilities at LATA Kentucky manifest fire protection defense-in-depth, consistent with the requirements for highly protected risks (HPRs) from the referenced DOE criteria. Work activities that impact fire safety are being conducted under the principles and practices of the Integrated Safety Management System.

Seven opportunities for improvement were identified by this BNA:

- (1) OI-BNA-2011-1—USEC fire department's use of nebulizers.
- (2) OI-BNA-2011-2—Hydrogen fluoride (HF) familiarization training for the Mercy Regional EMS.
- (3) OI-BNA-2011-3—The minimum staffing number for the fire department should be increased from three to four.
- (4) OI-BNA-2011-4—The outdated manual sampling gas detection tubes should be replaced with automatic air sampling gas detectors capable of continuously sampling for the presence of HF.
- (5) OI-BNA-2011-5—To ensure an adequate supply of Level A suits, a source of suits should be identified that can be made available on quick notice during an emergency. A contractual arrangement should be put in place to permit procurement of these suits in a timely manner.

- (6) OI-BNA-2011-6—The Environment, Safety, and Health (ES&H) organization should sponsor a productivity improvement group to evaluate the hot work program to ensure the program has sufficient rigor, but is not too rigorous to potentially encourage personnel to bypass the system.
- (7) OI-BNA-2011-7—The decontamination and decommissioning (D&D) organization should initiate a regular forum with the USEC fire department to keep them up-to-date on LATA Kentucky's D&D project. It is suggested that this forum meet monthly. The forum can consist of representatives from LATA Kentucky meeting with the fire department officers at the fire station to provide them with a briefing on any changes to the facilities to a weekly drive-by with LATA Kentucky and USEC representatives.

Three Findings were identified by this BNA:

- (1) F-BNA-2011-1—A new work authorization that completely defines contractual obligations for emergency and nonemergency services from USEC to the LATA Kentucky facilities should be established.
- (2) F-BNA-2011-2—USEC should dispatch a Mercy Regional EMS advanced life support unit immediately for any HF emergency response at LATA Kentucky (i.e., spills of more than 5 gal or any spill involving personnel exposure/injury).
- (3) F-BNA-2011-3—USEC and LATA Kentucky should coordinate and preplan for a high angle rescue. The existing fire preplans (e.g., C-340 and C-410) should be revised to reflect this type of rescue. Necessary modifications to the structures identified during the review should be implemented by LATA Kentucky.

Details on all of the above are provided in the BNA.

1. INTRODUCTION

Chapter II, Paragraph 3. b. (8) of U.S. Department of Energy (DOE) Order 420.1B requires of each DOE site “a Baseline Needs Assessment (BNA) of the fire protection emergency response organization.” Both the Order and its implementation guide (DOE G 420.1-3) stipulate that the BNA address a number of factors related to the adequacy of emergency services. This includes compliance with National Fire Protection Association (NFPA) codes and standards, among other considerations.

DOE BNAs are performed where DOE sites are protected by on-site professional fire departments (FDs). Paragraph 4.1.1.b of G 420.1-3, however, establishes the expectation that a BNA be conducted by contractors at a site [such as the LATA Environmental Services of Kentucky, LLC, (LATA Kentucky) portions at Paducah] that is served by an off-site emergency response organization (i.e., not part of the LATA Kentucky organization). This BNA was initiated to satisfy the above-referenced DOE fire safety criteria.

Unlike the DOE model, this BNA is a “hybrid” in that it addresses a location that relies primarily on the United States Enrichment Corporation (USEC) FD, the capabilities of which are supplemented by a number of practices, personnel, information, and fire safety features that are available from the LATA Kentucky organization.

2. GOALS

The BNA fulfills the following objectives:

- Quantifies needs for LATA Kentucky and USEC personnel staffing levels, physical assets, resource allocation, and deployment.
- Provides an analysis and planning tool to support management decision making for issues effecting emergency services and response for the LATA Kentucky facilities.
- Attains a justifiable balance between identified standards and performance-based task analysis.
- Evaluates compliance to applicable regulations (10 *CFR* Part 851 and 29 *CFR* Part 1910), DOE fire safety criteria (DOE O 420.1B and DOE G 420.1-3), industry standards (NFPA), and guidelines. (This will be through literal compliance with these provisions or through the application of equivalent methods, as permitted by both DOE and NFPA.)

3. METHODOLOGY

This BNA is requirements based in that it is predicated on the need to address explicit individual requirements from 10 *CFR* Part 851, 29 *CFR* Part 1910, as well as DOE O 420.1B. It also reflects the application of the criteria contained in NFPA codes and standards (1500, 1710, and others). It also conforms to the guidelines contained in DOE G 420.1-3 and the DOE Model BNA. In taking this approach, the BNA answers these questions:

- (1) What is required in the form of an emergency services capability?
- (2) What capabilities does USEC have to address this requirement?
- (3) What capabilities does LATA Kentucky have to address/facilitate meeting this requirement?
- (4) Is the USEC capability adequate?
- (5) What is the justification for the response to the previous question?
- (6) Is the LATA Kentucky emergency response capability (if any) adequate?
- (7) What is the justification for the response to the previous question?
- (8) What can be done to address inadequacies and improve the capability of the local FD and/or the site capability?
- (9) Opportunities for improvement will be highlighted apart from the narrative.

Although requirements based, the BNA includes a qualitative evaluation of credible “threats” to the site from representative fires, medical emergencies, hazardous material (HAZMAT) incidents, rescue situations, and others. The nature of these postulated threats was determined in consultation with the representative stakeholders. Conclusions regarding the adequacy (or inadequacy) of emergency services capabilities in relation to those threats considered both the on-site and off-site emergency response assets.

Where the emergency response capabilities of either LATA Kentucky and/or USEC were deemed insufficient, recommendations were formulated that offer alternative (yet equivalent) solutions to achieve literal conformance with the governing criteria.

NOTE: NFPA 1201, *Standard for Providing Emergency Services to the Public*, Section 4.3.2, stipulates that the level of service provided and the degree of risk accepted by the jurisdiction shall be subject to local determination.

NFPA 1710, Section 1.3, allows for the use of systems, methods, or approaches of equivalent or superior performance to those prescribed, provided that technical documentation is submitted to the authority having jurisdiction (AHJ) to demonstrate equivalency. For the LATA Kentucky facilities, the AHJ is the DOE Portsmouth/Paducah Project Office (PPPO). This BNA identifies alternative measures to the base requirements of NFPA 1710 and associated technical documentation that afford an acceptable level of emergency response service.

A number of representative documents were reviewed (see list in Appendix B). A cross section of individuals with knowledge of and responsibilities for emergency response for the LATA Kentucky facilities was interviewed (see list in Appendix B). All buildings (exterior tour only) and outdoor LATA Kentucky facilities on-site were toured and evaluated. USEC FD facilities, apparatus, and equipment were evaluated on the basis of the Safety Analysis Report, Nuclear Regulatory Commission Safety Evaluation Report, and information provided by the USEC manager of fire services and emergency management.

4. LATA KENTUCKY FIRE PROTECTION PROFILE

The LATA Kentucky fire protection program reflects both defense-in-depth and the application of highly protected risk (HPR) principles and practices, as required by DOE O 420.1B and as interpreted in the *DOE Fire Protection and Emergency Services Program Implementation Guide* (DOE G 420.1-3). This includes passive fire protection in the form of fire-rated building assemblies (floors, walls, and roofs) and interior exit stairways, among other structural features. Where rated fire assemblies are penetrated, the openings are protected by fire-rated doors, dampers, and penetration seals.

Active fire safety features include protection by individually complete automatic (fire) sprinkler systems. The water supply for fire suppression is supplied from the gaseous diffusion plant sanitary water distribution system. Supplementing the fire suppression systems, certain LATA Kentucky structures are provided with fire alarm systems, including fire/smoke detection in select areas and exhaust ventilation systems.

NOTE: Not all LATA Kentucky facilities are protected with automatic sprinklers.

Additional emergency response capabilities for LATA Kentucky include manual firefighting equipment, emergency response, and hazardous materials spill capabilities. The LATA Kentucky fire protection program includes combustible materials and ignition source control programs, and other (fire safety features) configuration control activities, such as fire protection self-assessments, among other activities. At the time of this BNA, the self-assessment program has not been implemented fully.

The core principles of the Integrated Safety Management System (ISMS) are manifested in the LATA Kentucky fire protection program. ISMS practices are applied across the spectrum of activities encompassed by the program, most notably in the conduct of all significant work. Specifically, the nature of the work is defined and documented, and appropriate safeguards are identified and implemented. Activities periodically are monitored by the LATA Kentucky safety staff and other responsible personnel. Feedback is provided by LATA Kentucky safety professionals, among others, and improvements (where necessary) are implemented and maintained.

5. RESULTS

5.1 WORK AUTHORIZATION 25973, PADUCAH FIRE, EMERGENCY, AND PLANT SHIFT SUPERINTENDENT

The contractually defining document for the provision of emergency and nonemergency services from USEC through DOE to LATA Kentucky is work authorization (WA) 25973. Currently, it is being sustained through a series of limited-time-duration modifications, although a new WA is pending. It addresses emergency management and preparedness in a seemingly comprehensive manner based on a review performed during this BNA.

With regard to fire protection and emergency response, the WA delineates a limited number of expectations. These include both general and specific emergency response related responsibilities and a series of fire protection program related duties. These detailed expectations generally are clear and concise; however, it does not identify an obligation to satisfy governing emergency response criteria such as 10 *CFR* Part 851, 29 *CFR* Part 1910, DOE O 420.1B and its implementation guide, or NFPA standards. Contrary to DOE criteria contained in DOE G 420.1-3, it does not specify a level of care for

emergency medical services. The WA does not delineate specific minimum staffing levels for response to expected emergencies, although the following requirement is specified, “Maintain the existing level of fire protection...including 24 hour/day fire and emergency services coverage.” It does not address the issue of mobile apparatus and emergency response equipment age-related replacement and obsolescence. The WA does not require the FD to perform a self-assessment against established DOE and NFPA emergency response criteria. Based on these considerations, it would be difficult to assure that over time an adequate level of emergency services will be provided consistently to LATA Kentucky by USEC.

Finding F-BNA-2011-1: A new WA that completely defines contractual obligations for emergency and nonemergency services from USEC to LATA Kentucky should be established. The current WA (Modification 29) does not define staffing level or level of care requirements.

5.2 EMERGENCY MEDICAL SERVICES

- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive...emergency response program...This includes...access to a fully staffed, trained and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”
- Chapter II, Paragraph 3. b. (7), of DOE O 420.1B requires DOE sites to have “access to qualified, trained...fire fighting personnel to implement the requirements of this Order.”
- Section 5.3 of NFPA 1710 establishes minimum capabilities for emergency medical services.
- Section 4.1 of DOE G 420.1-3 provides guidance regarding the provision of adequate emergency services. This guidance directs that a BNA consider only one medical emergency at a time.

Section 4.1 of DOE G 420.1-3 establishes the responsibility of the DOE AHJ to define for USEC the level of emergency medical care expected: advanced cardiac life support (ACLS), advanced life support (ALS), or basic life support (BLS). The current WA is silent on this subject. Currently, BLS is provided by USEC with limited ALS provided from the on-site medical department that generally has three personnel available during day shift times and the off-site response from Mercy Regional Medical Emergency Service (EMS), as necessary. Mercy is capable of responding to LATA Kentucky locations within approximately 15 minutes, which is not compliant with the requirements in NFPA 1710, Section 5.3.3.3.3 that requires a 480-second (8-minute) travel time to 90% of the incidents, provided a fire responder with automated external defibrillator (AED) or BLS unit arrived in 240 seconds (4 minutes) or less travel time.

The state of Kentucky may add a new category of emergency medical technicians (EMTs) within the next year or so. EMT-I may become a new level of EMT who will be trained and certified to infuse drugs via an intravenous injection. Per the USEC fire chief, if this category is implemented, he likely will pursue it for his department.

A critical emergency response capability is immediate treatment of a gaseous HF injury. The first and foremost treatment is decontamination of the victim’s wound area with an initial application of calcium gluconate (generally a gel) by the initial response team. Secondary treatments, if required, include the use of a calcium gluconate nebulizer, calcium gluconate injections, and calcium gluconate IV drips. Normally, the use of calcium gluconate injections is performed in the emergency room.

The initial application of calcium gluconate is considered a BLS function; the secondary treatments, such as the calcium gluconate injections and calcium gluconate IV drips, are ALS functions. Typically, calcium gluconate nebulizers are considered an ALS function; however, based on conversations that the USEC physician has had with the state of Kentucky, the USEC BLS EMTs can provide this treatment, under the direction of the USEC medical authority and based on the training they receive.

In discussions with USEC medical personnel and Mercy medical personnel, existing emergency actions available to LATA Kentucky personnel are as follows:

- Emergency HF kits are available at USEC medical; these kits include calcium gluconate that can be mixed into a gel, IV solution, or used as an injectable solution. These kits have a two-year shelf life. LATA Kentucky does not have HF spill kits available, which is acceptable based on the limited amount of gaseous HF associated with their decontamination and decommissioning (D&D) facilities.
- Per the USEC fire chief, USEC EMTs have been trained in the use of calcium gluconate nebulizers.
- Mercy currently has a single HF kit available for response to LATA Kentucky; the kit is located in the pharmacy and is not on a response vehicle. This kit is equipped with the following:
 - Five 5-cc syringes,
 - Five adult nebulizers,
 - Ten emesis basins,
 - Twelve 4.5-oz tubes surgical lubricant, and
 - Twenty-five 50 ml calcium gluconate.
- Currently, Mercy is not dispatched immediately on an HF emergency.

In an HF emergency involving injury, it is expected that the time required to move the patient away from the hazard to a noncontaminated area (i.e., cold zone) to initiate decontamination and treatment will exceed the response time for Mercy to reach LATA Kentucky locations (approximately 15 minutes). To ensure ALS treatment is initiated as rapidly as possible, Mercy should be dispatched immediately on LATA Kentucky HF emergencies (i.e., spills or any spill involving personnel exposure/injury).

Opportunity for Improvement—OI-BNA-2011-1: USEC EMTs have been trained on the utilization of calcium gluconate nebulizers, and the nebulizers should be located/stocked on all EMS vehicles.

Opportunity for Improvement—OI-BNA-2011-2: USEC should provide Mercy with HF awareness training. The training should be equivalent to or in greater detail than what is provided to LATA Kentucky employees. Training should be provided at the Mercy training room for all shifts. The training should be repeated at least annually.

Finding F-BNA-2011-2: USEC should dispatch a Mercy ALS unit immediately for any HF emergency response at LATA Kentucky (i.e., spills or any spill involving personnel exposure/injury). In addition, a tiered ALS response for any incident involving multiple HF casualties should be available. This required dispatch protocol should be included in the WA agreement. LATA Kentucky should investigate a letter of agreement on these dispatches.

The USEC medical department has indicated that this level of care has been effective and the need for ALS service by USEC is not warranted. This BNA, based on the medical department's input and interviews concurs with this position, provided that a Mercy ALS unit is dispatched immediately on HF incidents at LATA Kentucky (i.e., spills or any spill involving personnel exposure/injury). Mercy ALS

units are or will be equipped with HF kits, USEC EMTs are or will be trained and have immediate access to calcium gluconate nebulizers, and a written agreement for immediate Mercy ALS and tiered response is present.

The local community ambulance service, Mercy Regional EMS (<http://mercyregionalems.com/>), is capable of providing ACLS level of care if needed. This is based on interviews with their representatives, including their medical director (for this BNA the medical director was not available; however, during the interview with the Mercy officer during this BNA, past information was reverified). A letter of assistance is in place between Mercy, the provider of ALS service, and USEC.

USEC provides BLS ambulance service on-site. A Class IV service operating a BLS ambulance requires two trained personnel: a driver certified as a first responder and an attendant certified as an EMT. USEC firefighters are certified as EMT-basic.

A Class IV service operating an ALS ambulance requires two trained personnel: a driver certified as a first responder and an attendant licensed as a paramedic.

Based on DOE and NFPA criteria and precedence, this capability must be available to deal with a casualty upon arrival at the scene of an emergency.

Section 5.3.3 of NFPA 1710 establishes time parameters (240-seconds for BLS) for this level of care along with an allowance for isolated instances when on-time arrival cannot be achieved consistently. The USEC FD has the capability (ambulances, equipment, and trained EMTs) to provide a timely BLS level of EMS to LATA. The USEC fire station is located within the fenced area where the majority of the LATA Kentucky facilities are located. Thus, access to the LATA Kentucky facilities is not affected by the security fence. If necessary, the security gates are opened by USEC security personnel, permitting the responding personnel to quickly respond outside of the gate.

USEC's remaining capabilities to provide EMS were compared against the requirements delineated in Section 5.3.3 of NFPA 1710 and appear to be satisfactory.

5.3 MANUAL FIRE SUPPRESSION

5.3.1 USEC Fire Suppression Capabilities

- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive...emergency response program...This includes...access to a fully staffed, trained and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”
- Chapter II, Paragraph 3. b. (7), of DOE O 420.1B requires DOE sites to have “access to qualified, trained...fire fighting personnel to implement the requirements of this Order.”
- Section 5.2 of NFPA 1710 establishes minimum capabilities for fire suppression services, including staffing and (number of) operating units.
- Section 4.1 of DOE G 420.1-3 provides guidance regarding the provision of adequate emergency services, including a discussion on the useful life of fire apparatus.

- The Technical Safety Requirements (TSR) for building C-410 requires a fire protection program in Section 5.5.2.6 and an FD response in Section 5.5.2.6.b.iii
- The TSR for building C-746-Q requires a fire protection program in Section 5.5.2.6 and an FD response in Section 5.5.2.6.b.iii

The USEC FD alarm assignment (for structural fires) consists of the following apparatus:

- One 1987 1,500 gpm pumper with a 500 gal capacity water storage tank
- One 1982 100 ft aerial truck with a 1,500 gpm pump and a 250 gal water storage tank
- One 1991 HAZMAT unit
- One 1997 ambulance
- One 2010 equipment truck

Supplemental and “reserve” apparatus consists of the following:

- One 2005 wildland unit
- One HAZMAT cart
- One 1990 ambulance
- One 2010 four-wheel drive pick-up truck

This fleet of mobile apparatus was evaluated against the fire hazards and credible fire scenarios that are described in the various LATA Kentucky Fire Hazard Analyses and related documents and appear to be satisfactory. The apparatus will be sufficient to provide the (water) pumping capability, EMS ambulatory capability, and command vehicle for all credible fires and related events, with a single casualty, per DOE criteria.

The inventory of emergency response equipment on these vehicles was assessed as part of this review. The amount and nature of this equipment conforms to both NFPA standards and reflects USEC-related determinations of needs. The two USEC pumpers are over 20 years old and receive the required annual maintenance to ensure they are in proper working order. The USEC fire chief monitors the condition of this apparatus and will submit a budget request when the apparatus is no longer in a viable or economical condition for sustained service.

The USEC fire chief has made a capital budget request (non-General Services Administration procurement) for a new ambulance for 2011; however, this request has not been approved yet. If it is not funded for 2011, the fire chief will resubmit for 2012.

Emergency response staffing needs for the LATA Kentucky facilities were evaluated on the basis of explicit criteria; judgment, experience, and DOE precedent. In determining the required numbers of trained firefighters, there are two critical DOE positions that govern staffing for fire fighting. These positions are delineated in Section 4.9 of DOE G 420.1-3:

- (1) A minimum of five trained firefighters must be present on scene before active firefighting operations.
- (2) Sufficient staff must be available for only one emergency incident (such as a fire) concurrent with a casualty requiring medical assistance.

For this BNA and consistent with DOE precedent and current practice, fire response staffing also was considered in conjunction with the criteria delineated in Section 5.2 of NFPA 1710. This approach conforms to the DOE “model” BNA. Several criteria are critical, such as these:

- 5.2.2 Operating Units. Fire company staffing requirements shall be based on minimum levels for emergency operations for safety, effectiveness, and efficiency.
- 5.2.2.1.1 These companies shall be staffed with a minimum of four on-duty personnel.
- 5.2.2.1.2 In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors, as identified by the AHJ, these companies shall be staffed with a minimum of five or six on-duty members.
- 4.1.2.1.1 The FD shall establish the following time objectives:
 - Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident, and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident.

It is recognized that the above-referenced time parameters must be met only 90% of the time and that DOE allows delayed response to fire when facilities are completely protected by fire suppression systems.

According to established emergency response procedures, upon initial receipt of a fire alarm from the LATA Kentucky facilities, USEC will dispatch the following personnel as identified in Table 1.

Table 1. USEC Responders to LATA Kentucky Fires

Response Personnel	Minimum Staffing Level	Required Response Level
Firefighters	3	4*
Fire Department Shift Commander (Major)	1	1
Plant Shift Superintendent Incident Commander	1	1
Safety Officer [an Emergency Squad (E-Squad) Supervisor]	1	1
E-Squad Personnel, (hourly)	6	15
Health Physics Technician(s)	1	2
TOTAL	12**	22**

* As required by NFPA 1710 and DOE

** The health physics technicians are not included in the total since they typically are not included in the evaluation for the actual firefighting response.

Minimum staffing requirements for a Class IV service operating a BLS ambulance are defined in 202 KAR 7:501 as a driver certified as a first responder and an attendant certified as an EMT. Current USEC protocols and procedures require that the driver be a certified EMT and two certified EMT attendants for a cardiac emergency. Although these levels exceed the minimum state requirements, use of two EMT attendants is required during cardiac or similar types of responses where procedures such as CPR would be needed.

Considering this response, a fire that involves a significant medical emergency will result in at least two and possibly three (e.g., a cardiac emergency) of the five USEC firefighters/EMTs being required to deal with the medical condition (three firefighters, one shift commander, and one safety officer). While it was noted that a community ambulance and an EMS exist, it is not capable of responding to the site within the time parameters established by NFPA 1710 (480 seconds) for ALS response. Based on interviews

conducted as part of this BNA, local support personnel would be available anywhere from 7 to 15 minutes to provide needed medical care. Upon arrival on the scene, immediate medical care will be provided by USEC emergency responders. This leaves at most one and possibly no firefighters to perform a range of fire ground operations. USEC will not permit entry into a burning structure without at least four trained emergency responders present. This is consistent with the Occupational Safety and Health Administration's "two-in, two-out rule." Supplementing the USEC FD with the auxiliary emergency squad (E-squad) members will provide an adequate complement of trained emergency responders.

E-squad members are not trained on the operation of the fire engine's pump, thus, if two or three of USEC's firefighters are working the EMS portion of the LATA Kentucky emergency, only the officer may remain to direct the firefighting efforts with no personnel to operate the fire engine pump.

The E-squad personnel are trained for interior firefighting; however, their training is not tracked by the State of Kentucky, nor are they certified to Firefighter I. E-squad members receive the following training that is tracked/documentated by USEC:

- 40 hours of initial training
- Two hours per month
- Eight hours per year of HAZMAT training
- Eight hours per year via the annual burn training

Although the E-squad training is adequate to provide ground operational support, they generally do not have adequate real-life experience (unless they are volunteer firefighters on the outside) that is needed to lead an interior firefighting attack without the direction of a uniformed firefighter.

Similarly, if the USEC FD is on an emergency EMS call at the time of an incident at LATA Kentucky, there is the potential that only one firefighter is available. As stated earlier, simultaneous responses generally are not evaluated in DOE BNAs; however, since the response capabilities are significantly impacted during an EMS run, this BNA is evaluating the effects of an EMS run at the time of a LATA Kentucky emergency response.

Considering the minimum staffing level of four (three firefighters and one officer) of the USEC FD and the effects to their response capabilities during an EMS event, additional minimum staffing should be considered.

Opportunity for Improvement—OI-BNA-2011-3: The minimum staffing of the USEC FD should be increased from three to four.

The basis for the recommendation for additional firefighters (from 3 to 4) is to provide one firefighter for operation of the fire truck pump and one to be the lead (on the nozzle) on the charged hose line for interior firefighting. The nozzle person then will be supplemented by E-squad personnel.

Note that paragraph 5.2.4.2.2 of NFPA 1710 delineates the need for two additional firefighters for search and rescue operations and two more firefighters for ground ladder operations. The USEC auxiliary E-squad members also are trained as interior firefighters and would be able to assist with internal firefighting evolutions. This was confirmed during interviews during this BNA. The USEC emergency response staffing noted above would be able to accommodate search and rescue and ground ladder operations; the need for ground ladder operations for LATA Kentucky is considered possible as there are several buildings over two-stories (e.g. C-340 and C-410). The proposed staffing levels of four firefighters and one officer with support from six E-squad members will meet the response requirements for both the Initial Arriving Company and the Initial Full Alarm Assignment Capability. The proposed

staffing level will maintain a state certified firefighter to run the pumper and provide lead on ground fire attacks with the following breakdown of personnel:

- EMS Crew—Two firefighters
- First Handline—One firefighter and one E-squad
- Handline Support Personnel—One E-squad member
- Search and Rescue Team/Second Handline—One firefighter and one E-squad member
- Pumper Truck Operator—firefighter
- Back-up/IRIC-Dedicated—Two E-squad members

It is acknowledged that the minimum staffing level of four USEC firefighters would be the normal expected level of response; however, the minimum level is not defined in the current WA.

Mutual aid agreements are in place with the Lone Oak FD and the Paducah FD. A Letter of Agreement is in place with the West McCracken Fire District. However, no credit was taken for them as part of this BNA report. This is consistent with the DOE “model” BNA and past precedent.

Per DOE emergency services guidance, consideration was given to the possibility of a fire occurring at a LATA Kentucky facility while the USEC FD is responding to another emergency on-site (e.g., at the Babcock & Wilcox Conversion Services, LLC facility, or at another LATA Kentucky or USEC facility). Under this scenario, additional personnel are being recommended (see above) and reliance also is placed on backfill personnel and reserve apparatus. The number of personnel and apparatus would be comparable to that noted above, but the response time would be of a longer indeterminate duration. This potential scenario is not considered significant from a probabilistic standpoint and recognition of the existing level of fire protection at the LATA Kentucky facilities, as noted above. Paragraph 4.9.5 of DOE G 420.1-3 accepts delayed response to structural fires in consideration of significant levels of fixed fire protection within facilities.

During the interviews that were conducted with USEC FD concerning the response to fires, it was noted that means to isolate all electrical equipment is documented within the fire preplans. Additionally the D&D facilities have their electrical feeds isolated as part of the D&D efforts.

5.3.2 LATA Kentucky (Site) Fire Suppression Capabilities

- Chapter II, Paragraph 3. c. (1), of DOE O 420.1B requires DOE sites to have “a reliable and adequate supply of water for fire suppression.”
- Chapter II, Paragraph 3. c. (9), of DOE O 420.1B requires DOE sites to have “physical access and appropriate equipment that is accessible for effective fire department intervention.”
- Paragraph 6.2 of DOE-STD-1066-99, *Fire Protection Design Criteria*, requires that “all water distribution systems should be of the looped grid type, providing two way flows.” The system is required to be in conformance to NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.
- Paragraph 8.1 of DOE-STD-1066-99, *Fire Protection Design Criteria*, requires the “transmission of (fire alarm) signals to the responding DOE facility fire alarm center and other constantly attended locations in accordance with NFPA 72.”

The LATA Kentucky (fire) water distribution system consists of a looped underground main supplied from the USEC Sanitary Water System. This system complies with the Kentucky Fire Code, DOE-STD-

1066-99, and applicable NFPA Standards. It is tested and maintained in accordance with both DOE and industry requirements and is, therefore, considered acceptable. The automatic sprinkler systems at LATA Kentucky were designed and calculated to include a 1 psi safety margin per DOE guidance. As discussed earlier, the D&D facilities have had their automatic sprinkler systems isolated. The systems were isolated prior to LATA Kentucky's contract with the DOE.

Fire alarm signals (including sprinkler system water flow alarms) are transmitted to the USEC FD alarm center. The alarm center is considered outside the scope of the BNA report.

5.4 HAZARDOUS MATERIALS RESPONSE

- Section 1910.120 (a) of 29 *CFR* Part 1910 requires an emergency response capability for hazardous material incidents.
- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive...emergency response program...This includes...access to a fully staffed, trained and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”
- Chapter II, Paragraph 3. b. (7), of DOE O 420.1B requires DOE sites to have “access to qualified, trained...fire fighting personnel to implement the requirements of this Order.”
- Section 5.4 of NFPA 1710 establishes minimum capabilities for a special operations response.
- Section 4.1 of DOE G 420.1-3 provides guidance regarding the provision of adequate emergency services.

The above-referenced 29 *CFR* citation includes requirements for HAZMAT response that are oriented toward specific response functions at the scene of a HAZMAT release. They include the following:

- One Incident Commander
- Four HAZMAT Technicians
- One Qualified Basic Life Support Personnel
- One Safety Officer

Upon notification from LATA Kentucky of a HAZMAT incident, USEC will dispatch trained (to 29 *CFR* Part 1910 for technician level) personnel as identified in Table 2.

Table 2. USEC Responders to a LATA Kentucky HAZMAT Incident

Response Personnel	Minimum Staffing Level	Required Response Level
Firefighters	3	4*
FD Shift Commander (Major)	1	1
PSS Incident Commander	1	1
Safety Officer (an E-squad Supervisor)	1	1
E-squad Personnel (hourly)	6	15
Health Physics Technician(s)	1	2
LATA Kentucky HAZMAT Technicians	3	3
TOTAL	12 to 15**	22 to 25**

* As required by NFPA 1710 and DOE

** The health physics technicians are not included in the total since they typically are not included in the evaluation of a hazardous materials response. A range is utilized since the LATA Kentucky HAZMAT personnel are not fully formalized at this time.

In addition to the USEC HAZMAT-trained responders, additional LATA Kentucky D&D personnel may be responding to and may support effluent control and recovery operations until termination of the incident. If LATA Kentucky personnel are involved, they will be strictly under the direction of the USEC incident commander. This ad hoc response is not credited in the above.

In general, the USEC equipment necessary for a hazardous material response to an HF incident is appropriate and in good working order. Chemical resistant suits are available to create entry teams and decontamination teams. Based on a recent event, the number of USEC and LATA Kentucky Level A suits may not be sufficient. The USEC FD has an inventory of 11 to 12 Level A suits. LATA Kentucky keeps 12 Level A suits in a temperature controlled warehouse for use by the FD in the event of a LATA Kentucky emergency. During the recent hazardous materials event (one-week prior to the LATA Kentucky transition), the entire inventory was depleted. The LATA Kentucky suits are maintained in accordance with manufacturer’s requirements; however, they are not tested on a yearly basis, as required. In discussions with the fire chief, it was stated that in the event of an emergency, if the suits were needed, they would be tested prior to use regardless of whether LATA Kentucky had tested them to ensure that they are fully safe and operable.

Currently, to sample for the presence of HF vapors in an emergency, the USEC FD uses Drager tubes to manually pull air samples during an emergency. While this technology will accomplish the task, it is considered outdated for emergency responders. The Drager tubes should be replaced with an automatic air sampling detector that can sample for hazardous gasses continuously.

Building C-340 currently is undergoing D&D and previously had magnesium fluoride (MgF₂), as an internal hazard, and it was removed recently during D&D. According to the Material Safety Data Sheet for this material, it has a high health hazard exposure. Since this material may be involved in an emergency response (if some of the material was missed or in an unexpected location), the appropriate response protocols should be documented within the fire preplan.

Opportunity for Improvement—OI-BNA-2011-4: To improve the timeliness of HAZMAT emergency response, the outdated manual sampling gas detection tubes currently in use by the USEC FD should be replaced with automatic air sampling gas detectors capable of continuously sampling for the presence of HF.

Opportunity for Improvement—OI-BNA-2011-5: To ensure an adequate supply of Level A suits, a source of suits should be identified that can be made available on quick notice during an emergency. A contractual arrangement should be put in place to permit procurement of these suits in a timely manner.

5.5 HIGH ANGLE RESCUE

- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive...emergency response program...This includes...access to a fully staffed, trained and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”
- Chapter II, Paragraph 3. b. (7), of DOE O 420.1B requires DOE sites to have “access to qualified, trained...fire fighting personnel to implement the requirements of this Order.”
- Section 5.4 of NFPA 1710 establishes minimum capabilities for a special operations response.
- Section 4.1 of DOE G 420.1-3 provides guidance regarding the provision of adequate emergency services.

Based on interviews with the fire chief, the LATA Kentucky D&D manager, as well as other safety professionals with LATA Kentucky, it was determined that USEC’s high angle rescue capabilities require attention.

Based on the D&D mission of LATA Kentucky, there are situations during the D&D process where there could be an injured worker who requires medical attention and removal from an elevated position. It appears that the USEC FD has the equipment (ladder truck), training, and capabilities to perform a high angle rescue, but there has not been any preplanning for such an event. The two primary D&D buildings—C-340 and C-410—have elevators that may not be operational and the interior stairs are narrow, both of which contribute to rescue challenges.

Based on the terrain around the two primary D&D facilities, full access to all elevated areas may not be feasible, thus it is important for the FD to plan for such a rescue. Due to the nature of the buildings, it might be possible for LATA Kentucky to provide access to areas of the buildings to facilitate a high angle rescue. For example, based on preplanning, LATA Kentucky could provide a large opening on the side of one of the buildings (e.g., C-340 and C-410) to permit better access by the USEC ladder truck should it become necessary.

Finding F-BNA-2011-3; USEC and LATA Kentucky should coordinate and preplan for a high angle rescue. The existing fire preplans (e.g., C-340 and C-410) should be revised to reflect this type of rescue. Necessary modifications to the structures identified during the review should be implemented by LATA Kentucky.

5.6 TRAINING, CERTIFICATION, AND FITNESS

- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive...emergency response program...This includes...access to a fully staffed, trained and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”
- Chapter II, Paragraph 3. b. (7), of DOE O 420.1B requires DOE sites to have “access to qualified, trained...fire fighting personnel to implement the requirements of this Order.”
- Section 5.2 of NFPA 1710 establishes minimum capabilities for fire suppression services, including training.

- Section 4.8 of DOE G 420.1-3 provides guidance regarding the provision of adequate training for site workers and emergency responders.

Based on interviews and information provided by the USEC FD, all firefighters are trained to meet state of Kentucky requirements for state certified Interior Firefighter level as well as EMT–Basic (EMT-B). Firefighters also are trained as HAZMAT technicians and are undergoing training in response to railcar incidents. Auxiliary E-squad members generally meet state of Kentucky requirements for state certified Interior Firefighter level; however, their training is not tracked by the state as is the firefighter’s training.

LATA Kentucky provides basic fire extinguisher training and limited training to all employees regarding response to site emergencies. Other than directing the USEC FD to the scene of an emergency and coordinating emergency response through the LATA Kentucky Emergency Management Program, LATA Kentucky employees are not expected to actively and intimately intervene in the response to an emergency, such as a fire, medical emergency, significant hazardous material release, or a technical rescue.

LATA Kentucky has a loosely implemented first responder program. The program is documented and protocols are approved by the LATA Kentucky medical director. All of the first responders are trained to BLS. There are currently 13 members, all on the day shift. Currently, the program is being evaluated by senior management and it will be more formalized in the future. For the purposes of this BNA, the LATA Kentucky program is a positive point for the program, but the BNA is not crediting the program or relying on the program to supplement USEC’s emergency response to LATA Kentucky facilities.

System Maintenance

- Section 2, Fire Protection, of 10 *CFR* Part 851, requires contractors to implement a “comprehensive fire protection program...including...compliance with NFPA codes and standards.”
- Chapter II, Paragraph b. (2), (d) of DOE O 420.1B requires comprehensive written procedures regarding the “operability, inspection, maintenance and testing” of fire protection features.
- Section 4.21 of DOE G 420.1-3 provides guidance pertaining to the inspection, testing, and maintenance (ITM) of fire protection features.

Procedures for ITM of fire protection systems for LATA Kentucky facilities have been developed and are implemented.

The impacts to the USEC FD from the LATA Kentucky ITM requirements for LATA Kentucky’s fire protection systems are modest since the buildings originally were maintained by USEC prior to LATA Kentucky’s contract. There may be impacts to the daily operations at the FD due to D&D, but at this point in time the impacts are not fully understood fully. The increase in the minimum staffing levels clearly will have a positive impact and likely will offset the increases from LATA Kentucky’s ITM requirements.

5.7 STANDARD OPERATING PROCEDURES, POLICIES, AND PRACTICES

- Chapter II, Paragraph b. (10) of DOE O 420.1B requires “Pre-fire strategies, plans, and standard operating procedures to enhance the effectiveness of site fire fighting personnel.”
- Paragraph 4.5.7 of DOE G 420.1-3 provides guidance regarding the scope and content of fire department standard operating procedures (SOPs).

- NFPA 1710 requires SOPs under certain response functions

A limited extent review of USEC FD policies and practices was conducted as part of this BNA. This included emergency incident preplans, as supplemented by LATA Kentucky. Based on direct feedback from USEC, this information is considered acceptable and conforms generally to DOE fire safety criteria and NFPA standards.

LATA Kentucky policies and procedures were reviewed (see Appendix B). These policies and procedures are the focus of other reviews and are also considered outside the scope of this BNA report.

The LATA Kentucky Emergency Management Plan and related documents (see Appendix B) were reviewed in conjunction with the BNA. They were developed to satisfy the requirements of DOE O 151.1C. They include specific procedures to follow in the event of fires and related events from an emergency preparedness perspective. The Emergency Management Plan and supporting documents provide specific detail where necessary in a readily accessible form. It complements the LATA Kentucky fire protection and emergency response policies and practices.

During interviews, the implementation and effectiveness of the cutting and welding permit program was discussed. It was evident that the program is well implemented and rigorous. The process to obtain a hot work permit is difficult. The level of difficulty to obtain a permit can have unintended consequences. On the one hand, it is critical to control hot work since hot work represents one of the primary fire initiators in a D&D facility as well as a major cause of fires across the United States. On the other hand, if a hot work permit is too difficult to obtain, this then opens the door for personnel to bypass the system, thus increasing the risk of fire from cutting and welding.

Opportunity for Improvement—OI-BNA-2011-6: The ES&H organization should sponsor a productivity improvement group to evaluate the hot work program to ensure the program has sufficient rigor, but is not too rigorous to potentially encourage personnel to bypass the system.

6. D&D STEP-OUT

LATA Kentucky's primary mission with the DOE is the D&D of identified facilities. As these buildings are fully demolished, clearly they no longer impact FD operations. From a needs perspective there will be a point when a sufficient number of facilities have been demolished that LATA Kentucky's FD needs will be reduced. From experience at other D&D locations (e.g., Rocky Flats), the reduction in the need for FD resources was not a linear function of the reduction of facilities as the D&D project progressed. For example at Rocky Flats, the FD was at nearly full staffing until June 2005 when it then went from a staff of approximately 50 to zero in one day. When the FD was disbanded, the D&D mission for the site was nearly complete; and from June 2005 onward, a contract was in place for a local FD to provide fire response for the final few months.

Clearly the effect of D&D progress on the USEC FD resource requirement will not be the same as it was at Rocky Flats, because other USEC facilities will remain and still require support from the FD; however, for the purposes of this BNA, that is not being considered.

From a LATA Kentucky perspective, once the final facility is demolished, the FD need is greatly reduced. It will not be reduced to zero, however, because LATA Kentucky still will have an ongoing mission (e.g., building C-746-Q).

From a pure LATA Kentucky perspective (ignoring the USEC buildings), when their D&D mission is accomplished, the staffing at the FD can be reduced by one or maybe two. As LATA Kentucky completes the D&D of their buildings, the FD staffing requirements will remain at the same level until the last facility is gone.

A lesson learned from the D&D mission at Rocky Flats was the importance of keeping the FD up-to-date on the status of the facilities and the areas around the facilities. Almost by definition, a D&D project is very fluid, and changes occur to the buildings and areas around the buildings on an almost daily basis. Examples include the elimination of access points, placement of heavy machinery, elimination of internal building lighting, etc. Most of these changes can significantly impact FD response to a fire, medical or hazardous materials emergency. It is critical for the USEC FD to be kept abreast of facility changes to the LATA Kentucky D&D facilities.

Opportunity for Improvement—OI-BNA-2011-7: The D&D organization should initiate a regular forum with the USEC FD to keep them up-to-date on LATA Kentucky’s D&D project. It is suggested that this forum meet monthly. The forum can consist of representatives from LATA Kentucky meeting the FD officers at the fire station to provide them with a briefing on any changes to the facilities, to a weekly drive-by with LATA Kentucky and USEC representatives.

7. CONCLUSIONS

The assessment confirmed that the USEC FD is capable of providing emergency and nonemergency services in a timely and effective manner to the LATA Kentucky facilities, except as noted within this report in the three findings and eight opportunities for improvement. The BNA evaluated USEC staffing for fire response concurrent with a casualty requiring medical assistance and determined that USEC is capable of satisfying governing criteria (10 *CFR* Part 851, 29 *CFR* Part 1910, DOE fire safety directives, and NFPA 1710), providing additional minimum staff is available.

Facilities under the control of LATA Kentucky manifest fire protection defense-in-depth and generally meet the requirements for Highly Protected Risks (HPR) as clarified in the above-referenced DOE criteria. The LATA Kentucky work activities that impact fire safety are being conducted under the principles and practices of the Integrated Safety Management System (ISMS), via PAD-PLA-SAF-001, *Integrated Safety Management System Description and Environmental Management System Description*.

Seven opportunities for improvement were identified by this BNA:

- (1) OI-BNA-2011-1: USEC FD’s use of nebulizers.
- (2) OI-BNA-2011-2: HF familiarization training for Mercy Regional EMS.
- (3) OI-BNA-2011-3: The minimum staffing number for the FD should be increased from three to four.
- (4) OI-BNA-2011-4: The outdated manual sampling gas detection tubes should be replaced with automatic air sampling gas detectors capable of continuously sampling for the presence of HF.
- (5) OI-BNA-2011-5: To ensure an adequate supply of Level A suits, a source of suits should be identified that can be made available on quick notice during an emergency. A contractual arrangement should be put in place to permit procurement of these suits in a timely manner.

- (6) OI-BNA-2011-6: The ES&H organization should sponsor a productivity improvement group to evaluate the hot work program to ensure the program has sufficient rigor, but is not too rigorous to potentially encourage personnel to bypass the system.
- (7) OI-BNA-2011-7: The D&D organization should initiate a regular forum with the USEC FD to keep them up-to-date on LATA Kentucky's D&D project. It is suggested that this forum meet monthly. The forum can consist of representatives from LATA Kentucky meeting the FD officers at the fire station to provide them with a briefing on any changes to the facilities, to a weekly drive-by with LATA Kentucky and USEC representatives.

Three Findings were identified by this BNA:

- (1) F-BNA-2011-1: A new WA that completely defines contractual obligations for emergency and nonemergency services from USEC to the LATA Kentucky should be established.
- (2) F-BNA-2011-2: USEC should dispatch a Mercy Regional ALS unit immediately for any HF emergency response at LATA Kentucky facilities (i.e., spills of more than 5 gal or any spill involving personnel exposure/injury).
- (3) F-BNA-2011-3: USEC and LATA Kentucky should coordinate and preplan for a high angle rescue. The existing fire preplans (e.g. C-340 and C-410) should be revised to reflect this type of rescue. Necessary modifications to the structures identified during the review should be implemented by LATA Kentucky.

8. FINDINGS, DEFICIENCIES, AND OPPORTUNITIES FOR IMPROVEMENT

Finding F-BNA-2011-1: A new WA that completely defines contractual obligations for emergency and nonemergency services from USEC to the LATA Kentucky facilities should be established. The current WA does not define staffing level or level of care requirements.

Finding F-BNA-2011-2: USEC should dispatch a Mercy ALS unit immediately for any HF emergency response at LATA Kentucky (i.e., spills of more than 5 gal or any spill involving personnel exposure/injury). In addition, a tiered ALS response for any incident involving multiple HF casualties should be available. This required dispatch protocol should be included in the WA agreement. LATA Kentucky should investigate a letter of agreement on these dispatches.

Finding F-BNA-2011-3; USEC and LATA Kentucky should coordinate and pre-plan for a high angle rescue. The existing fire preplans (e.g., C-340 and C-410) should be revised to reflect this type of rescue. Necessary modifications to the structures identified during the review should be implemented by LATA Kentucky.

Opportunity for Improvement—OI-BNA-2011-1: USEC EMTs have been trained on the utilization of calcium gluconate nebulizers and the nebulizers should be located/stocked on all EMS vehicles.

Opportunity for Improvement—OI-BNA-2011-2: LATA Kentucky should provide Mercy Regional with HF awareness training. The training should be equivalent to or in greater detail than what is provided to LATA Kentucky employees. Training should be provided at the Mercy Regional training room for all shifts. The training should be repeated at least annually.

Opportunity for Improvement—OI-BNA-2011-3: The minimum staffing level of USEC firefighters should be increased from three to four. This staffing level is required to meet the minimum response staffing based on the referenced requirements and the current procedures/protocols.

Opportunity for Improvement—OI-BNA-2011-4: To improve the timeliness of HAZMAT emergency response, the outdated manual sampling gas detection tubes currently in use by the USEC FD should be replaced with automatic air sampling gas detectors capable of continuously sampling for the presence of HF.

Opportunity for Improvement—OI-BNA-2011-5: To ensure an adequate supply of Level A suits, a source of suits should be identified that can be made available on quick notice during an emergency. A contractual arrangement should be put in place to permit procurement of these suits in a timely manner.

Opportunity for Improvement—OI-BNA-2011-6: The ES&H organization should sponsor a productivity improvement group to evaluate the hot work program to ensure the program has sufficient rigor, but is not too rigorous to potentially encourage personnel to bypass the system.

Opportunity for Improvement—OI-BNA-2011-7: The D&D organization should initiate a regular forum with the USEC FD to keep them up-to-date on LATA Kentucky's D&D project. It is suggested that this forum meet monthly. The forum can consist of representatives from LATA Kentucky meeting the FD officers at the fire station to provide them with a briefing on any changes to the facilities, to a weekly drive-by with LATA Kentucky and USEC representatives.

APPENDIX A
ASSESSOR CREDENTIALS

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ASSESSORS CREDENTIALS

Bruce Campbell, FSFPE

Bruce Campbell, FSFPE, Hughes Associates, Inc. Mr. Campbell has 33 years of experience in fire protection engineering including managing the fire protection programs at the former Rocky Flats Environmental Technology Site. He is Chair of NFPA 80 and NFPA 105 and has performed numerous Fire Hazard Analysis Reports for the DOE as well as commercial clients. He also has 8 years of experience with a Highly Protected Risk insurance carrier. He holds a B.S. degree in Fire Protection/Industrial Safety from the University of Maryland. Mr. Campbell is a Fellow in the Society of Fire Protection Engineers.

Robert Wheeler, PE

Robert Wheeler, P.E., Hughes Associates, Inc. Mr. Wheeler has 28 years experience in fire protection including the analyses of code requirements and intent relating to the fire safe design of structures, designs and reviews of fire safety systems, detection and alarm systems for structures, performance of risk assessments associated with fires in various occupancies based on specific fuels, and execution of analyses for unique structures. He holds a B.S. degree in Fire Protection Engineering from the University of Maryland.

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APPENDIX B
DOCUMENTS REVIEWED

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DOCUMENTS REVIEWED

- BJC/PAD-427 R7, *Hazard Analysis for the C-746-Q Hazardous and Low-Level Waste Storage Facility Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- BJC/PAD-450 R7, *Hazard Analysis for the C-410 D&D Project*
- BJC/PAD-462 R7, *Documented Safety Analysis for the C-746-Q Hazardous and Low-Level Waste Storage Facility, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- BJC/PAD-483/R10, *Fire Hazards Analysis for the C-746-Q Hazardous and Low-Level Waste Storage Facility.*
- BJC/PAD-484/R6, *Fire Hazards Analysis C-410, 411, 420 Complex Decontamination and Decommissioning Facility*
- BJC/PAD-498 R8, *Technical Safety Requirements for the C-746-Q Hazardous and Low-Level Waste Storage Facility Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- BJC/PAD-499 R8, *Documented Safety Analysis for the C-410 D&D Project, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- BJC/PAD-500 R10, *Technical Safety Requirements for the C-410 D&D Project Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- C5EC90000A046 R4, *PGDP Facility Lease Status (Drawing)*
- DOE O 420.1B, *Facility Safety*
- DOE G 420.1-3, *Implementation Guide for DOE Fire Protection*
- DOE Model Fire Protection Baseline Capabilities
- DOE O 420.1A Technical Position OTP 2002-2
- DOE Office of Nuclear and Facility Safety Policy, Technical Position OTP 2002-2 (This clarifies that NFPA 1710 is required to be evaluated in the context of conducting a BNA)
- Governing NFPA Standards including, but not limited to Standard 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Operations, and Special Operations to the Public by Career Fire Departments*
- *Hydrofluoric Acid Supplemental Guidelines, Mercy Regional EMS*
- NRC Safety Evaluation Report – NUREG 1851 (Section 7.0, Fire Safety)
- PAD-PROG-0030, *Fire Protection Program Description*
- PAD-ENG-0050, *Fire Protection Engineering Assessments*

- PAD-ENG-0051, *Controlling Combustibles & Ignition Sources*
- PAD-ENG-0052, *Fire Hazard Analysis*
- PAD-ENG-0053, *Fire Extinguisher Inspection & Maintenance*
- PAD-ENG-0054, *Inspection of Flammable Liquid Storage Cabinets*
- PAD-NS-0040/R3, *LATA Kentucky Facility, Hazard Categorization and Classification, and Safety Basis Document List*
- PAD-PLA-PM-008 R1, *LATA Kentucky Site Emergency Plan for the Paducah Remediation Project*
- PAD-PLA-SAF-001, *Integrated Safety Management System Description and Environmental Management System Description for the Paducah Environmental Remediation Project, Paducah, Kentucky.*
- SAD-PH-C340ABCDE-001/R1C1, *Safety Analysis Document for the C-340 Complex (A/B/C/D/E) Decontamination and Decommissioning Project Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- PAD-REG-0037, *Spill Prevention, Control, and Countermeasure Plan for the DOE Paducah Site, McCracken County, Kentucky*
- PAD-SH-2020, *Hot Work*
- PRS-ARR-0002, *Decontamination and Decommissioning Fire Hazards Analysis for the C-340 Metals Reduction Plant Complex*
- PRS-ARR-0002, *Decontamination and Decommissioning Fire Hazards Analysis for the C-340 Metals Reduction Plant Complex*
- USEC Safety Analysis Report (Section 5.4, Fire Protection), Rev 86, August 15, 2007
- Work Authorization 25973, Modification 29, *Paducah Fire, Emergency, and PSS*

APPENDIX C
PERSONNEL INTERVIEWED

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PERSONNEL INTERVIEWED

- LATA Environmental Services of Kentucky, LLC, (LATA Kentucky) Environment, Safety, Health Manager
- LATA Kentucky Emergency Program Manager
- LATA Kentucky Decontamination and Decommissioning Manager
- LATA Kentucky Nuclear Safety Manager
- LATA Kentucky Radiation Protection Manager
- LATA Kentucky Engineering Manager
- LATA Kentucky Fire Protection Coordinator
- United States Enrichment Corporation Fire Services and Emergency Management Manager
- Safeguards and Security/Emergency Preparedness Manager
- Mercy Regional Emergency Management System Management

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