

Information Collection Assessment Team
(ICAT)

ICAT Chile

After Action Report

Chile Earthquake



Event Date: February 27, 2010

Travel Date: May 30, 2010 - June 4, 2010



FORWARD

We would like to extend a special thank you to the following people for their contributions. Without their assistance and support, our team and trip would not have been as successful.

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Executive Summary

On February 27, 2010, at 03:34 GMT/UTC -04:00, a magnitude 8.8 earthquake lasting three minutes struck the coast of the Maule Region of Chile. It was felt in six regions in Chile and as far as 1,500 miles away in the Country of Peru. The earthquake caused a power failure that affected 93 percent of the country's population and lasted several days in some locations.

The earthquake and resulting tsunamis killed more than 500 people, directly impacted approximately 2 million persons, and left over 500,000 houses uninhabitable. In addition, the earthquake triggered a Pacific-wide tsunami threat which caused damage as far away as the California coastline.

The earthquake was caused by the subduction of the Nazca plate beneath the South American plate, an area known for causing mega earthquakes such as the 1960 Valdivia earthquake and the 2007 Antofagasta earthquake in northern Chile. Researchers using GPS have scientific data indicating the earthquake shifted Santiago 11 inches (28 cm) to the west-southwest and moved Concepción at least 10 feet (3 meters) to the west.



On May 28, 2010, the Los Angeles Operational Area (LAOA) Alliance dispatched a team to observe, gather and analyze information pertaining to preparedness, planning, response, and recovery efforts in Chile. The observations and data obtained by traveling to areas that have sustained significant damage as a result of a catastrophic incident provide valuable information that can be utilized by the LAOA and its regional partners, relative to all phases of disaster response and recovery.

This After Action Report (AAR) summarizes the lessons learned during and after the earthquake, serves as a reference for local emergency disaster planners, and makes recommendations for improvement here in the LAOA based on observations and analysis of data collected in Chile.

The suggested actions in this report should be viewed as recommendations only. Each agency should review the recommendations and determine the most appropriate action and the time needed for implementation.



ICAT Mission

Through the efforts of the Federal Emergency Management Agency (FEMA) and funding from the Regional Catastrophic Planning Grant Program (RCPGP), an Information Collection & Assessment Team (ICAT) comprised of emergency planners, first responders, mental health, and sheltering experts, traveled to Chile from May 30 to June 4, 2010 to gather and analyze information on the planning, response, and recovery efforts in place before and after the February 27, 2010 earthquake. ICAT members are not part of the response/recovery effort of the incident but function strictly to observe, document, and discuss processes and procedures.

The overall goal of ICAT was to:

- Review and evaluate policy and procedures at the local, regional and federal levels
- Obtain formal and informal briefings from first responders, government and private agencies
- Observe the recovery efforts
- Identify lessons learned
- Provide recommendations to improve, develop or modify existing plans

The observation and data collection process included the following areas:

- Pre-Mitigation Strategies and Planning
- Chain of Events/Timelines
- Effects of Infrastructure Damage
- Current vs. Past Building Codes and Damage Assessment
- Mass Evacuation, Care & Sheltering Operations
- Reception, Recovery and Re-Entry Operations/Strategies
- Access and Functional Needs (AFN) Assistance and Strategies
- Psychosocial Issues
- Temporary, Interim, and Long Term Housing Issues
- Donation and Volunteer Management Strategies
- Local, Regional, and State Mutual Aid Processes

This information will be used in the development of regional catastrophic planning for the Los Angeles, Ventura, Riverside, Orange, and San Bernardino Counties (Los Angeles Region). Currently, the Alliance is funded through the Urban Areas Security Initiative (UASI) and RCPGP.

ICAT was hosted by the Chilean Fire Department and Chilean Consulate. The Fire Department provided interpreters to facilitate dialogue and transportation services to the affected areas. ICAT members met with local and state representatives from law, fire, health, Red Cross, state emergency management, and Chile's National Emergency Office (ONEMI), the office responsible for managing and coordinating the first response to large scale emergencies.



Chile ICAT Analysis Summary

ICAT collected and analyzed data from sources internal to the Chilean Government as well as non-governmental organizations (NGOs) and public-private organizations. For the purpose of the AAR, ICAT focused on several issues of particular interest to the LAOA and its regional partners. Those issues, with recommendations and options for consideration, are discussed in further detail below.

Communications

Chilean officials identified communications system stability and reliability as the priority improvement needed for the country's emergency management. Following the earthquake, communication was a significant problem across several dimensions. The emergency communications system failed at the local, state, and national level and was not restored for days. Even Chile's National Emergency Office (ONEMI) only had High Frequency (HF) and Ultra High Frequency (UHF) system capabilities following the earthquake. There was no communication between communities, first responders and much of the population. In general, landlines and cell phones were down, with only satellite phones and amateur (HAM) radios working. This made it difficult for public agencies to obtain timely and accurate information on the status and damage caused by the earthquake.

Although Chilean law enforcement had a technologically advanced communications system, it failed due to damaged repeater sites and power failure. The lack of communication led authorities to decline initial offers of foreign aid and to delays in dispatching troops to quell incidences of looting. The communications system failure also adversely impacted public information announcements to the citizens of Chile.

One of the main sources of information, however, was the local radio station. Personnel who were not at work at the time of the earthquake knew the importance of their facility and its capabilities, and immediately reported to the radio station to ensure continued transmission after the earthquake. They were able to broadcast 25 minutes after the earthquake due to their earthquake preparedness and immediate access to communications systems and air transportation assets. Local media had timely access to private aircraft which allowed them to fly in and out of the affected area and broadcast situational information throughout the country via the local radio station. The radio station became an important part of public information dissemination but was not necessarily recognized beforehand as an integral part of emergency management.

Wireless service providers reported that several cellular towers had collapsed, which reduced available wireless signal and capacity resulting in network overload. However, wireless internet access was available in several areas throughout Chile, enabling some rescue teams to communicate with international and local aid groups via the use of social networking.

HAM radio also played a large role in bridging the communication failures. Officials described "silent areas" where no communication had been established for days following



the earthquake. The HAM radio operators who were dispersed throughout the country provided a critical lifeline by making contact with these areas until emergency communications systems were restored. As communications became available, the Police Department also helped establish communication by allowing the community to make free calls to family members, but according to the Constiucion Fire Department, full interagency communication did not become operational for 2.5 weeks after the earthquake.

In response to the communications system failures that took place following the earthquake, Chile's ambulance system (SAMU) is currently looking for a centralized "emergency call" dispatch line. SAMU is linked to the Fire Department and the Police Department, but there are currently three separate lines to request service from each entity.

Lessons Learned

The importance of telecommunications was a primary issue of concern following the earthquake in Chile. Following a catastrophic earthquake, communications failure may impact local or larger areas. It is safe to assume that telephone service will be disrupted, as well as wired internet access through telephone companies or cable television providers.

Emergency operations centers that lose connectivity to vital communications systems may not be able to move to alternate locations where full or even partial services can be restored. Loss of connectivity will severely hinder the ability to effectively manage a catastrophic disaster. A robust communications infrastructure, including redundancy and interoperability, will save time and money, reduce panic, enhance situational awareness, and limit loss of life, property, and infrastructure after a catastrophic disaster. Emphasis should be on employing the best available technology and people trained to use it. Equipment, methodologies, techniques, and procedures for communications must be tested, maintained and operated, not just during crisis, but on a continual basis, or they may fail when needed most.

Recommendations for the Los Angeles Region

- Ensure redundancy of critical communications facilities
- Build communication failure protocols into emergency response plans
- Develop a yearly comprehensive exercise, including integrated fallback procedures for catastrophic communications system failure (local, regional and state)
- Expand the number of rapid response mobile communication vehicle platforms, such as the Department of Homeland Security/Los Angeles Police Department Archangel Vehicles
- Have a sufficient number of satellite phones deployed daily with first responder agencies
- Consider expanding the HAM radio program
- Ensure public alert notifications are able to be delivered during a catastrophic communications system failure
- Obtain portable repeater systems
- Pre-position mobile assets throughout the region for rapid replacement communications systems



- Cross-train regional partners and stakeholders on strategic/critical communications systems
- Enhance local government's use of radio and social media outlets.

Structural Impact

Chile is located in a highly seismic region. As a result, Chile has placed a great deal of planning into its building codes, which were last updated in 2003. Today, it is estimated that approximately 97 percent of recently built buildings, including “essential” facilities are up to the current building code.

The most predominant construction type found throughout Chile is masonry. The majority of the structures that collapsed had older construction standards such as unreinforced masonry and adobe construction. Adobe construction severely hampered rescue efforts as trapped victims did not have sufficient void space to prolong life long enough for search and rescue team assistance.



For high-rise apartments, contractors typically use concrete, and 33 percent of commercial buildings are built using reinforced concrete. Residential construction types are based on wood frames. Steel construction is used in about 15 percent of commercial structures. Industrial buildings are typically built using steel or light metal.

Chile's building codes, set by the National Institute of Normalization in 1996, are similar to building codes used in the United States. Additionally, Chile has a peer review system conducted by recognized experts in seismic design, which was established in 2003. This process is somewhat similar to plan check review in the United States, with one notable difference – Chile does not require independent construction inspections. Construction observation and testing are performed as part of the building contractor's services. Therefore, the contractors are solely responsible for ensuring they meet the building standards.

Few catastrophic failures of tall buildings occurred in the Chile earthquake. In Concepcion, two notable failures occurred: the 15-story Alto Rio residential building and the 21-story Torre O'Higgins Office Building. The Alto Rio building suffered damage most likely attributed to excessive compression on lower walls, coupled with insufficient tension capacity. In the Torre O'Higgins building, failure occurred in the upper part of the building above the tenth floor. The probable cause was the structural modification of the building by a tenant. Despite these few instances, most of Chile's tall buildings performed well.

In the aftermath of the earthquake, a Joint Incident Command structure with the Police and Fire Departments, NGOs and Chile's ambulance system (SAMU) conducted building evaluations, in Concepcion, to determine if they were inhabitable, in need of repair, or required demolishing. Similarly, firefighters in Constitucion performed all safety inspections



and damage assessments of residential and commercial property as a requirement of the insurance companies.

Total Building Damage Estimates to date:

- 500,000 structures damaged (could rise as high as 1.5 million)
- 43 fire stations destroyed, 209 fire stations damaged
- 67 police stations destroyed, 227 police stations damaged
- 5 hospitals collapsed, 130 moderately to severely damage (4,731 of the 26,000 beds out of service)
- 1,019 of the 4,432 schools were damaged beyond repair, 631 damaged and operationally impacted

Recommendations for the Los Angeles Region

- Conduct a structural review of older, first responder facilities and their supporting infrastructure
- Develop and exercise a plan for first responders and stakeholders that tests safety plans and preparedness
- Conduct regular and frequent “drop, cover & hold” shakeout drills
- Coordinate an exercise for secondary or fall back facilities (COOP/COG)
- Conduct yearly tall-building evacuation exercises for management and on-site staff
- Develop public education programs that drive interest and commitment

Infrastructure Impact

The earthquake caused significant damage to Chile’s infrastructure. After the event, structural experts from the Chilean Government were dispatched to inspect and evaluate the seismic performance of bridges, roads and railroads. Evaluation of this infrastructure required covering a large area (approximately 372 miles x 62 miles), including several regions and metropolitan areas of Chile.

Major damage or interruption occurred in the following areas:

- North-south Pan American Highway
- Airport – Concepcion and Santiago
- Critical overpasses and bridges
- Water system
- Power generation
- Chemical plant

The earthquake severely impacted the transportation infrastructure across Chile. Hundreds of roads buckled along with the collapse of several key bridges and overpasses. Major damage was also reported along Chile’s only major highway, the north-south Pan American Highway. Significant damage occurred on the highway between Santiago and Temuco, which hindered and delayed relief and rescue efforts to the hardest-hit coastal cities. Large



amounts of debris on the highway and roads prevented the passage of large vehicles needed to deliver supplies and continue commerce.

A total of eleven pedestrian bridges were damaged along the Santiago-Los Vilos stretch, including a collapse along the Claro River. Chilean officials noted that, because the earthquake struck in the overnight hours, the number of casualties was minimized due to a lack of traffic on the roads. During the daylight hours, the north-south Pan American Highway is normally bustling with traffic. The Vespucio Norte Express highway had several spans of the overpass collapse when they pulled or flexed away from the upright supports, resulting in 22 deaths and the temporary loss of a major thoroughfare for the Capital City of Santiago. As a result, the Chilean Government is analyzing the need for another cross-country travel route to minimize future highway vulnerabilities.

The Arturo Merino Benitez International Airport located in Santiago, which is 200 miles from the earthquake's epicenter, was immediately closed due to heavy damage to the terminals and moderate damage to the runways. The closure lasted approximately three days; however, half of the airport remained closed for two weeks. The main runway was unaffected. Planes were limited only to arrivals for the first four days after the earthquake. In the town of Constitucion, the town's municipal airport was flooded by the tsunami. Chile has a robust rapid-transit system, similar to the United States, consisting of the subway system (in the major cities), bus routes, and other public transportation, most of which was closed until inspections were conducted. The transit system reopened on March 1, 2010.

Ports are essential facilities for the Chilean economy as they carry more than 90 percent of the country's imports and exports. Damage did occur at Chile's main shipping ports. The country's primary port located in Valparaiso was ordered closed due to significant damage caused by liquefaction and lateral spreading, and resumed limited operations on February 28th. The port in Talcahuano was also severely damaged by the tsunami. In the port city of San Antonio, the port suffered minor damage and was closed for four days before undamaged sections were allowed to reopen. Chilean shipping interests were forced to detour to other ports north of the epicenter.

As expected with any major earthquake, widespread power outages occurred. Power companies reported that over two million homes lost electricity. Moreover, fuel pumps in Chile operate electronically. Power failures adversely impacted the availability of fuel and limited the use of vehicles for evacuation purposes. However, the power companies' response was swift and electricity was restored to the majority of the region within five days. Electrical production companies reported that generation units were temporarily shut down due to minor damage. Overall, approximately 17 percent of total capacity (or 545 megawatts) of power generation was shut down immediately following the earthquake.

Local domestic water supply and hydrant systems feed off a single main system, similar to the Los Angeles water distribution system. The damaged water system significantly and adversely impacted the firefighting effort and also limited water availability for consumption.



Lessons Learned

In Chile, most major expressways have been widened to include a newer bridge erected alongside an older preexisting bridge. In many cases, the newer bridges with poor seismic details collapsed. The older bridges that collapsed did so because they slid off of the columns and abutments that supported them. Seldom did both bridges collapse. However, we did see many metal plates and other “bridging” structures used to shore up the gaps temporarily until repairs could be made. The Chileans believed that the structural integrity of their roadways was similar to their buildings and they would survive a powerful earthquake. This proved to be accurate in many cases.

Chile did not appear to have a formal evacuation plan or a process of evacuation which would have included a transportation infrastructure assessment and a robust traffic plan. Traffic plans should not only look at capacity and flow, but also evaluate the strength and resiliency of the overpasses, bridges and roadways. When bridges and roadways failed, it seriously hampered the ability for responders to get to the affected areas. Roadways throughout held up well; however preparation, including traffic routes and diversion plans, need to be developed in the event of catastrophic roadway system failure. Aside from life sustaining infrastructure, transportation infrastructure is the next most critical issue following a catastrophic earthquake.

The 1994 Northridge earthquake, which at a magnitude 6.8 was considerably smaller in intensity than the Chile earthquake, caused damage to 233 state highway bridge overpasses. Portions of major highways and freeways in California were closed due to the extensive damage or failure of bridges, inducing widespread disruption after the event. Significant travel delays and associated business interruption and economic loss were reported until bridges were reopened. The entire City of Los Angeles suffered a blackout, and approximately 15 percent of the population (about 100,000 customers) served by Los Angeles Department of Water and Power (LADWP) lost water services immediately following the earthquake.

In any area, water and power and basic lifeline services need to be reestablished as quickly as possible after a catastrophic event. However, a priority and focus must be in reestablishing key roadway arteries, through debris removal and or repair, as quickly as possible so emergency responders and stakeholders have access to impacted areas to save lives, effect repairs, restore utilities, and maintain order.

The public must have confidence that their government is responding quickly to a crisis, and addressing restricted roadway access and wide-spread communications failures immediately is a way for government to build that confidence. Identification, assessment and impact prediction on all life-sustaining infrastructure and roadways should occur on an ongoing basis.

Recommendations for the Los Angeles Region

- Develop a model to assess the seismic performance of interdependent/dependent critical infrastructure systems and re-locate out of potential tsunami flood zones



- Develop a Rapid Response Organized Assessment and Repair (RROAR) teams to respond quickly to repair damaged critical infrastructure.
- Develop a regional catastrophic earthquake work group with strategic stakeholders
- Assess airport runways at major airports to determine the impact a large earthquake would have, and develop RROAR capabilities
- Pre-stage heavy equipment (e.g., bull dozers, dump trucks, cranes) in safe zones near predicted roadway/highway failure points
- Assess possible impact to first responder, emergency management and key government members' ability to respond and/or report for duty in a catastrophic event
- Conduct real-time rapid response runway repair drills at major airports
- Develop comprehensive port design code, including requirements for port evacuation following a major earthquake
- Integrate all port and airport emergency plans with local and regional emergency management and first responder agencies to include exercises and drills

Public Safety and Security

Following the initial earthquake, thousands of looters took to the streets in the City of Concepcion and began ransacking clothing boutiques, grocery stores, electronic stores, and ATMs. Some looters focused on food and water and other life-sustaining products as a result of the complete loss of utilities, while others focused on nonessential material goods.

In several communities, neither inherent crime rate nor poverty of the area contributed to the looting. It would appear that the looting became contagious and was not based on any particular demographic. The media, in fact, was blamed for inflaming and magnifying the situation, fueling people's fears and anxieties about needed supplies.

A large percentage of the structure fires that burned in the Concepcion were intentionally set by the looters in an attempt to cover their tracks or divert first responder resources away from target locations. Lack of water hampered the firefighters from extinguishing the fires. In some instances, drivers of fire apparatus were stopped at gun point and the water was commandeered due to the lack of available potable water. When attempts were made by firefighters to utilize the water to fight the fires, looters who had armed themselves with handguns began shooting at the firefighters, forcing firefighters to flee to safety. On several occasions the firefighters fought fires while their police escorts actively engaged looters in gun battles to provide force protection.

When firefighters began responding to assess the area, they were stopped by citizens requesting rescue of victims who were trapped in the rubble of collapsed buildings. This became an overwhelming issue for the responders, due to the sheer number of citizens stopping them to conduct rescues. Firefighters responding to structure fires that refused to stop for citizens reporting trapped victims were threatened with firearms and forced to begin rescues operations. This immediate demand for help and related threats caused firefighters to request police escorts while responding to fires, further straining the first responder resources.



When commercial stores and warehouses were emptied, looters turned their attention to the Port of Concepcion, where they looted products from storage bins damaged by tsunamis. Looting was also rampant in parts of Santiago, Chillan, and Talcahuano. Several fire stations were also looted while firefighters were out engaged in fire suppression. Looters smashed doors and windows gaining access, and removing food, water, firefighter's personal equipment and supplies, and station equipment.

The looting and subsequent armed assaults led to community vigilantism. Communities organized their neighborhoods to provide safety and security, walking foot patrols and fixing surveillance points, which kept the criminal element out of their respective neighborhoods. However, in one incident, one group of community vigilantes mistook an adjacent vigilante group as looters and an armed confrontation resulted.

Consequently, the Chilean Government declared a 'State of Catastrophe', instituted a dusk-to-dawn curfew, and sent several thousand troops into the impacted areas to assist the police in restoring order. The government initially delayed this deployment due to the stigma created by the past military government. When the military arrived, approximately four days after the earthquake, they were not able to suppress the looting and armed attacks, due in part to continued aftershocks, some as strong as magnitude 6.9, which renewed panic. This prompted the extension of the curfew from 12 hours to 19 hours per day until the situation was controlled. However, as the military left, a feeling of insecurity surfaced in many communities. This resulted in a deployment of the Police and created a resource issue in most regions.

Officials advised that they conduct door-to-door searches of city residents which resulted in the recovery of over \$1.03 billion Chilean Pesos (USD \$2.0 million) in stolen goods. The police also used their mobile phone cameras to photograph looters in the act. They later used these images to identify looters and to begin prosecution procedures. The Police Department's decision to not intervene immediately was designed to avoid use of force or lethal force, to deploy their resources more effectively in rescue operations and general public safety, and to preserve the positive image they held in the community. Their strategy proved effective. To date, over one million dollars worth of merchandise has been recovered or returned by those wishing to avoid prosecution.

Lessons Learned

Looting can be contagious, stimulating those who would not otherwise participate in this behavior, to become mindlessly involved. Law enforcement response should be decisive and swift, establishing a zero-tolerance posture, noting that personnel resources will already be thin.

Law enforcement faced a severe challenge in dealing with the looters while simultaneously having to provide police escorts for the firefighters. They were also challenged in providing an adequate level of protection to prevent citizens from forming community vigilante groups, which created its own set of problems.



Recommendations for the Los Angeles Region

- Develop strategically placed Points of Distribution (POD) for first responder equipment and supplies
- Increase number of local and regional Urban Search and Rescue (USAR) trained personnel
- Establish security details consisting of law enforcement personnel to safeguard critical facilities, including fire stations and ports, to prevent looting of these facilities
- Establish PODs for water distribution to the public
- Ensure correct and consistent public messaging and public messaging for water PODs locations

Community Preparedness

Chile conducts advance planning for earthquakes, which primarily includes training drills, public awareness, and behavioral response to an earthquake as an integral part of adult and child education.

Lessons Learned

Emergency planners in the United States have educated the public to prepare for three days without food, water or utilities. Given the fragile state of our basic infrastructure services (e.g. water, power, roadways), it would be prudent to expand this expectation to a minimum of seven days. Public education is critical in the preparedness planning cycle to ensure mental preparedness as well as physical preparedness.

Recommendations for the Los Angeles Region

- Develop a public education campaign to educate the public on expectations and effects from a catastrophic earthquake
- Increase public earthquake preparedness from three days to seven days
- Install and utilize a tsunami warning system in all coastal areas
- Conduct community-based training drills

Emergency Planning

One of the main objectives of the ICAT was to review and analyze the Chile earthquake planning and response and compare that to the planning and response in the LAOA. Given Chile's history of seismic activity, and experiencing two of the strongest earthquakes in modern history, we were interested to learn about and observe their planning, pre- and post-event. Throughout our travels in the impacted areas of the country we found that there were areas of strength, but also areas for improvement, which led ICAT to also look for areas for improvement in the Los Angeles Region.

A specific area for improvement focused on the reaction time for the initial warning by the central authorities to alert coastal populations of the impending tsunami and the time it took



for the initial distribution of essential supplies to get to the Chilean people. Evacuation protocols and related planning was another area for improvement, as Chile does not appear to have robust mass evacuation plans. According to the Chief of Police in Constitucion, there are now plans to create a mandatory evacuation order for coastal communities 25 kilometers above sea level and to designate and identify specific streets as safe evacuations routes.

Lessons Learned

Disaster preparedness planning involves identifying organizational resources, determining roles and responsibilities, developing policies and procedures, and planning activities in order to reach a level of preparedness to be able to respond timely and effectively to a disaster. Disaster planning is a dynamic process and not a one-time event. While a plan may detail specific objectives and preparedness



actions, these will need adjustments and refinement during an actual emergency as existing plans may not always capture critical elements or unforeseen circumstances. After a disaster occurs, plans must be evaluated and modified to meet the challenges of future catastrophic events.

During Chile's earthquake, or following any incident/event of significant magnitude, a wide range of critical decisions must be made in a very short period of time. Many things in pre-planning and response were done correctly. Public education saved lives as residents reacted as trained. At the time, this was the fifth largest earthquake ever recorded and the number of deaths suggests that Chile was well prepared.

Chile conducted three major evacuation exercises over a six-year period prior to the earthquake. The consistent messaging and training resulted in self-evacuation to high ground in the coastal community of Constitucion within minutes of the initial earthquake and in advance of five succeeding tsunamis.

Catastrophic numbers of fatalities were avoided in this event as a result of this critical lifesaving action. Local governments must prepare those who are expected to respond by ensuring Continuity of Operations/Continuity of Government (COOP/COG) planning has been done. Planning must set realistic work priorities and essential functions given the likelihood of the catastrophic incident/event impacting operational abilities, facilities, limiting equipment and supplies, and reducing workforce. Part of this must be the preparation and completion of comprehensive scenario-based strategic planning and plans to include:

- Evacuation
- Transportation and Reception
- Mass Care Sheltering (short & long term)



- Coordinated Rapid Catastrophic Incident/Event Response
- Large Scale Responder Security & Escort
- Responder Preparedness & Support
- Volunteer & Donation Management
- Points of Distribution (POD) (bulk commodities & medical)
- Fatality Management
- Recovery Planning and Strategy

These plans must be robust and continually reviewed, updated, automated, and available to those tasked with operational command and control of the incident, as well as those tasked with the responsibility of strategic management. Plans should be working documents subject to ongoing review, critique, and discussion by governing committees and public stakeholders. Disaster plans should be widely disseminated and communicated to members, headquarters offices and departments, NGOs, volunteers, and relevant external organizations.

A critical component of preparation is realistic scenario-based planning and ongoing training and exercising. Having scenario-based strategic planning with all stakeholders, including public, private, non-profit, and faith-based organizations, fosters a unified, coordinated, and informed disaster plan.

In a catastrophic disaster, outside aid will arrive eventually and resource management is critical. To successfully manage catastrophic incidents/events, the importance of Unified Command in the strategic and operational planning arena is critical. One of the major lessons learned from Chile and the events in our own country is that people become complacent in the face of predictable events. The Chile earthquake was predictable, as was Katrina, and yet no additional preparation, mitigation, or training occurred.

In the United States there has been an increase in disaster awareness, preparedness, and training since the terrorist attacks of 9/11 and Hurricane Katrina. Mandates have been established by federal and state agencies requiring local governments to utilize specific percentages of grant funds for training, preparedness, and mitigation efforts. There has been movement toward strategic planning and preparedness.

The process of formulating and updating specific objectives will require management and planners to communicate and coordinate their plans with those government agencies and NGOs at all levels involved in disaster response.

Through direct, clear, and concise coordination, agencies can divide responsibility for different operations and plan their actions accordingly. Similarly, representatives of various agencies working in one area (e.g., health, shelter and food distribution, public work, utilities, etc.) may organize planning subgroups. Joint development and updating of preparedness plans can serve as the basis for coordination among agencies and increase the use of the plan.



Recommendations for the Los Angeles Region

- Establish a federally funded pilot program utilizing local entities to develop regional catastrophic planning initiatives, programs, and best practices
- Conduct a scenario-based catastrophic disaster needs assessment and matrix
- Establish a plan review hierarchy for non-agency-specific plans i.e., emergency management departments having primary review, coordination and integration responsibility to include final approval of all catastrophic planning and plans
- Develop fully comprehensive catastrophic incident/event plans i.e.,:
 - COOP/COG
 - Evacuation
 - Transportation and Reception
 - Mass Care Sheltering (short & long term)
 - Tsunami Evacuation and Recovery
 - Coordinated Rapid Catastrophic Incident/Event Response
 - Large Scale Responder Security & Escort
 - Responder Preparedness & Support
 - Volunteer & Donation Management
 - Points of Distribution (bulk commodities & medical)
 - Fatality Management
 - Mental Health
- Ensure full integration of plans with the regional partners and stakeholders to include colleges and schools, correctional facilities, mental health professionals, medical facilities, and private sector stakeholders/partners
- Develop, establish, and conduct county and regional integrated stakeholder catastrophic planning workgroups
- Develop and institute a formal credentialing program for first responders and stakeholders
- Ensure all rescue personnel have a minimum level of technical rescue training consistent with hazards, risks and potential disaster assignments
- Develop, formalize, and implement a first responder home preparedness plan
- Formalize and implement an interoperable region-wide evacuee tracking system
- Develop and implement a local and regional five-year progressive catastrophic incident/event training schedule to include all stakeholders
- Identify and develop first responder evacuation sheltering
- Implement a database tracking system of regional first responders and stakeholders skill sets
- Conduct yearly inventory of regional capabilities and equipment resources
- Research and report the impact of and need for the implementation of a formal contraflow system and plan

Response

The tsunami alert was apparently mishandled because a unit in the Chilean Navy did not coordinate effectively with ONEMI. Initial communications indicated that the earthquake occurred inland and that there did not appear to be a tsunami threat. ONEMI also receives its earthquake information from the local colleges who monitor the seismic instruments. It took approximately 45 minutes for ONEMI to receive the information about the earthquake, which was 20 minutes after the first tsunami wave struck the coastline. However, even if the tsunami threat had been identified in a timely fashion by the responsible authorities, it is unlikely that the information would have been relayed in time to the affected localities because the warning system relied on the internet and telephone technology, both of which were off-line as a result of the power grid failure.



Due to numerous factors and considerations, the government's immediate response appears to have been hindered. Due to the power failure, the government was unable to immediately assess local needs, and as a result was initially slow in dispersing essential supplies to the most afflicted cities in the south. Situational awareness is critical during an event of this magnitude, but given the issue of power and communication, the government was unable to quickly grasp the magnitude of the destruction or the needs of those on the ground who were trying to stabilize the situation and conduct rescues, while uncertain if aid was on the way. Moreover, as a result of political considerations and sensitivity to the use of armed forces given the memories of the Pinochet regime, the government delayed the deployment of the army to assist in the relief effort and to maintain law and order.

Furthermore, Chile does not currently have a formal Standardized Emergency Management System (SEMS) or a National Incident Management System (NIMS) similar to the United States. They do have, and use to some extent, the Incident Command System (ICS). The primary first responder agency immediately after the earthquake was the National Fire Department of Chile (Bomberos De Chile). This volunteer-only organization is made up of men and women with total membership numbering over 36,000; 15,000 of them responding to the affected areas following the earthquake.



Only 40 percent of their operational and training budget is funded by the government; the remaining budget is filled by public donations and donations from the firefighters themselves, which they refer to as "pay to play." Amazingly, they willingly pay to put themselves in harm's way. In their words, "it's an honor to serve our country." Only 400



members have received command and control training. They have Urban Search and Rescue (USAR) capabilities but do not appear to have sufficiently trained personnel for large-scale events. This lack of funding and planning has directly hampered their training and development to a level of a regional SEMS.

The Police Department (Carabineros) by comparison has 45,000 members and is a paid occupation. Their planning, equipment and training is fully funded and they, by all accounts, are completely supported by the federal government. There was a visible collaborative and supportive working relationship between Fire and Police Department's frontline personnel. With such a disparity in support and funding, one would not have expected such teamwork, but there was, despite the lack of formal response plans. Their collaborative relationship was an invaluable asset to incident commanders.

We had the opportunity to meet with officials from ONEMI, who were very pleased that ICAT was in their country with representation from so many disciplines, and to discuss with them their prioritization for stabilization and recovery and restoration of resources following the earthquake. Those priorities included:

1. Communications/fixed and wireless
2. Transportation routes (primary roadway and highway arteries)
3. Restoration of electricity and water

Once the government had information about the magnitude of the situation, there was a massive response to the hardest hit areas of Constitucion and Concepcion. Unfortunately, local officials also believe that areas that received the most media attention received the most aid. Consequently, in some cases, cities such as Talcahuano, received little to no aid despite their proximity to the epicenter.

Many personnel resources arrived from out of the region and outside the country without adequate transportation, adequate supplies, or clear assignments, and had no means to deploy to the impacted areas. Many in-country first responders (estimated at well over 500) self-dispatched or were dispatched without assignments based on the damage shown on national television or described by radio stations. The earthquake and tsunamis damaged and blocked roadways, created fuel and supply shortages, and created treacherous driving conditions. As such, large mobile equipment was either abandoned or staged while emergency responders responded in all-terrain vehicles, boats, all-wheel drive pick-up or utility trucks. In the areas with the most damage and debris, emergency response and search and rescue activities were conducted on foot.

Planning for technical rescue does not appear to have been developed to the scale and scope necessary to manage an incident of this magnitude. The regions in the most affected areas were immediately overwhelmed by the volume of rescues that required technical rescue personnel and equipment. Though not as skilled in technical rescue and under-equipped, local mutual aid first responders supported the efforts of the Urban Search and Rescue (USAR) personnel, which allowed technical rescue teams to concentrate on the most affected areas. With 900 buildings destroyed and with major structural damage and thousands of homes destroyed, personnel with technical rescue or search and rescue training were in high demand.



Recommendations for the Los Angeles Region

- Develop a region-wide badging system to allow first responders and essential personnel from other agencies and jurisdictions to gain graduated access to impacted areas and emergency operations centers

Recovery

To initiate recovery efforts after the earthquake, local officials prioritized their efforts to re-establish communications, and to deliver basic lifeline utilities such as water and electricity. Although plans or strategies for building reconstruction and/or waste/debris management do not appear to have been in place, ICAT observed that debris removal and roadway repair had begun. Unsafe buildings and structures, however, still needed to be addressed.

Recommendations for the Los Angeles Region

- Develop multi-jurisdictional debris clearance plans to ensure basic necessities can be delivered

Psychological Impact & Public Behavior

Due to the magnitude of the event, numerous Chilean people were physically, but also psychologically impacted by the earthquake. The psychological impact went beyond the public readiness training that helped keep the initial death toll low and public behavior varied as a result. Some people immediately took to the streets and began to provide medical care to the injured and to conduct rescues of trapped individuals, but panic also quickly spread for others. As mentioned previously, another public behavior that was demonstrated following the earthquake was widespread looting.

First responders were also psychologically impacted by the earthquake (The term 'mental health' is not used in Chile due to perceived negative stigma issues. They refer to mental health as 'psychosocial needs'). Some first responders rescued or recovered the bodies of friends, while others struggled with mixed emotions caused by leaving family and loved ones at home under dire circumstances. Although officials recognized the psychosocial needs impact on the first responders, they do not appear to have planned for it. The Fire Department does not have a formal system for addressing emotional/psychosocial needs issues. Instead, they rely on psychosocial needs professionals who serve on the Department to assist firemen in need. Informal interviews with first responders indicated a need for, and desire to have, some form of intervention to process their experiences as first responders.

Chile does not have a disaster psychosocial needs plan. Their public-private system of care faces the typical challenges of funding and access to care, particularly in the outlying areas. Professional staff from the local colleges and universities provided crisis intervention and psychological first aid to earthquake victims. Responders reported that the needs were significant and consistent with the psychological reactions commonly experienced following a life changing event.



Constitucion, however, provided a good example of how to promote emotional resilience and recovery at a community level. A private company provided community residents with work clothes, hard hats, and basic building tools to assist in assembling prefabricated shelters. Each family who lost their home focused their energy on building their temporary shelter. The residents were observed to have benefitted greatly from participating in the rebuilding effort and in restoring their neighborhoods. The project fostered family and neighborhood collaboration and empowered residents to work constructively towards rebuilding their future. Almost unanimously, these residents voiced their satisfaction with their work and voiced feelings of confidence and optimism. This reaction was in sharp contrast to other communities where residents voiced hopelessness and helplessness.

Lessons Learned

The public behavior of looting and arson are potent reminders of the potentially explosive tensions inherent during a catastrophic incident. In the LAOA, we have experienced similar instances where tension, personal loss, and opportunity have contributed to public unrest. Force protection must be a top planning priority to ensure continuity of operations and government.

Another top priority needs to be the inclusion of disaster mental health training and planning to ensure that first responders are taken care of so that they can continue to do their jobs effectively.

Providing communities the opportunity and resources necessary to begin the rebuilding process is also critical to the overall recovery.

Recommendations for the Los Angeles Region

- Develop Critical Incident Stress Management (CISM) mental health training for first responders and stakeholders
- Continue and enhance Community Emergency Response Team (CERT) training
- Provide debriefing or counseling to first responders exposed to or affected by a catastrophic incident

Sheltering & Temporary Housing

Despite the large numbers of homeless and displaced people, congregate shelter operations were limited and the population did not require large scale mega shelters. Most people displaced by the disaster sought shelter with friends, neighbors, relatives, and at times on their own property and in their damaged dwellings. In fact, the large number of people sheltering in place changed the demands and delivery for food, water and sanitation maintenance.





The Chilean Red Cross provided approximately 600 temporary homes for sheltering and approximately 1,600 tents for families. Ten thousand individuals were sheltered in camps in



the Bio Bio Region. At a smaller camp in Bio Bio, one hundred tents were set up; however, individuals felt the distance to travel for access to water was too great. The camp was relocated higher in the hills, but challenges occurred on a geopolitical front.

Many residents also had personal tents and camping supplies and remained self-sufficient for a limited period of time. In fact, when the Chilean Red Cross arrived in some of the affected areas, residents had already erected their personal tents. Unfortunately, many of

the tents that were used were rated for summer use and did not prove fully adequate for adverse weather conditions.

The government is in the process of building temporary housing and supporting the cleaning of houses. These are basic plywood structures that do not have running water or electricity. Initially, these temporary housing structures were built on the hillsides away from the water front and threat of tsunami. However, because the evacuees wanted to be located near their destroyed homes, the evacuees dismantled the structures and rebuilt them near the site of their original homes.

Recommendations for the Los Angeles Region

- Review current efforts to address the provision of support to people sheltering in place and enhance efforts and plans, as necessary.

Access and Functional Needs

Chile has an estimated 13 percent of its population with access and functional needs; however, according to Chile's ambulance system (SAMU), there is a list of persons and locations with access and functional needs but there are not specific operational procedures in place to provide assistance to them during emergencies. The United Nations Committee on the Rights of People with Disabilities has urged the Chilean Government to include this population in their future planning efforts, and it is important for the LAOA to consider this in their planning efforts, as well.

Recommendations for the Los Angeles Region

- Review all current emergency preparedness plans and ensure that the needs of people with disabilities are addressed
- Prepare an implementation process, including steps and timeline, to implement the revised plans



NGOs and Volunteer Management

There does not appear to have been a mechanism in place for volunteer management, which proved problematic for the responders on the ground. Significant numbers of spontaneous volunteers responded to help, thought to have occurred due to their national pride and commitment to the community, but it complicated the situation. Upon their arrival they were not used or were under-utilized. Self-dispatching and arriving to impacted areas created an undue burden on the local community as public safety agencies were already over-burdened and depleted of essential resources and supplies. This issue created command and control problems, accountability problems and stripped many regions and communities of much needed first responders. This burdened a system that would have benefited from a larger resource management strategy.

They also do not appear to have an updated and vetted resource inventory of personal skills and abilities of local responders or local volunteers. When heavy equipment was needed, first responders had no choice but to operate the equipment and machinery in support of search and rescue operations, firefighting activities, and road recovery efforts.

Chilean Red Cross

The Chilean Red Cross (CRC) was founded in 1903 and organized into 10 regional committees comprised of mostly volunteer men and women. Because of the structure and make-up of the Chilean Red Cross, no approving authority is needed to provide assistance. The Chilean Red Cross toured the affected regions within two days of the earthquake to assess health needs and plan accordingly.

The CRC headquarters was equipped with emergency generators and therefore unaffected by the blackout and remained self-sufficient. They activated response mechanisms and set up a special office to centralize and coordinate the response and relief efforts in coordination with ONEMI.

On the second day post incident, the CRC distributed 3000 hygiene kits and 3000 blankets from its headquarters' warehouse. The CRC also provided mobile kitchens, blankets, food and water to the affected areas, and established three temporary hospitals to support medical operations. A total of 12,000 families received assistance from the CRC, including individual debit cards worth \$350 to assist in a family's recovery efforts.

The CRC main activities included:

- Collection of humanitarian aid in coordination with ONEMI
- Damage and aerial assessments (via privately donated helicopters)
- Preparation of food kits; water and water purification
- Sanitation and emergency sheltering
- Collection of funds and the organization of a donation campaign (launched March 1st)
- Reuniting families through family reunification centers



The CRC is recognized and considered a substantial player in disaster response with the newly elected government. A period of educating the new government in regards to CRC roles and responsibilities is an ongoing process. The CRC regional office located in Concepcion was completely destroyed by the tsunami. This forced their relief operation to relocate to a gymnasium inland where they established a clothing distribution effort.

The response from the Red Cross Organization was worldwide. Emergency health units were deployed into the field and managed by the Finnish Red Cross. Medical supplies were brought in from external sources; however, local medical professionals were utilized to execute service delivery. CRC worked through the American Red Cross regional warehouse in Panama to procure resources for the emergency shelters or camps that were erected.

Additional Resources

The Church of Jesus Christ of Latter Day Saints, along with other agencies, self-dispatched and provided feeding resources. The governments of both China and Japan deployed feeding units. In addition to organizations providing these resources, families and friends provided feeding capabilities at a more grassroots level. Currently, local municipalities are providing food; and the Army monitors food quality and health concerns. Although there were sufficient feeding capabilities, there were significant shortages of food. Water distribution proved challenging as inferior means of transportation were used. Tankers and other storage equipment previously used for other liquid substances were utilized to store and transport water.

Recommendations for the Los Angeles Region

- Establish donation and volunteer management protocol and policy



Conclusion

There are many lessons to be learned from the February 27, 2010 8.8M earthquake in Chile. These lessons range from building codes, social response to catastrophe, human endurance in the aftermath of a life altering event, to basic planning and response.

Through the FEMA Regional Catastrophic Planning Grant Program, an opportunity was realized to analyze information on the planning and response efforts of the Chile earthquake, and the events that followed. The ICAT mission to Chile saw how operationally the Chilean Government, Law, and Fire responded to the February earthquake. It was explained in great detail the trials and tribulations the locals experienced, in particular the local Fire and Police Departments in their response to the earthquake.

Overall Strengths Identified:

- Utilized the Incident Command System (ICS) to help organize their operation efforts, allowing for efficient and effective incident management
- Long-established set of strict building codes resulting in few catastrophic failures of tall buildings
- Training drills, public awareness and response as part of public education at local levels
- Strong volunteerism, specifically the National Fire Department of Chile (Bomberos)
- Strong collaborative and supportive working relationship between Fire and Police Departments and Chile's ambulance system (SAMU)
- Relationships built with Fire and Police Departments with the communities
- Established aid organizations, specifically Chilean Red Cross

Overall Needs Identified:

- Identified the need for national coordination and to develop a Unified Command approach to deal with large scale disasters
- Identified the need for a public information process and to develop media relations
- Identified the need for multi-agency coordination and training, and to foster relationships with private companies and their ability to assist in emergencies
- Identified the need for a centralized "911" emergency communication center
- Identified the importance of having auxiliary water supplies and sources
- Identified the need to expand ONEMI and its role in emergency management
- Identified the need for training in logistics and technical rescue

Overall Challenges Identified:

- Evacuation plans are minimal and are not coordinated
- Evacuation routes are not pre-identified and marked
- Evacuation plans are not coordinated with other nearby cities
- Lack of planning for access and functional needs population
- No planning for care and sheltering of pets and animals



- Fostering the relationships between government and community
- Alternative ways to communicate other than landlines and cell phones
- Coordinated media relations not part of pre-planning
- No plan for responders' families if they are in the impacted area
- No tsunami warning systems in southern regions of the country
- No pre-established evacuation centers or infrastructure to support mass evacuations

The study of the Chile earthquake provided valuable information for direct comparison to the LAOA, California, and the nation as a whole. The lessons learned are timely, critical, and should be utilized in our regional methodologies and strategies. ICAT focused its analysis, lessons learned, and recommendations directly on the key areas that could be applied to the regional catastrophic earthquake planning and preparedness process. These areas include: Structural Impact, Infrastructure Impact, Planning, Preparedness & Response, Communications, and Psychological Impact & Public Behavior.

The lessons learned from the Chile earthquake demonstrate that while we are headed in the right direction, a much more targeted approach needs to be mandated and instituted. It was evident in Chile that, while some of the safeguards and processes the government had instituted saved thousands of lives and may have lessened structural damage significantly, that more thorough preparation and post-incident training of first responders, stakeholders, and of the public, could have lessened the total impact of this catastrophic incident. Preparedness, education and solid planning need to remain key factors as we move forward with planning for the Los Angeles Region.



Appendix A: Official Trip Agenda

Sunday - May 30, 2010

- 0735 Arrive at International Airport in Santiago
- 0830 Arrive at Crown Plaza Hotel, Santiago
- 1000 Travel to the City of Valparaiso
- 1200 Arrive at the Sotomayor Square (Valparaiso), work meeting at the Fire Department Headquarters and visit to 2 Branches
- 1400 Lunch meeting at Calehuche Restaurant (Chilean Navy's Restaurant)
- 1530 Travel to the City of Vina del Mar, visit to Fire Department 7 & 8 Branches
- 2000 Return trip to Santiago

Monday - May 31, 2010

- 0915 Welcome meeting, speech by the National Fire Department President
- 0945 Presentations/ Exhibitions of National Agencies
- 1000 Speech by Chilean Fire Department's President
- 1015 Exhibition by Chile's Fire Department
- 1100 Exhibition by Chilean Red Cross
- 1130 Presentation by SAMU (Municipal First Aid)
- 1200 Presentation by Chilean Police Department
- 1230 Presentation by Civil Protection Agency
- 1330 Lunch meeting with Fire Executives
- 1600 Travel to the City of Talca
- 1900 Arrive at the Counsel Regional, presentation and work meeting
- 2000 Overnight stay at the Diego de Almagro Hotel, Talca



ICAT met with Mr. Miguel Reyes, President, Bomberos De Chile Nacional, at the Bomberos De Chile National Headquarters, Santiago, Chile. Mr. Reyes provided a brief welcome and acknowledged members of ICAT as being the first recognized delegation from the United States. After a brief opening ceremony, ICAT heard presentations by multiple agencies about the event and aftermath.

**Tuesday - June 1, 2010**

- 0830 Travel to the City of Constitucion
- 1100 Constitucion's Fire Department presentation, work meeting, ground zero visit
- 1400 Lunch
- 1600 Visit the cities of Parral and Cauquenes
- 2000 Arrive in Concepcion

The site visit to Constitucion included meetings with the Mayor, City Council members, the Chief of Police, and the Superintendent of the local Fire Department. Constitucion has a population of approximately 60,000 people.

ICAT traveled from Constitucion to Concepcion and stopped in Chanco and Cauquenes along the way to view damage caused by the earthquake.

Wednesday - June 2, 2010

- 0900 Regional Counsel Bio-Bio, presentations, work meeting, visit ground zero
- 1400 Lunch
- 1600 Visit to the country side and the cities of Tome, Dichato, and Talcahuano
- 2000 Return to Santiago

Thursday - June 3, 2010

- 0830 Meeting with Police (Carabineros) Division Commander - Santiago
- 0900 Visit to the Campus ANB, work meeting, and visit to the Fire Training Campus
- 1115 Visit to the Fire Department 1st Branch, Santiago
- 1330 Lunch at the Fire Department 1st Branch, Santiago
- 1530 Meeting at ONEMI
- 1900 Return to Crown Plaza Hotel

Friday - June 4, 2010

- 1000 Visit to cultural and shopping centers
- 1400 Lunch at the Fire Department's National Bomberos Headquarters, closing ceremony and presentation speech from the Alliance
- 1800 International Airport in Santiago
- 2000 Departure - Santiago International Airport to Los Angeles



Chilean Contacts

<u>First Name</u>	<u>Last Name</u>	<u>Title</u>	<u>Organization</u>
Pedro	Pavez	Interpreter	Bomberos de Chile
Juan	Pablo Garcia	Asesor Desarrollo Estrategico	Gobierno De Chile
Robinson	Talavera C.	Director Nacional de Salud	Cruz Roja Chilena
Nelson	Hernandez Marulanda	National Director of Disaster Risk Management	Cruz Roja Chilena
Alvaro	Garita Solis		Cruz Roja Chilena
Leonardo	Saleh Sabat	Jefe De Gabinete	Bomberos de Chile
Jose	Echiburu Nunez	Secretario Nacional	Bomberos de Chile
Maximiliano	Eugenio Hernandez	Superintendent	Bomberos de Chile
Fernando	Recio Palma	Asesor Juridico	Bomberos de Chile
Oscar	Salgado Garrido	fiscal Adjunto Jefe	Fiscalia
Helia	Vargas	Centro Alerta Temprana	ONEMI
Miguel	Ortiz	Centro Alerta Temprana	ONEMI
Andrea	Campodonico	Asesora de Comunicaciones	ONEMI
Leonardo	Ristori	Servici De Atencion Medica De Urgencia	SAMU
Alfredo	Lagos	Colonel	Carabineros
Yazmin	Castillo	Health in Emergencies	International Federation of the Red Cross
Miguel	Reyes	President	Bomberos de Chile



Map of Chile





Appendix B: ICAT Biographies

ICAT was comprised of representatives from the Los Angeles Operational Area and regional partners from Riverside and Orange County.

Tony Beliz, Ph. D.

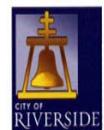
Deputy Director, Los Angeles County Department of Mental Health



Dr. Beliz is currently Deputy Director, Emergency Outreach Bureau (EOB) Los Angeles County Department of Mental Health. He coordinates the county-wide mental health response following a disaster or mass casualty incident. EOB Emergency Response Teams (ERT) provide immediate field response to first responders and their families, survivors, special populations, and the community at large. Mental health services are coordinated with local private service providers and professional organizations to ensure a coordinated and effective response. ERT staff receives specialized training in critical incident stress management, psychological first aid, and other interventions specific to disasters or mass casualty incidents. Dr. Beliz/ERT assisted New Orleans Fire and other local Fire Departments following Hurricane Katrina and also responded to the Chatsworth Metrolink and Glendale train incidents. ERT has responded to local fires, earthquakes, airline tragedies, and local community impacted by 9/11. EOB recently developed the first Family Assistance Center (FAC) in the country. FAC is activated through the County's Emergency Operations Center to provide immediate disaster mental health, briefings, notifications, and other social services to survivors of a disaster or mass casualty incident. EOB is finalizing a Disaster Mental Health Con Ops manual in an effort to standardize and coordinate county and statewide disaster mental health response efforts.

Anthony Coletta

Program Administrator, City of Riverside Office of Emergency Management



Appointed Emergency Services Manager for the City of Riverside, Mr. Coletta is responsible for coordinating all city-wide emergency management and homeland security activities. Prior to his appointment, Mr. Coletta served as the Operations Manager for the Riverside County Fire Department, Office of Emergency Services, and was responsible for coordinating field operations as well as managing the County's Emergency Operations Center.

Mr. Coletta instructs Standardized Emergency Management System (SEMS), National Incident Management System (NIMS), Incident Command System (ICS), EOC Operations, Hazardous Materials Response and Comprehensive Emergency Management. He sits on several state and federal emergency management Workgroups, committees and training cadres. Mr. Coletta has degrees in Emergency Services Administration and Criminal Justice Administration. He has a background in law enforcement, the fire service and has enjoyed more than twenty-five years in public safety. He has been a volunteer firefighter in New York and a full time firefighter/paramedic for the City of Indio, California.



Corey Eide

Assistant Director, American Red Cross



Mr. Eide is in his fifth year with the American Red Cross and has been with the Greater Los Angeles Chapter since 2007. Prior to coming to Los Angeles, he served as the Response Manager for the Riverside County Chapter of the American Red Cross during which he led the chapter in their response to the deadly Esperanza fire as well as county-wide care & shelter planning. Since relocating to Los Angeles, Mr. Eide has focused on building readiness levels of mass care internal to the organization and critical planning with local government. Additionally, Mr. Eide oversees partnerships and the Disaster Response Personnel Section. Mr. Eide has participated on both state and national planning efforts and most recently has supported the development of mega-shelter best practices with the International Association of Assembly Managers, INC. and the American National Red Cross.

Mike Ferdig

Battalion Chief, Orange County Fire Authority/Office of Emergency Management



Battalion Chief Ferdig is the Chief of Emergency Planning and Coordination for the Orange County Fire Authority (OCFA). Chief Ferdig has 31 years in the fire service and has held the ranks of Firefighter, Fire apparatus Engineer, and Captain, before promoting to Battalion Chief in 2005. In his current position, Chief Ferdig is responsible for coordinating and maintaining many of the Fire Authority's and the County of Orange Fire Service emergency plans. He also serves the OCFA as the grant manager, coordinator of the National Bio-Watch Program, coordinator of the Terrorism Liaison Officer Program, representative to the Orange County Emergency Council, Orange County Tsunami Plan Development Committee member and Orange County representative/liaison to the American Red Cross.

Eric Fox

Sergeant, Los Angeles County Sheriff's Department



Sergeant Fox has been with the Los Angeles County Sheriff's Department for 25 years. He has worked a variety of patrol assignments both as a deputy and as a sergeant. His most current assignment is at the Emergency Operations Bureau, assigned to the Tactical Planning and Logistics Section. He is in charge of all emergency response equipment assigned to the Homeland Security Division, including all mobile command posts and Los Angeles Regional Common Operational Picture Program (LARCOPP) equipment. He routinely responds to major incidents throughout the operational area both for the County of Los Angeles and as a mutual aid resource. Sergeant Fox has been in charge of large events such as the Presidential and Gubernatorial elections and the annual Tournament of Roses Parade. He also manages the UASI Grant program for the Sheriff's Department and is the LARCOPP Regional Coordinator for the Operational Area. Sergeant Fox was formally one of the original members of the Alliance Team and served as a section lead at that assignment.

**Jim Gordon**

Sergeant II, Los Angeles Police Department



Sergeant Gordon is a 28-year veteran of the Los Angeles Police Department (LAPD). In the course of his career, Sergeant Gordon has worked with all levels of government as well as the private sector to develop strategies and procedures to mitigate the effects of both natural and terrorist-driven disasters. He assisted in the creation and development of Operation Archangel, a national model used to identify and assess critical locations (including the 18 sectors of infrastructure), key resources, and to plan multi-agency/disciplinary protection, deterrence, mitigation, response and risk/consequence management initiatives related to catastrophic/critical incidents and disasters. He also is Chief Instructor for the Department of Homeland Security (DHS) Critical Infrastructure / Key Resource Asset Protection-Technical Assistance Program (CAP-TAP). In addition, he was part of the design team for the DHS ACAMS database and has traveled to 37 states and five countries, sharing and gathering best practices and lessons learned.

Chris Ipsen

EPC II, Los Angeles Office of Emergency Management



Mr. Ipsen is an Emergency Preparedness Coordinator II, assigned to the City of Los Angeles Emergency Management Department (EMD) since 1998. He currently serves as the Communications Division Chief. His assignment includes managing crisis communication for EMD and the City's Emergency Operations Center (EOC), as well as maintaining EMD's websites and social networking strategies for use in emergency planning and response. He routinely appears on English- and Spanish-speaking television networks providing information to residents regarding current events, disasters, homeland security issues and disaster readiness. Mr. Ipsen has worked on numerous special projects, including the City's Y2K Public Information Campaign, the 2000 Democratic National Convention as a translation services coordinator, Mr. Ipsen Information Workshops in Central and Latin America, partnerships with Mexico City with their Federal Police Agency, and Media Survival training.

Robert Takeshita

Fire Captain, Los Angeles Fire Department



Captain Takeshita has 22 years of service with the Los Angeles Fire Department and promoted to the rank of Fire Captain in 2000. In 2009, he was assigned full time to the Homeland Security Division, Alliance Training Section, in which he is assigned as the Special Operations/Training Unit Lead. He has traveled across the nation and is responsible for writing Benefit Statements and Travel Justifications to the City Mayoral Staff for review and approval. Additionally, Captain Takeshita works as a liaison with the Emergency Management Department and attends UASI and RCPGP meetings and workshops on a regular basis. He has held two different ranks as a Fire Officer and has received training in Critical Incident Stress Debriefing and assigned as a Department Advocate in the Internal Affairs Division. Additionally he was a Drill Instructor at the LAFD Drill Tower Academy and has served on several boards and committees within his organization. He received a Bachelor of Arts Degree from UCLA in Physical Geography/Ecosystems and is a State of California Certified Fire Officer.



Appendix C: Recommendations for the Los Angeles Region

COMMUNICATIONS RECOMMENDATIONS

- Ensure redundancy of critical communications facilities
- Build communication failure protocols into emergency response plans
- Develop a yearly comprehensive exercise, including integrated fallback procedures for catastrophic communications system failure (local, regional and state)
- Expand the number of rapid response mobile communication vehicle platforms, such as the Department of Homeland Security/Los Angeles Police Department Archangel Vehicles
- Have sufficient number of satellite phones deployed daily with first responder agencies
- Consider expanding the HAM radio program
- Ensure public alert notifications are able to be delivered during a catastrophic communication systems failure
- Obtain portable repeater systems
- Pre-position mobile assets throughout the region for rapid replacement communication systems
- Cross-train regional partners and stakeholders on strategic/critical communications systems
- Enhance local government's use of radio and social media outlets.

STRUCTURAL IMPACT RECOMMENDATIONS

- Conduct a structural review of older, first responder facilities and their supporting infrastructure
- Develop and exercise plan for first responders and stakeholders that test safety plans and preparedness
- Conduct regular and frequent "drop, cover & hold" shakeout drills
- Coordinate an exercise for secondary or fall back facilities (COOP/COG)
- Conduct yearly tall-building evacuation exercises for management and on-site staff
- Develop public education programs that drive interest and commitment

INFRASTRUCTURE RECOMMENDATIONS

- Develop a model to assess the seismic performance of interdependent/dependent critical infrastructure systems and re-locate out of potential tsunami flood zones
- Develop a Rapid Response Organized Assessment and Repair (RROAR) teams to respond quickly to repair damaged critical infrastructure.
- Develop a regional catastrophic earthquake work group with strategic stakeholders
- Assess airport runways at major airports to determine the impact a large earthquake would have, and develop RROAR capabilities



- Pre-stage heavy equipment (e.g., bull dozers, dump trucks, cranes) in safe zones near predicted roadway/highway failure points
- Assess possible impact to first responder, emergency management and key government members' ability to respond and/or report for duty in a catastrophic event
- Conduct real-time rapid response runway repair drills at major airports
- Develop comprehensive port design code, including requirements for port evacuation following a major earthquake
- Integrate all port and airport emergency plans with local and regional emergency management and first responder agencies to include exercises and drills

PUBLIC SAFETY AND SECURITY RECOMMENDATIONS

- Develop strategically placed Points of Distribution (POD) for first responder equipment and supplies
- Increase number of local and regional Urban Search and Rescue (USAR) trained personnel
- Establish security details consisting of law enforcement personnel to safeguard critical facilities, including fire stations and ports, to prevent looting of these facilities
- Establish PODs for water distribution to the public
- Ensure correct and consistent public messaging and public messaging for water PODs locations

COMMUNITY PREPAREDNESS RECOMMENDATIONS

- Develop a public education campaign to educate the public on expectations and effects from a catastrophic earthquake
- Increase public earthquake preparedness from three days to seven days
- Install and utilize a tsunami warning system in all coastal areas
- Conduct community-based training drills

EMERGENCY PLANNING RECOMMENDATIONS

- Establish a federally funded pilot program utilizing local entities to develop regional catastrophic planning initiatives, programs, and best practices
- Conduct a scenario-based catastrophic disaster needs assessment and matrix
- Establish a plan review hierarchy for non-agency-specific plans i.e., emergency management departments having primary review, coordination and integration responsibility to include final approval of all catastrophic planning and plans
- Develop fully comprehensive catastrophic incident/event plans i.e.,:
 - COOP/COG
 - Evacuation
 - Transportation and Reception
 - Mass Care Sheltering (short & long term)
 - Tsunami Evacuation and Recovery
 - Coordinated Rapid Catastrophic Incident/Event Response
 - Large Scale Responder Security & Escort



- Responder Preparedness & Support
 - Volunteer & Donation Management
 - Points of Distribution (bulk commodities & medical)
 - Fatality Management
 - Mental Health
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- Ensure full integration of plans with the regional partners and stakeholders to include colleges and schools, correctional facilities, mental health professionals, medical facilities, and private sector stakeholders/partners
 - Develop, establish, and conduct county and regional integrated stakeholder catastrophic planning workgroups
 - Develop and institute a formal credentialing program for first responders and stakeholders
 - Ensure all rescue personnel have a minimum level of technical rescue training consistent with hazards, risks and potential disaster assignments
 - Develop, formalize, and implement a first responder home preparedness plan
 - Formalize and implement an interoperable region-wide evacuee tracking system
 - Develop and implement a local and regional five-year progressive catastrophic incident/event training schedule to include all stakeholders
 - Identify and develop first responder evacuation sheltering
 - Implement a database tracking system of regional first responders and stakeholders skill sets
 - Conduct yearly inventory of regional capabilities and equipment resources
 - Research and report the impact of and need for the implementation of a formal contraflow system and plan

RESPONSE RECOMMENDATIONS

- Develop a region-wide badging system to allow first responders and essential personnel from other agencies and jurisdictions to gain graduated access to impacted areas and emergency operations centers

RECOVERY RECOMMENDATIONS

- Develop multijurisdictional debris clearance plans to ensure basic necessities can be delivered

PSYCHOLOGICAL IMPACT & PUBLIC BEHAVIOR RECOMMENDATIONS

- Develop Critical Incident Stress Management (CISM) mental health training for first responders and stakeholders
- Continue and enhance Community Emergency Response Team (CERT) training
- Provide debriefing or counseling to first responders exposed to or affected by a catastrophic incident



ACCESS AND FUNCTIONAL NEEDS

- Review all current emergency preparedness plans and ensure that the needs of people with disabilities are addressed
- Prepare an implementation process, including steps and timeline, to implement revised plans

NGOs and VOLUNTEER MANAGEMENT

- Establish donation and volunteer management protocol and policy



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