Running head: CONTINUITY OF OPERATIONS FOR EPFD

Continuity of Operations for the El Paso Fire Department

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

Abstract

The problem was that the El Paso Fire Department (EPFD) did not have a continuity of operations plan (COOP) that would ensure that critical response positions are filled during a community crisis. The purpose of this research was to prepare a COOP development and implementation plan that addresses the potential for significant absenteeism of EPFD personnel during a community crisis. Action research methodology was used to answer four research questions. What are the generally accepted characteristics and components of COOPs for organizations such as the EPFD? What process or processes are used by other organizations to develop COOPs? What plans have been implemented by other fire departments and/or organizations? How are other fire departments and organizations' business continuity plans tested for validity? The literature review identified best practices for COOPs and the COOP development process. Texas fire departments were polled for comparison to the literature findings and EPFD members were surveyed to determine their present state of disaster preparedness and for their own knowledge regarding existing disaster response plans. Recommendations were made to follow the DHS seven step process and prepare a COOP within six months that includes the following eleven core best practices elements. Further recommendations were made to instill a continuity culture within the department by regularly training on the COOP and using National Disaster Preparedness Month each year to encourage disaster preparedness among employees and their families.

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Introduction

The El Paso Fire Department (EPFD) does not have a continuity of operations (COOP) plan that ensures that critical response positions are filled during a community-wide crisis. The purpose of this paper is to identify best practices for developing and implementing a COOP plan that will address the potential for significant absenteeism of EPFD personnel during a disaster or crisis. Utilizing the action research method, this project addresses the following questions: (a) What are the generally accepted characteristics and components of COOP plans for emergency response organizations such as the EPFD, (b) what process or processes are used by other departments or organizations to develop a COOP plan, (c) what is the present state of EPFD's resilience to a disaster of catastrophic proportions, and (d) how are other fire departments or organizations' COOP plans tested for validity?

Background and Significance

In August, 2005, Hurricane Katrina devastated a New Orleans community previously confident in their emergency operations plans. Overnight, critical emergency operations were disabled and many suffered for the lack of local help in the ensuing days. Police and firefighters, many victims themselves, were either ill-equipped or simply unable to handle the magnitude of the catastrophe that befell them. Ironically, the New Orleans region had just completed a disaster exercise dubbed 'Hurricane Pam' the year before and responders knew the potential devastation a major hurricane could bring (United States Senate Committee on Homeland Security and Governmental Affairs, 2006).

Hurricane Katrina reinforced the notion that plans are critical administrative documents only effective if they are timely, relevant, and undergo periodic review (Herzog, 2007; Gallagher, 2003). Despite this, many organizations and communities continue to overlook the possibility that their emergency response plans may be unrealistic or unworkable in times of disaster. Unrealistic response plans may give officials and citizens a false sense of security. In turn, this false sense of security may discourage efforts to build resiliency in local governments and their communities.

Resiliency is more specifically defined as the ability of an organization to recover from the devastating effects of a disaster or major incident (Sheffi, 2005, p. 12). Companies that fail to build resiliency in their supply chains, for instance, are more likely to close down or worse, discontinue operations permanently in the wake of a catastrophic disaster. Sometimes even small disruptions in a firm's supply chain can have devastating consequences for an ill-prepared organization (Sheffi, 2005; Taleb, N., 2008). Though typically associated with the continuity of private firms, continuity of government and its underlying supply chain is just as important, if not more so.

In terms of disaster preparation, most communities across the United States have local emergency response plans with operating guidelines already in place. El Paso is no exception. Emergency response guidelines for community emergencies in El Paso are covered by the El Paso County Emergency Operations Plan (EOP). The EOP with its 22 annexes provides for a regional approach to various potential emergencies in the County of El Paso. The El Paso Fire Department is one of a number of agencies with emergency response mandates under the plan (El Paso Emergency Management Office, 2005).

At present, no annex exists in the EOP for continuity of the local government during disasters. Even if one is developed in the near future, however, agency-specific plans are unlikely to be included. This begs the question, if continuity plans at the community level fail to take into account underlying agencies' continuity, how effective can the plans really be? In other words, if the EPFD is unable to fulfill its emergency response duties during a disaster, the community's continuity of operations plan will fail. At the very least, certain components of the EOP will not be implemented adequately. It is the aim of this research project to explore the EPFD's resiliency more fully and is directly aligned with the United States Fire Administration's (USFA) operational objective of improving local planning and preparedness (USFA, 2009). Moreover, in line with the National Fire Academy's Executive Development course objectives, the ultimate goal of this work is to encourage a resiliency culture among EPFD's membership and build an organization capable of meeting its local mandate regardless of the external circumstances.

To date, the only major emergency in El Paso that required activation of the emergency response plan occurred in late July and early August, 2006. During the course of a month, heavy rains fell on the El Paso area saturating the ground and overflowing flood control dams around the city. The Emergency Operations Center was activated for the duration of the emergency and response was elicited from many local response organizations including the EPFD. Remarkably, no major damage occurred to EPFD stations or equipment, though some firefighters experienced personal losses associated with the flooding.

The floods of 2006 highlighted, however, the importance of ensuring the resiliency of EPFD assets during an emergency of community-wide proportions. Regardless of what the EOP dictates for fire department functions, the EPFD should realistically expect scores of department personnel and equipment to be unavailable for use in the event of a major disaster and plan for continuity of operations accordingly.

Literature Review

Since the creation of the U.S. Constitution and its provision for a Vice President to succeed the President, continuity of government has been an important part of American governance. Given the length of time this concept has held sway, one would expect a rich reservoir of information on the successes and failures of COOPs in America.

In terms of raw information, there exists no shortage of advice from practitioners of the planning and preparation craft. Appendix A, for instance, lists a number of current websites dedicated to the preparation COOPs and disaster recovery plans. However, recent disasters and their impact on organizations both public and private suggest that current “best practices” in COOP planning are a work in progress (Committee on Homeland Security and Governmental Affairs, 2006). Indeed the increasing globalization of commerce and integration of international supply chains means regional disasters can have far-reaching consequences for other locales or organizations (Sheffi, 2005; Norrman & Jansson, 2004). Despite the limited availability of empirical research on the testing of continuity plans, there is a fairly broad consensus on the basic elements of COOPs and what steps are involved in the COOP development process.

COOP Elements

Regardless of whether the planning organization is public or private, much of the literature on COOP elements relies on the recommendations of the following industry standards: (a) NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs; (b) ISO/PAS 22399, ASIS International Organizational Resilience: Preparedness and Continuity Management – Best Practices Standard; (c) BS 25999-1 & 2, Business Continuity Management; and (d) CSA Z1600, Standard on Emergency Management and Business Continuity Programs (Clas, 2008; ASIS International, Disaster Recovery Institute International, NFPA, & Risk and Insurance Management Society, Inc., 2008; NFPA, 2010).

ISO/PAS 22399 and CSA Z1600 both rely heavily on NFPA 1600 (ASIS International, 2007; "CSA Issues Business Continuity Standard", 2009). BS 25999 is a product of the BSI Group, the British Standards Institute, and like its other disaster preparedness counterparts, is intended for organizations of all sizes public and private (BSI Group, 2006). Interestingly, despite the lack of scientific research on the efficacy of business continuity best practices, all of the aforementioned documents recommend similar core elements that should be included in a COOP document.

NFPA 1600, for instance, lists the following items that should be included in every COOP: "(a) Laws and authorization, (b) risk assessment, (c) incident prevention, (d) mitigation, (e) resource management and logistics, (f) mutual aid/assistance, (g) interoperable communications, and (h) incident management" (NFPA, 2010, p. 7-8).

The United States Department of Homeland Security (DHS) recommends the following major elements and is based on elements used in federal continuity planning:

(a) Program plans and procedures, (b) risk management, (c) budgeting and acquisition of resources, (d) essential functions, (e) orders of succession, (f) delegations of authority, (g) continuity facilities, (h) continuity communications, (i) vital records management, (j) human capital, (k) test, training, and exercise program, (l) devolution of control and direction, (m) reconstitution operations, (n) continuity plan implementation, (o) acronyms, (p) glossary, and (q) authorities and references (DHS, 2009, p. 6-14).

Cashen (2006) examined national and international COOP plans for similarity and was able to isolate additional elements worthy of inclusion in a COOP. Among these additional components are: "(a) purpose/objective, (b) applicability and scope, and (c) classification of emergencies for COOP responses", though emergency classification may be found in the risk analysis portion of other COOP templates (p. 39-46).

The COOP Development Process

Quarantelli (1997) suggests a 10-point approach to preparedness planning that applies equally well to COOP planning:

1. Disasters should be viewed differently from accidents and minor emergencies.
2. Planning should be an ongoing process and not performed with the exclusive goal of an end-product such as a written plan.
3. Planning should take an all-hazards approach.
4. Coordination of emergent resources, rather than imposition of command and control, should be the focus of planning models. This emphasizes the

importance of the human capital factor and the value of good decision-making under duress.

5. Planning should focus on general principles or guidelines rather than prescriptive details.
6. Assume that potential victims will react well rather than poorly during an emergency.
7. Incorporate intra- and inter-organizational integration into the plan.
8. Anticipate likely problems (risk assessment) and prepare possible solutions or options.
9. Build on social-science research findings derived from systematic data rather than personal anecdotes or ‘war stories’.
10. Include all standard planning phases: mitigation, preparedness, response and recovery (p. 41).

DHS has developed the “continuity planning model” for business continuity planners to follow when beginning the COOP development process. The model is composed of six general steps and is illustrated in Figure 1. The purpose of the process is to instill the idea of continuous evaluation and program management. Agencies should not develop their plans and assume the plans have an unlimited shelf life (Grimaldi, 2002).

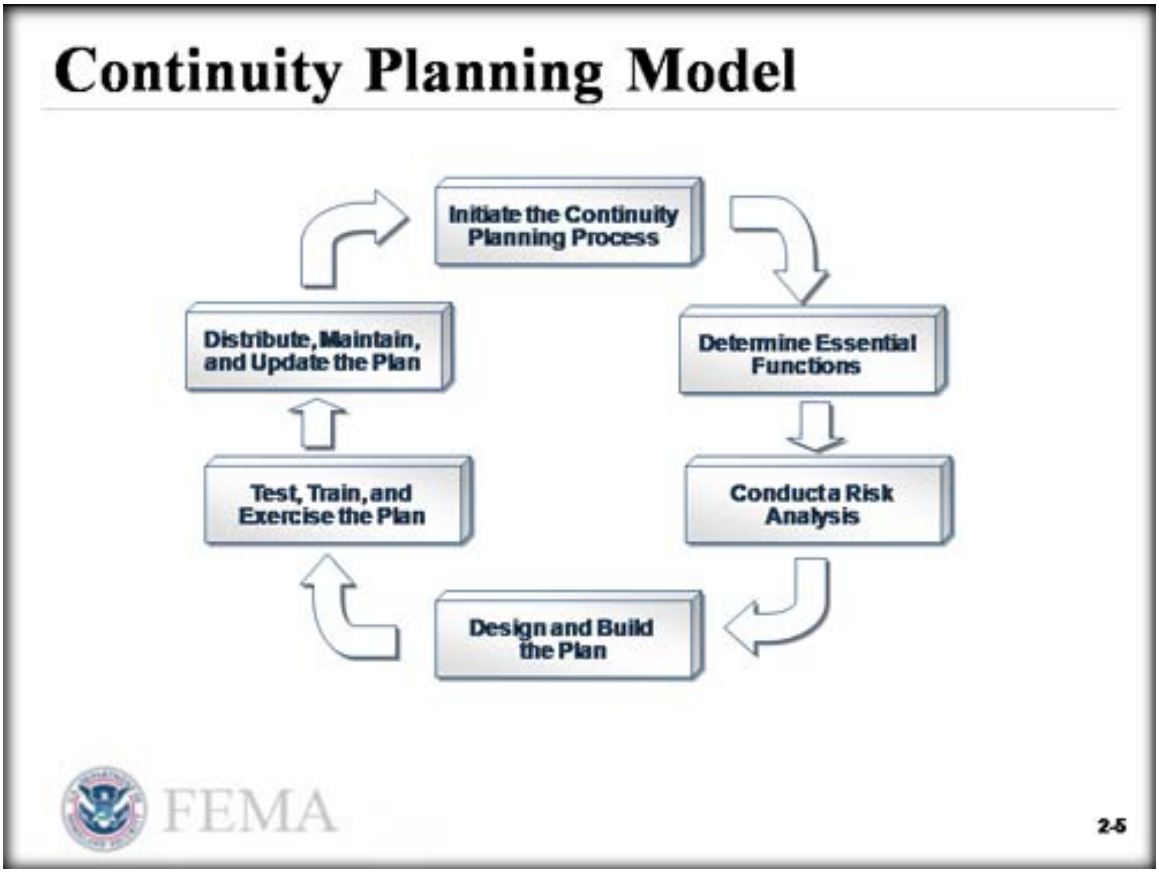


Figure 1. FEMA's version of the COOP process (DHS, 2008, p. 2-7).

Clas (2008) breaks the process down a little more thoroughly, but the major elements of the process are similar to DHS:

1. Initiate the program by gaining management support and forming a planning team. Conduct a risk assessment and identify potential controls to minimize disruption.
3. Analyze impacts of adverse incidents.
4. Recommend continuity strategies.
5. Determine organizational resiliency.
6. Develop the continuity plan.
7. Conduct awareness and training for organizational members.

8. Exercise and maintain the plan.
9. Develop crisis communications procedures.
10. Coordinate the plan with external agencies (p. 47-48).

NFPA(2010) recommends that an organization's leadership commit to the process of COOP planning by (a) preparing policies and procedures for program implementation, (b) assigning an adequate amount of resources to program development and maintenance, and (c) ensuring reviews and evaluations are conducted and deficiencies are corrected (p. 6).

COOP Testing and Plan Efficacy

As noted earlier, data on the testing of existing COOPs is sparse. Nevertheless, the literature on COOPs indicates that testing and evaluation are critical components of the plan itself (NFPA, 2010; DHS, 2008; Tarra, 2008; Grimaldi, 2002). DHS has developed a fairly comprehensive list of ways to test COOPs for effectiveness. Annual exercises help ensure plan validity and provide opportunities to spot deficiencies in the process or the capabilities of responders (DHS, 2008, p. 10). Exercise types include: "seminars, workshops, tabletop exercises, games, drills, functional exercises and full-scale exercises" (DHS, 2010). Each type of exercise has its advantages and disadvantages for testing the validity of organizational plans. Table 1 summarizes the basic types of exercises, their applicability and involvement of key resources for COOP testing purposes.

Table 1

Exercise Types for Evaluating COOPs

Test/Exercise Type	Purpose	Resource Involvement/Cost
Tabletop	Solve scenario-based problems in a group discussion and evaluate plan elements	Key personnel, but not response personnel Low cost
Functional	Hands-on exercise designed to test various functions of the plan	Response personnel and equipment appropriate for the particular function Increased personnel-related expenses from tabletop
Full-scale	Combines the elements of the tabletop and functional exercises, so major portions of the plan can be tested for validity	Key personnel and response personnel along with extensive use of physical resources and facilities Can be very costly depending on scale

Note. Adapted from "Standard on Disaster/Emergency Management and Business Continuity Programs," by the NFPA, 2010, p. 26.

The federal government has been testing agency COOPs for a number of years. The Government Accountability Office (GAO) reports that opportunities for improvement among a number of federal agencies abound, but it is silent on whether or not the particular testing chosen was appropriate for the evaluation performed (GAO,

2005). The situation had not improved two years later even though federal agencies were required to submit the reasons for selecting particular tests or exercises (GAO, 2007).

Interestingly, the lack of quantifiable data on COOP testing may be due in part to the confidentiality of the plans themselves. The state of Florida, for instance, allows certain plans such as COOPs, which contain sensitive vulnerability data, to remain out of the public domain. The Public Records/Security-system Plan Act of 2001 specifically exempts from public records disclosure rules security plans of many Florida agencies. Although the law allows for Florida government agencies to share their sensitive information with each other, COOP documentation is not readily available to the casual researcher. Other agencies including the federal government place similar restrictions on their COOPs (Massachusetts Department of Developmental Services, 2009; Peterson, 2003).

Procedures

A comprehensive search for continuity planning elements and processes was conducted using the Learning Resource Center at the National Fire Academy and the University of Texas-El Paso (UTEP) online library resources. A search was made for social science research regarding the efficacy of existing disaster plans to discover best practices for evaluating COOPs. A search of government documents and government websites was also conducted regarding continuity of operations to obtain the latest recommendations from the U.S. federal government regarding the development and implementation of COOPs.

In addition to a literature search, the researcher conducted one self-administered questionnaire of the El Paso Fire Department using an online survey tool,

SurveyMonkey. The questionnaire was designed to determine the present state of EPFD's resilience to disasters by focusing on its most important resource, its human capital. The self-administered on-line survey tool was conducted from March 8 – March 31, 2010 (see Appendix B for the survey template). Survey requests were emailed to the entire department staff of 1020 on March 8 and a follow up posting on the department Intranet was initiated on March 24, 2010 and again on March 29, 2010. The survey was closed on March 31, 2010.

Additionally, a poll was conducted from March 8 – March 27, 2010 of the top 47 Texas fire departments (based on number of firefighters and number of fire stations). The list of departments was limited to EPFD's peer departments due to time constraints and was obtained from the USFA's fire department census database (USFA, 2010). A survey request was sent via email to the most likely person in each department responsible for COOP planning (see Appendix C for the NFIRS list and agency contacts). Respondents were polled using SurveyMonkey (see Appendix D for the poll questions).

Results

The Core Elements of a COOP

Table 2 compares the elements included in a number of best practices COOP documents. There is clearly strong consensus on what elements should be part of a business continuity program. However, not all of the documents make it apparent which information should be included in the final COOP and which information should simply be used to formulate the plan and left out of the final document. NFPA 1600, for instance, discusses all of the elements listed in Table 1, but limits the contents of the plan document to those listed previously in the Literature Review. Some authorities having

jurisdiction mandate which items must be included in agency COOPs (Maryland Emergency Management Agency, 2005; United States Department of Homeland Security, 2008).

Table 2

Standard COOP Elements

COOP Element	NFPA 1600/CSA Z1600	DRII	Cashen (2006)	Miami-Dade Template	Maryland Emergency Mgmt Template	BSI Group, BS 25999	DHS, CGC 1
Essential functions	x	x	x	x	x	x	x
Orders of succession	x	x	x	x	x	x	x
Delegations of authority	x	x	x	x	x	x	x
Alternate facilities	x	x	x	x	x	x	x
Interoperable communications	x	x	x	x	x	x	x
Vital records	x		x	x	x	x	x
Human capital	x		x	x	x	x	x
Test, training and exercise	x	x	x	x	x	x	x
Devolution				x	x	x	x
Reconstitution	x	x		x	x		x
Program management	x	x	x	x	x	x	x
Risk analysis	x	x	x	x	x	x	x
Business impact analysis	x	x		x	x	x	x
References	x	x	x	x	x	x	x
Implementation procedures	x	x	x	x	x	x	x
External interfaces to other organizations	x	x			x	x	x
Lines of authority	x	x		x	x	x	x
Logistics and resource requirements	x	x	x	x	x	x	x
Purpose/obje	x	x	x	x	x	x	x

COOP Element	NFPA 1600/CSA Z1600	DRII	Cashen (2006)	Miami-Dade Template	Maryland Emergency Mgmt Template	BSI Group, BS 25999	DHS, CGC 1
ctive							
Applicability and scope	x	x	x		x	x	x
Incident command system	x	x	x		x	x	x
Photographs, charts, rosters, maps			x		x	x	x
Acronyms					x	x	x
Glossary	x				x	x	x
Prevention strategy		x				x	x
Public information	x	x		x	x	x	x
Security	x	x					x
Health/pandemic annex				x			

Note. DRII is the Institute for Continuity Management.

Texas Fire Department Questionnaire Results

It is not a requirement in Texas for fire departments to develop their own COOPs, but a number have already done so. Fifteen of the 47 departments polled responded to the questionnaire and seven indicated they have a COOP in place (see Table 3). Smaller departments indicate a lack of continuity preparation in greater numbers than larger ones. Since this sample is not representative of the general population of Texas fire departments, it is difficult to infer whether that trend continues among all departments with less than 250 firefighters. Additionally, since the questionnaire did not query why a department may or may not have developed a COOP plan, it cannot be determined whether size was the reason for not spending time to prepare a COOP.

Table 3

Major Texas Departments and COOP Development Status

Does your agency have its own Continuity of Operations Plan(COOP)?

	How large is your agency in terms of total authorized staffing (including non-uniformed)?					
Answer Options	**100-250**	**250-500**	**500-1000**	**>1000**	**Response Percent**	**Response Count**
Yes	3	1	0	3	46.7%	7
No	8	0	0	0	53.3%	8
					answered question	**15**
					skipped question	**0**

Among the seven respondents who have a COOP plan, one failed to indicate what COOP elements were in their plan. However, among the remaining six respondents certain elements persist. Table 4 displays the results of COOP element frequency among Texas COOPs. It is interesting to note that the least frequent elements involve human capital issues (i.e., dependent care, and lodging and food).

Table 4

Common Elements Among Texas Fire Department COOPs

Please mark all the features your COOP includes from the list below:

	How large is your agency in terms of total authorized staffing (including non-uniformed)?				
Answer Options	**100-250**	**250-500**	**500-1000**	**>1000**	**Response Count**
Purpose/objective Plan Item	3	0	0	3	
	3	0	0	3	6
Applicability and scope Plan Item	3	0	0	3	
	3	0	0	3	6
Authority and references Plan Item	3	0	0	2	
	3	0	0	2	5
Implementation Plan Item	3	0	0	3	

Please mark all the features your COOP includes from the list below:

	How large is your agency in terms of total authorized staffing (including non-uniformed)?				
Answer Options	**100-250**	**250-500**	**500-1000**	**>1000**	**Response Count**
	3	0	0	3	6
Emergency classification Plan Item	3	0	0	3	
	3	0	0	3	6
Orders of succession Plan Item	3	0	0	3	
	3	0	0	3	6
Essential functions Plan Item	3	0	0	3	
	3	0	0	3	6
Alternate operating locations Plan Item	3	0	0	2	
	3	0	0	2	5
Communications Plan Item	3	0	0	2	
	3	0	0	2	5
Records Plan Item	3	0	0	2	
	3	0	0	2	5
Financial management Plan Item	1	0	0	2	
	1	0	0	2	3
Security measures Plan Item	1	0	0	3	
	1	0	0	3	4
Dependent care Plan Item	1	0	0	1	
	1	0	0	1	2
Transportation/lodging/food Plan Item	0	0	0	1	
	0	0	0	1	1
Plan Testing Plan Item	2	0	0	2	
	2	0	0	2	4
Plan management/maintenance Plan Item	2	0	0	3	
	2	0	0	3	5
			answered question		**6**
			skipped question		**9**

With regard to plan testing and evaluation, respondents were split evenly between those that periodically test and those that don't. Table 5 summarizes the responses to that question. The results harmonize with the responses to plan testing as a COOP component in Table 4. Fire departments that exclude plan testing as a core element of the COOP are unlikely to formalize the process for testing and evaluating the COOP on a regular basis.

Table 5

COOP Testing Policy Among Texas Fire Departments is Not Universal

Is there a regular process for COOP testing/evaluation?

	How large is your agency in terms of total authorized staffing (including non-uniformed)?					
Answer Options	**100-250**	**250-500**	**500-1000**	**>1000**	**Response Percent**	**Response Count**
Yes	2	0	0	2	50.0%	4
No	2	1	0	1	50.0%	4
				answered question		**8**
				skipped question		**7**

The COOP Development and Management Process

With the most recent edition of its business continuity program standard, the NFPA has attempted to follow the continuous improvement process model of 'plan, do, check, act' introduced by Walter Shewhart in the 1920's and then later popularized under the model 'plan, do, study, act' by Dr. W. Edwards Deming (Arveson, 1998; Krajewski, Ritzman, & Malhotra, 2010). The 'Deming Wheel' as it is more popularly known, puts all four processes in one continuous loop, so the COOPs should undergo constant refinement over time (see Figure 2). The COOP process begins with program initiation then moves to the planning process (plan). Once the planning is complete, the COOP program team focuses on implementation aspects (do). The next phase involves testing and exercising the plan (check/study) and finally program improvement (act) completes

the cycle (NFPA, 2010, p. 6 – 10). This is very similar to the DHS model depicted in the Literature Review.

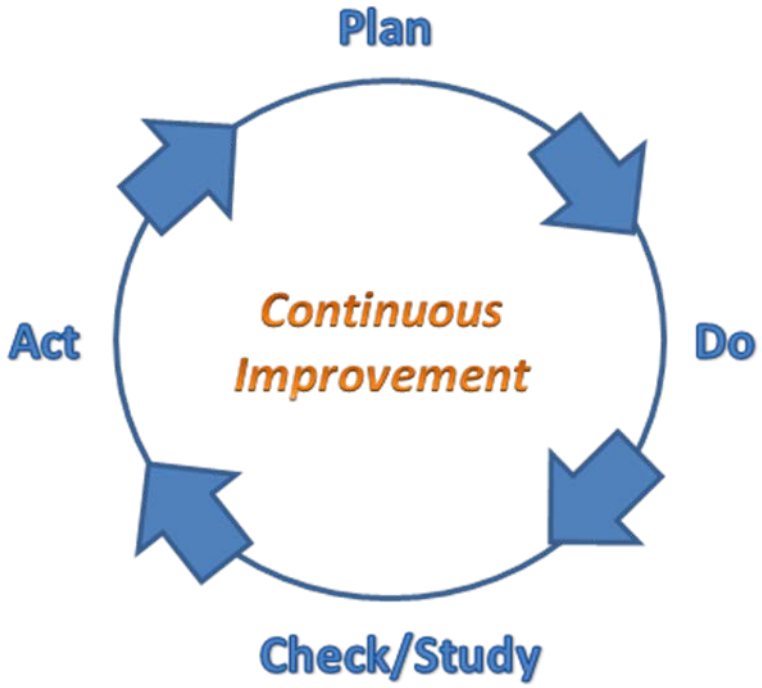


Figure 2. W. Edwards Deming's PDSA model of continuous improvement has been adapted for use in continuity operations program management by the NFPA.

Internal Questionnaire Results

Total responses for the internal questionnaire were 263 for an overall response rate of 25.7% (N=1020). Table 6 summarizes the responses by assignment and compares the total with the overall department population. Response rates for officers and non-officers were split equally at 43.5% (n=93) and 46.7% (n=100) of the total.

Table 6

Internal Survey Respondent Breakdown

	I am:				
Answer Options	**a non-uniformed/civil service employee**	**a uniformed/collective bargaining agreement employee**	**Response Percent**	**Response Count**	**Dept. Total**
non-uniformed	49	0	18.6%	49	173
uniformed	0	214	81.4%	214	847
			answered question	**263**	1020
				response rate	25.8%

One of the questions the survey was designed to answer was how well-prepared are the EPFD's personnel for a community-wide disaster? Table 7 displays the results for personal disaster readiness. More than half of the respondents (n=146) indicated their own families are not prepared for a disaster with a family disaster plan. Of the 117 who indicated their families have a disaster plan, only 57% (n=67) reported having practiced that plan (see Table 8).

Table 7

Family Disaster Planning Among EPFD Employees

My immediate family and I have developed a family disaster plan.				
	I am:			
Answer Options	**a non-uniformed/civil service employee**	**a uniformed/collective bargaining agreement employee**	**Response Percent**	**Response Count**
True	12	105	44.5%	117
False	37	109	55.5%	146
			answered question	**263**
			skipped question	**0**

Table 8

Testing Rates for Family Disaster Plans

My family and I have practiced our family disaster plan.				
	I am:			
Answer Options	a non-uniformed/civil service employee	a uniformed/collective bargaining agreement employee	Response Percent	Response Count
True	8	59	25.5%	67
False	28	109	52.1%	137
N/A	13	46	22.4%	59
			answered question	**263**
			skipped question	**0**

In addition to disaster readiness among EPFD employees, the self-administered questionnaire attempted to gauge how knowledgeable members are regarding the EOP and whether or not they understood their own role during a disaster. Tables 9 and 10 summarize the results. Interestingly, most department employees expect to be called in to work during a crisis, yet 52.5% (n=138) do not understand what their role or function would be if the EOP were activated.

Table 9

EPFD Employees' Expectation to Work During a Crisis

During a community-wide crisis, I expect to be called in to work regardless of my regular work schedule.				
	I am:			
Answer Options	a non-uniformed/civil service employee	a uniformed/collective bargaining agreement employee	Response Percent	Response Count
True	37	208	93.2%	245
False	12	6	6.8%	18
			answered question	**263**
			skipped question	**0**

Table 10

Employee Knowledge of Their Place Within the EOP

I understand my role or function during an emergency under the El Paso County Emergency Response Plan.				
	I am:			
Answer Options	**a non-uniformed/civil service employee**	**a uniformed/collective bargaining agreement employee**	**Response Percent**	**Response Count**
True	21	104	47.5%	125
False	15	81	36.5%	96
I don't think I have a role or function under the plan	13	29	16.0%	42
		answered question		**263**
		skipped question		**0**

Discussion

Resiliency of government operations is an important part of a community's long-term health. Disaster can strike a locale at any time in many different forms. The latest concern involves a potentially virulent flu strain and its potential impact not only on business, but also on government operations. DHS predicts 40% or more absenteeism if a pandemic occurs (DHS, 2009, p. 2). This has serious repercussions for continuity of operations in every organization affected. It stands to reason that development of a COOP is good business practice for the EPFD. The basic elements listed in Table 11

should form the basis of every COOP regardless of whether the COOP is agency specific or designed for overall community resilience.

Table 11

Best Practices COOP Elements

Core Element	Summary
Program Manager/Team	The project team and leader who will be responsible for coordinating, developing, and maintaining the COOP. A team leader should be assigned to guide the process and obtain buy-in from management.
Purpose, Applicability & Scope	The purpose of the business continuity plan should be delineated as well as how comprehensive its application should be. Included in this element is whether or not the plan takes an "all hazards" approach.
Risk Assessment & Business Impact Analysis	The planning team should identify the likeliest risks an organization faces as well as the potential impact those events may have on the organization.
Essential Functions	A list and explanation of all mission critical functions should be developed. Essential functions are the cornerstone of resource matching in preparation for an emergency.
Legal Issues, Authorities, & References	All relevant federal, state, and local laws should be addressed in COOP development.
Implementation	Procedures should be developed for implementing the plan during a crisis. Implementation should include notification of key personnel, appropriate delegations of authority, orders of succession, vital record maintenance, and financial considerations. Devolution should be part of the plan if the agency's management is incapacitated. The plan should stipulate how key functions and positions will be assumed by personnel at alternate facilities if such an event should occur.
Logistics	The plan should include identification of critical resources and alternate facility locations.
Interoperable Communications	External contacts should be identified and the means of communicating with other

Core Element	Summary
	organizations should be clearly established.
Staff/Dependent Care Plan	This portion of the plan should make it clear how staff will be accommodated, fed, and utilized. Additionally, dependent care should include similar arrangements for the families of key responders.
Incident Command System	An incident command system as adopted by the National Incident Management System should be a component of every plan.
Testing, Training, and Plan Evaluation	Training all organizational personnel on the COOP is a critical part of plan success. Additionally, testing and evaluation ensure that continuity planning is an ongoing process and not simply a pre-event project with concrete timelines.

The development of a COOP should likewise follow a fairly standard routine across most organizations. It is unclear how the process in America became standardized, but guidance from the federal government has now made the seven-step process an industry standard to follow (see Figure 1). The federal government model is easy to follow, continuous in flow, and encourages constant re-evaluation and continuous improvement. COOP planners in both the public and private sector are encouraged to follow the guidance from CGS 1 and from NFPA 1600 with regard to COOP program implementation and management.

Despite all the federal government guidance, COOP planning is still relatively new at the state and local level. More than 15 years of federal direction and a number of major U.S. disasters have done little to raise the urgency level among local planners. As demonstrated by the external questionnaire results, some larger Texas fire departments are still unprepared for disasters that may severely damage or limit access to their

physical resources. And plans that do exist may not have been tested for validity. This may have serious repercussions for the continuity plans that have been developed for those agencies' respective communities.

In El Paso, an emergency management plan for the county exists and has been in force for decades. However, as indicated by the internal questionnaire results, many EPFD members are unaware of their role in that plan regardless of the type of emergency. Additionally, few of the EPFD's personnel have taken the added steps of preparing their own families for disaster. Consequently, it is reasonable to assume that a significant number of EPFD's workforce will be unavailable during a community-wide emergency as they try to take care of their family after an event occurs.

Resiliency and Organizational Culture

An interesting and growing body of literature on the concept of social capital is beginning to reshape the way planners view resiliency. Social capital conveys the idea that organizations can build into their culture strong internal and external relationships that enhance their continuity potential (Murphy, 2006; BSI, 2006). Fire departments with strong internal bonds should be able to capitalize and encourage close workplace identities and relationships. In times of crises, these relationships are expected to encourage responders' reliance on each other for support and provide the response flexibility some disasters require.

Nevertheless, it is incumbent upon continuity planners to build within the organization a continuity culture that moves beyond traditional social networking (Nilsson & Eriksson, 2008). Frequent continuity training is essential and cross training among response personnel is critical to ensuring critical response functions are covered

during disasters. Moreover, commitment on the part of senior agency officials is absolutely critical to the success of COOPs. Without the necessary resources, even the most capable of COOP program managers will fail (Grimaldi, 2002).

Recommendations

EPFD's COOP development process should proceed along the timelines identified in the GANTT chart in Figure 1E. Management buy-in is critical. Additionally, the COOP should contain all of the core elements contained in Table 11 with an emphasis on the training and testing phases of the COOP.

Since human capital is such a critical component of COOP implementation and success, EPFD should focus on raising awareness of disaster preparedness and COOP planning internally. All department members should be encouraged to have a family disaster plan in place and fire stations should be stocked for extended disaster operations. Additionally, National Disaster Preparedness Month in September each year is a perfect opportunity for the EPFD to train its members in the implementation of the local COOP and conduct drills and exercises designed to realistically test aspects of the plan. If timed properly and COOP program management begins no later than May 17, training and testing can occur during the critical month of September.

References

ASIS International. (2007). *ASIS supports global efforts in ISO standardization*. Alexandria, VA: Author. Retrieved January 23, 2010 from http://www.asisonline.org/newsroom/pressReleases/102407ASIS_Standards.doc

Baird, C. E. (2008). *Reducing the effects of extended and disaster operations on employees and their families*. Emmitsburg, MD: National Fire Academy, Executive Fire Officer Program.

BSI Group. (2006). *Code of practice for business continuity management.* (BS-25999-1). London, UK: Author.

Cashen, K. M. (2006). *A compilation of necessary elements for a local government continuity of operations plan*. (Unpublished master's thesis). Naval Postgraduate School, Monterey, CA.

Clas, E. (2008). Business continuity plans: Key to being prepared for disaster. *Professional Safety*. *9,* 45-48.

CSA issues business continuity standard. (2009, January). *Professional Safety, 1*, 19.

Department of Homeland Security. (2008). *Continuity Planners Workshop: Student Manual* (B/E/L 550). Washington, DC: Federal Emergency Management Agency.

El Paso Emergency Management Office. (2005). *Emergency management plan for County of El Paso, cities of Anthony, Clint, El Paso, Horizon, Socorro, and Vinton.* El Paso, TX: Author.

Gallagher, M. (2003). *Business continuity management: How to protect your company from danger*. London, UK: Pearson Education, Ltd.

Government Accountability Office. (2007). *Continuity of operations: Selected agencies tested various capabilities during 2006 governmentwide exercise.* (GAO-08-185). Washington, DC: Author.

Government Accountability Office. (2005). *Continuity of operations: Agency plans have improved, but better oversight could assist agencies in preparing for emergencies*. (GAO-05-577). Washington, DC: Author.

Grimaldi, R. J. (2002). Why do business continuity plans fail? *Risk Management*. New York: Risk Insurance Management Society, Inc. Retrieved March 19, 2010 from http://www.rmmag.com/Magazine/PrintTemplate.cfm?AID=1483

Herzog, R. J. (2007). A model of natural disaster administration: Naming and framing theory and reality. *Administrative Theory & Praxis, 29*(4), 586-604.

IJet International. (2008). *2008 business resiliency survey results: An insider's look at the current state of risk management, continuity and resiliency in multinational organizations.* (July, 2008). Annapolis, MD: Author.

Institute for Continuity Management. (2008). *Professional practices for business continuity practitioners.* New York: Author.

International Association of Fire Chiefs. (2003). Performance of the fire service during the 2003 northeast blackout and the implications for critical infrastructure protection. (November, 2003). Fairfax, VA: Author.

Krajewski, L. J., Ritzman, L. P., & Malhotra, M. K. (2010). *Operations management: Processes and supply chains.* Upper Saddle River, NJ: Pearson.

Maryland Emergency Management Agency. (2005). *Preparing for an emergency: Continuity of operations (COOP) planning for public institutions.* Baltimore, MD: Author.

Massachusetts Department of Developmental Services. (2009). *Continuity of operations plan*. Boston, MA: Author.

Miami-Dade County Department of Emergency Management. (2010). *Continuity of operations plan (COOP) template.* Miami, FL: Author. Retrieved November 23, 2009 from http://www.miamidade.gov/oem/library/2010-coop_template.pdf

Murphy, B. L. (2006). Locating social capital in resilient community-level emergency management. *Natural Hazards, 41,* 297-315.

National Fire Protection Association. (2010*). Standard on disaster/emergency management and business continuity* programs (NFPA 1600). Quincy, MA: Author.

Nilsson, J., & Eriksson, K. (2008). The role of the individual – A key to learning in preparedness organizations. *Journal of Contingencies and Crisis Management, 16*(3), 135-142.

Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal of Physical Distribution & Logistics Management, 34*(5), 434-456. Retrieved November 18, 2009 from Emerald database.

Peterson, E. R. (2003). *Continuity of operations in the executive branch: Background and Issues for Congress* (CRS Report No. RL31857). Washington, DC: Congressional Research Service.

Public Records/Security-system Plan Act, 10 Fla. Stat. §§ 119.071 § 3 (2001).

Quarantelli, E. L. (1997). Ten criteria for evaluating the management of community disasters. *Disasters, 21*(1), 39-56.

San Luis Obispo Chamber of Commerce. (2009). *Business continuity planning for emergencies*. San Luis Obispo, CA: Author.

Seale, H., Leask, J., Po, K., & MacIntyre, C.R. (2009). "Will they just pack up and leave?" - Attitudes and intended behaviour of hospital health care workers during an influenza pandemic. *BMC Health Services* Research. *9(30),* 1-8.

Sheffi, Y. (2005). *The resilient enterprise: Overcoming vulnerability for competitive advantage*. Cambridge, MA: MIT Press.

Taleb, N. N. (2008). *The black swan: The impact of the highly improbable*. New York: Random House.

Tarra, S. P. (2008). *Investment adviser business continuity planning: Turning compliance and readiness into competitive advantage.* Laguna Hills, CA: Financial Registrations, Inc. Retrieved January 30, 2010 from http://www.financialregistrations.com/inc/media/FRClientAdvisory68-IABusinessContinuityPlanning01032008ac2[IA-3].pdf

Taylor, K. B. (2008). *Enhancing the capability of Beckley Fire Department through continuity of operations planning.* Emmitsburg, MD: National Fire Academy, Executive Fire Officer Program.

United States Department of Homeland Security. (2009). *Continuity guidance circular 1: Continuity guidance for non-federal entities.* (CGC 1). Washington, DC: Author.

United States Department of Homeland Security. (2009). *Introduction to continuity of operations planning for pandemic influenzas.* (IS-520). Washington, DC: Author. Retrieved January 6, 2010 from http://emilms.fema.gov/IS520/PAN01summary.htm

United States Department of Homeland Security. (2009). *National infrastructure protection plan: Preparing to enhance protection and resiliency.* Washington, DC: Author.

United States Department of Homeland Security. (2008). *Federal continuity directive 1.* (FCD 1). Washington, DC: Author.

United States Department of Homeland Security. (2007). *Homeland security exercise and evaluation website*. Washington, DC: Author. Retrieved March 3, 2010 from: https://hseep.dhs.gov/pages/1001_About.aspx#HSEEPOverview

United States Fire Administration. (2010). [National fire department census]. Unpublished raw data. Retrieved February 27, 2010 from http://www.usfa.dhs.gov/applications/census/

United States Fire Administration. (2009). *Executive Fire Officer Program: Applied research guidelines*. Emmitsburg, MD: Author.

United States Fire Administration. (2008). *Special report: Fire department preparedness for extreme weather emergencies and natural disasters.* (USFA-TR-162). Emmitsburg, MD: Author.

United States Senate Committee on Homeland Security and Governmental Affairs. (2006). *Hurricane Katrina: A national still unprepared* (Senate Report No. 109-322). Washington, DC: U.S. Government Printing Office.

Appendix A: Business Continuity Planning Web Sites

http://www.business-continuity-world.com

http://www.thebci.org

http://www.continuitycentral.com

http://www.drj.com

http://www.disasterrecoveryworld.com

http://disasterrecovery.org

http://contingencyplanning.com

http://www.businessresiliency.com

https://www.drii.org/index.php

Appendix B: Internal On-line Questionnaire

1. Continuity of Operations Survey Questions

Thank you for your participation in this survey. Your answers will be kept confidential. If you would like survey results sent to you, please email CalderazzoMV@elpasotexas.

*** 1. Please indicate what general area of responsibility you are assigned to in the Fire Department (select only one).**

◯ Operations (emergency response) ◯ Communications ◯ Logistics ◯ Fire Prevention ◯ Administration ◯ Training ◯ Other

*** 2. I am:**

◯ a non-uniformed/civil service employee

◯ a uniformed/collective bargaining agreement employee

3. If you are a uniformed employee, please indicate your rank. All others please skip to question 4.

◯ FS 1-3 (not an officer)

◯ FS 4-5 (company officer)

◯ FS 6 and above (chief officer)

*** 4. During a community-wide crisis, I expect to be called in to work regardless of my regular work schedule.**

◯ True

◯ False

*** 5. I have read the El Paso County Emergency Response Plan.**

◯ True

◯ False

*** 6. I understand my role or function during an emergency under the El Paso County Emergency Response Plan.**

◯ True

◯ False

◯ I don't think I have a role or function under the plan

* **7. I have read the El Paso Fire Department's Continuity of Operations Plan (COOP).**

  ◯ True

  ◯ False

* **8. My immediate family and I have developed a family disaster plan.**

  ◯ True

  ◯ False

* **9. My family and I have practiced our family disaster plan.**

  ◯ True

  ◯ False

  ◯ N/A

* **10. Please indicate the likeliest source of information you would expect to receive employment-related information while off-duty during a community-wide disaster or emergency (1 = most likely source, 5 = least likely source).**

	1	2	3	4	5
my immediate supervisor	◯	◯	◯	◯	◯
any on-duty supervisor	◯	◯	◯	◯	◯
a co-worker	◯	◯	◯	◯	◯
the news media	◯	◯	◯	◯	◯
department automated notification system	◯	◯	◯	◯	◯

Appendix C: Largest Texas Fire Departments and Contacts

Table 1C

Fire Dept Name	Email Contact	Number Of Stations	Total Staff
Houston Fire Department	daniel.snell@cityofhouston.net	91	4282
Dallas Fire Department	openrecords@dallascityhall.com	55	2030
San Antonio Fire Department	deborah.foster@sanantonio.gov	50	1729
Austin Fire Department	michelle.decrane@ci.austin.tx.us	42	1100
Fort Worth Fire Department	FWFire@FortWorthGov.org	40	920
El Paso Fire Department	Not polled	34	880
Corpus Christi Fire Department	MHernandez@cctexas.com	17	434
Laredo Fire Department	dpiton@ci.laredo.tx.us	14	367
Plano Fire Department	hugoe@plano.gov	11	333
Lubbock Fire Department	lsmith@mylubbock.us	15	319
Irving Fire Department	rwilson@cityofirving.org	11	298
Arlington Texas Fire Department	fire@arlingtontx.gov	16	301
Garland Fire Department	dgrammer@ci.garland.tx.us	9	251
Beaumont Fire/ Rescue Services	Dcross@ci.beaumont.tx.us	12	234
Amarillo Fire Department	monty.owens@amarillo.gov	10	255
Mesquite Fire Department	mkerby@mesquitefire.org	7	207
Midland Fire Department 1	fireinfo@midlandtexas.gov	9	198
Brownsville Fire Department	Department website used	9	197
Grand Prairie Fire Department	cnelson@gptx.org	9	198
Waco Fire Department		14	185

Fire Dept Name	Email Contact	Number Of Stations	Total Staff
Abilene Fire Department	abifire@abilenetx.com	8	178
Dallas Fort Worth Intl Airport Fire Services	firemarshal@dfwairport.com	5	174
Odessa Fire Department	ofd@odessa-tx.gov	8	171
Longview Fire Department	krennick@ci.longview.tx.us	8	167
Refinery Terminal Fire Company		7	161
Wichita Falls Fire Department	earl.foster@wichitafallstx.gov	8	156
Richardson Fire Department	ed.hotz@cor.gov	6	150
McKinney Fire Department	mwallace@mckinneytexas.org	7	161
McAllen Fire Department	Department website used	6	154
Denton Fire Department	Michael.Penaluna@cityofdenton.com	6	155
San Angelo Fire Department	briand@safiredept.com	7	144
Carrollton Fire Department	Department website used	7	143
Frisco Fire Department	FireChief@FriscoFire.com	6	388
Texas Forest Service	joverhouse@tfs.tamu.edu	37	187
Killeen Fire Department Station Central	jgardner@ci.killeen.tx.us	7	157
Tyler Fire Department	Department website used	9	131
Lewisville Fire Department	rlasky@cityoflewisville.com	7	150
Round Rock Fire Department	lhodge@round-rock.tx.us	7	126
College Station Fire Department		5	129
Bryan Fire Department	fireservicesweb@bryantx.gov	4	119
Harlingen Fire Department	mrinaldi@myharlingen.us	7	112
Victoria Fire	vriley@victoriatx.org	4	110

Fire Dept Name	Email Contact	Number Of Stations	Total Staff
Department			
Port Arthur Fire Department	lrichard@portarthur.com	8	107
Galveston Fire Department	Varelamik@cityofgalveston.org	6	105
The Woodlands Fire Department	Department website used	6	121
Sugar Land Fire Department	fire@sugarlandtx.gov	6	108
Temple Fire & Rescue	lwallace@ci.temple.tx.us	7	101

Appendix D: Fire Department COOP Questionnaire

1. Default Section

Hi. My name is Michael Calderazzo and I am a participant in the National Fire Academy's Executive Fire Officer Program. I am presently working on a research paper involving Continuity of Operations Planning for fire departments. Your input in this survey is greatly appreciated and will assist me in this research. Your answers will be kept strictly confidential. However, if you would like a copy of the survey's results or a copy of my EFO paper, I will gladly provide those to you. Just send your request to CalderazzoMV@elpasotexas.gov.

* **1. What type of agency is your fire department?**

- ◯ paid
- ◯ volunteer
- ◯ combination

* **2. What is the average size of the population your agency serves?**

- ☐ <50,000
- ☐ 50,000 - 100,000
- ☐ 100,000 - 500,000
- ☐ 500,000 - 1,000,000
- ☐ >1,000,000

* **3. How large is your agency in terms of total authorized staffing (including non-uniformed)?**

- ◯ <100
- ◯ 100-250
- ◯ 250-500
- ◯ 500-1000
- ◯ >1000

* **4. Does your agency have its own Continuity of Operations Plan(COOP)? If yes, please answer questions 5-10. If no, please skip the remainder of the survey and click 'done.'**

- ◯ Yes
- ◯ No

5. Do you have primary responsibility for the development of your agency's COOP?

- ◯ Yes
- ◯ No

6. Do you have primary responsibility for the maintenance of your agency's COOP?

- ◯ Yes
- ◯ No
- ◯ I don't know

7. Is a copy of your agency's COOP plan immediately available to all members of the organization?

- ◯ Yes
- ◯ No

8. Is there a regular process for COOP testing/evaluation?

- ◯ Yes
- ◯ No

9. Please mark all the features your COOP includes from the list below:

	Plan Item
Purpose/objective	☐
Applicability and scope	☐
Authority and references	☐
Implementation	☐
Emergency classification	☐
Orders of succession	☐
Essential functions	☐
Alternate operating locations	☐
Communications	☐
Records	☐
Financial management	☐
Security measures	☐
Dependent care	☐
Transportation/lodging/food	☐
Plan Testing	☐
Plan management/maintenance	☐

10. Would you share a copy of your agency's COOP with the El Paso Fire Department? If so, please provide us with your email address in the text box below, so we may contact you directly. Thank you!

Appendix E: COOP Development Project Timeline and Gantt Chart

	Name	Duration	Start	Finish	Predec...	Resource Names
1	Assign Continuity Program Manager	1 day	5/17/10 8:00...	5/17/10 5:00 PM		
2	Form Continuity Planning Team	4 days	5/18/10 8:00...	5/21/10 5:00 PM	1	Program Manager
3	DevelopObjectives/Budget/Timeline	7 days	5/24/10 8:00...	6/1/10 5:00 PM	2	Continuity Team
4	Obtain Approval From Managment	1 day	6/2/10 8:00 AM	6/2/10 5:00 PM	3	Program Manager
5	Define Essential Functions	3 days	6/3/10 8:00 AM	6/7/10 5:00 PM	4	OperationsSubcommittee
6	Conduct Risk Assessment	5 days	6/8/10 8:00 AM	6/14/10 5:00 PM	5	Risk Analysis Subcommittee
7	Perform Business Impact Analysis	5 days	6/15/10 8:00...	6/21/10 5:00 PM	6	Risk Analysis Subcommittee
8	Identify Key Personnel	2 days	6/8/10 8:00 AM	6/9/10 5:00 PM	5	OperationsSubcommittee
9	Prepare Succession Plan	1 day	6/10/10 8:00...	6/10/10 5:00 PM	8	OperationsSubcommittee
10	Identify Vital Records	3 days	6/22/10 8:00...	6/24/10 5:00 PM	7	ResourcesSubcommittee
11	Prepare Critical Equipment List	2 days	6/8/10 8:00 AM	6/9/10 5:00 PM	5	ResourcesSubcommittee
12	Identify Alternate Facilities	4 days	6/10/10 8:00...	6/15/10 5:00 PM	11	ResourcesSubcommittee
13	Interoperable Communications	7 days	6/16/10 8:00...	6/24/10 5:00 PM	12	ResourcesSubcommittee
14	Human Capital Issues	10 days	6/25/10 8:00...	7/8/10 5:00 PM	9;10;12	OperationsSubcommittee
15	Implementation Plan	5 days	7/9/10 8:00 AM	7/15/10 5:00 PM	14	EditorialSubcommittee
16	Public Relations Plan	1 day	7/16/10 8:00...	7/16/10 5:00 PM	13;15	OperationsSubcommittee
17	Security Plan	2 days	7/9/10 8:00 AM	7/12/10 5:00 PM	14	ResourcesSubcommittee
18	Resource and Logistics Issues	5 days	7/19/10 8:00...	7/23/10 5:00 PM	16;17	ResourcesSubcommittee
19	Training, Testing and Evaluation Plan	10 days	7/26/10 8:00...	8/6/10 5:00 PM	18	OperationsSubcommittee
20	Program Maintenance and Assignments	1 day	8/9/10 8:00 AM	8/9/10 5:00 PM	19	OperationsSubcommittee
21	Publish Plan	14 days	8/10/10 8:00...	8/27/10 5:00 PM	20	EditorialSubcommittee
22	Distribute Plan	7 days	8/30/10 8:00...	9/7/10 5:00 PM	21	Program Manager
23	Conduct Training	30 days	8/30/10 8:00...	10/8/10 5:00 PM	21	Continuity Team
24	Exercise Program	3 days	9/28/10 8:00...	9/30/10 5:00 PM	22	Program Manager
25	Conduct Annual Audit	5 days	10/1/10 8:00...	10/7/10 5:00 PM	24	Program Manager
26	Analyze Audit Results and Prepare Recommendations	5 days	10/8/10 8:00...	10/14/10 5:00 PM	25	EditorialSubcommittee
27	Revise Plan	2 days	10/15/10 8:0...	10/18/10 5:00 PM	26	EditorialSubcommittee

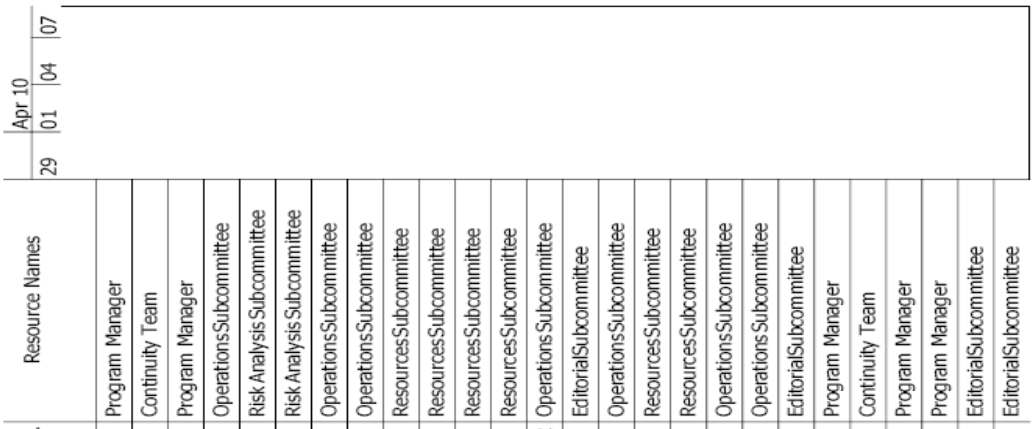
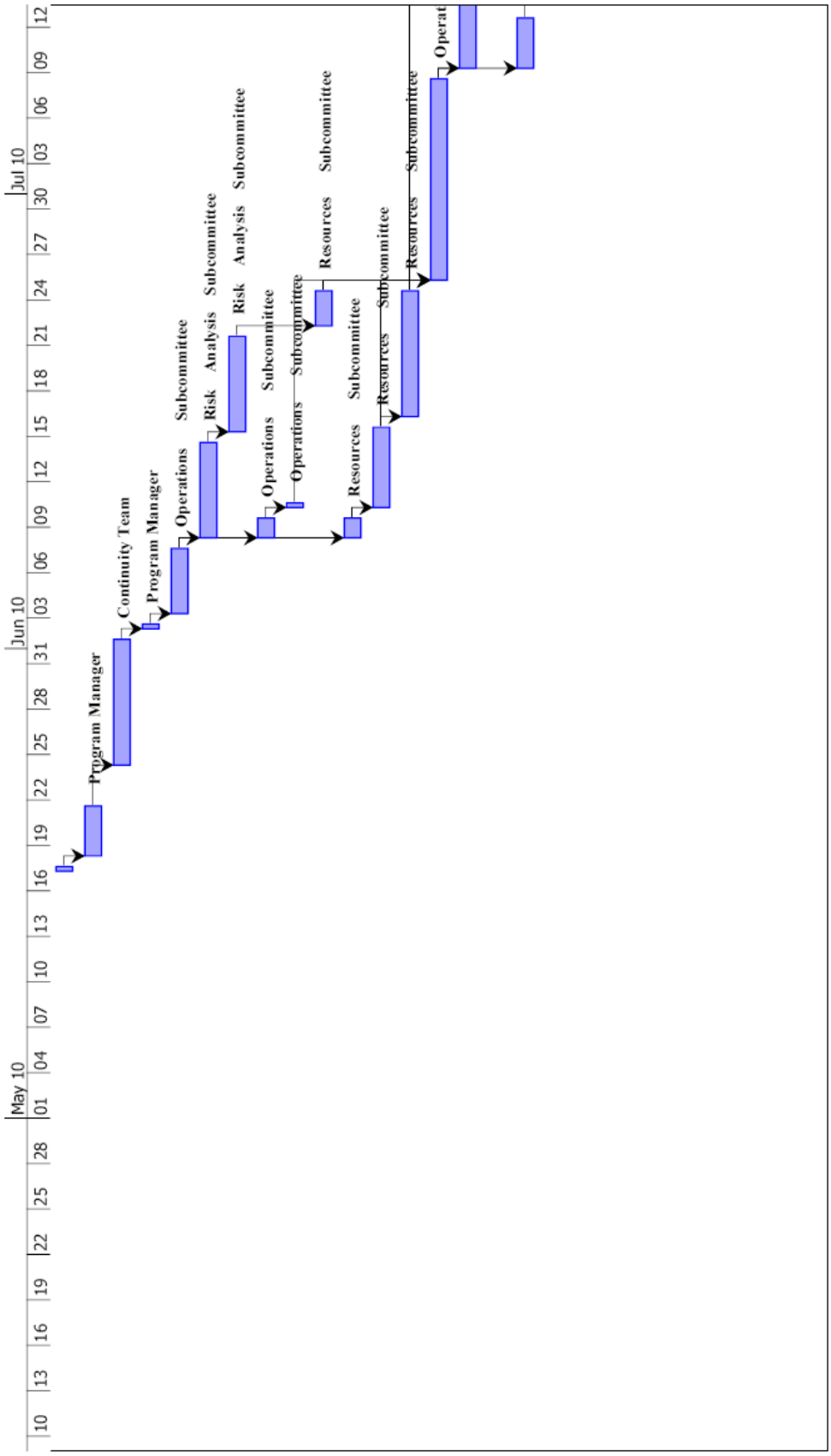
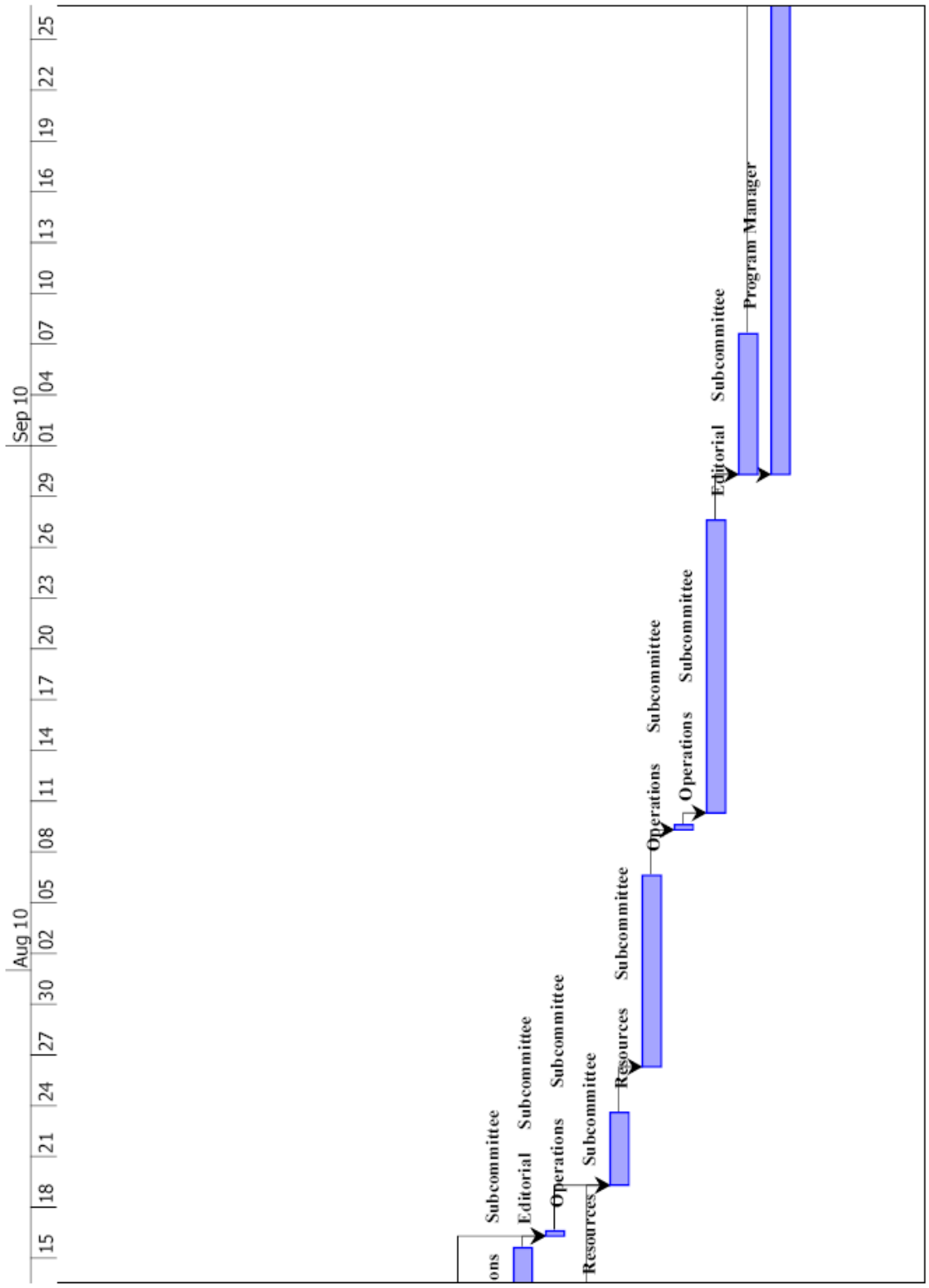


Figure 1E. COOP planning project management timeline and Gantt chart.


May 10
Jun 10
Jul 10
Program Manager
Continuity Team
Program Manager
Operations Subcommittee
Risk Analysis Subcommittee
Operations Subcommittee
Risk Analysis Subcommittee
Operations Subcommittee
Resources Subcommittee
Resources Subcommittee
Resources Subcommittee
Operat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Subcommittee
Editorial
Subcommittee
Program Manager