

# **Bay Area Regional Disaster Resilience Initiative**

## **Infrastructure Interdependencies Workshop II - Essential Goods and Service Providers**

### **Summary Report of Proceedings**

Held May 2, 2012  
At Applied Materials, Santa Clara, CA

## Executive Summary

Bay Area government, private sector, and non-profit organizations participated in the second of two workshops focusing on Bay Area infrastructure. Infrastructure Interdependencies Workshop II, held May 2, 2012 at Applied Materials in Santa Clara, examined disaster recovery challenges associated with dependencies and interdependencies of financial institutions, food and agriculture systems, hospitals and healthcare providers, the building materials industry, and community and academic institutions. Interdependencies Workshop II built on the first Interdependencies Workshop that was held on January 31, 2012, which focused on utilities, transportation, and communications systems. Workshop II was the third in a series of events held by a broad coalition of Bay Area organizations to undertake a Bay Area Regional Disaster Resilience Initiative focusing on long-term disaster recovery. The workshop was structured with sessions focusing on the various infrastructure sectors consisting of short overview presentations from infrastructure and essential goods and service provider representatives on their services and products, service area, key customers, and priority dependencies and interdependencies concerns, and how they are addressing them.

### Key Findings

1. **Cross-Sector and multi-jurisdiction (local/state/federal including military) collaboration and coordination** are crucial to identifying, understanding, and addressing interdependencies of essential goods and service providers.
2. **Disaster management roles, responsibilities, and authorities**, including those of essential goods and service providers, should be examined and better delineated and understood, along with structures that incorporate key stakeholders in the decision-making process.
3. **Useable and accurate information and situational awareness** are seen as a critical need by providers of essential goods and services to deal with interdependent operational and business continuity requirements.
4. **Outsourcing disaster preparedness and management to social service organizations has created a significant vulnerability** in that they may be unable to sustain these efforts in an era of budget constraints.
5. **Public education and training** are necessary to inform citizens of the conditions they can expect post-disaster in respect to availability of essential goods and services. Cross-sector exercises are an important tool to identify interdependencies gaps, potential mitigation measures, and foster coordination and collaboration.
6. **Issues and gaps that were suggested for incorporation into the Bay Area Resilience Initiative** include: regional mapping of critical infrastructures and essential goods and services providers to enable assessment of consequences, clear guidance for managing disaster volunteers, engagement of communities at the neighborhood level in disaster resilience, outreach to and education of elected officials on disaster recovery issues and needs, and further examination of lessons learned associated with infrastructure interdependencies from past events.

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# Infrastructure Interdependencies Workshop II

## Essential Goods and Service Providers

Bay Area government, private sector, and non-profit organizations reconvened on May 2, 2012 at Applied Materials in Santa Clara to participate in the second of two workshops focusing on Bay Area infrastructure interdependencies of essential goods and service providers that are fundamental to the Bay Area's economy and the health and safety of its citizens. The Infrastructure Interdependencies Workshop II examined disaster recovery challenges associated with dependencies and interdependencies of financial institutions, food and agriculture systems, hospitals and healthcare providers, the building materials industry, and community and academic institutions. Workshop II built on the first Interdependencies Workshop that was held on January 31, 2012, which focused on the interdependencies among power, water and wastewater, communications, and transportation systems. This second Interdependencies Workshop was the third in a series of events held by a broad coalition of Bay Area organizations to undertake a Bay Area Regional Disaster Resilience Initiative.<sup>1</sup> The action plan will build on existing capabilities and identify and prioritize needed activities to better prepare the Bay Area for a rapid post-disaster recovery.

### 1. Workshop Goals and Objectives

Objectives of the workshop were to:

1. Examine how earthquake scenarios could impact the region's interdependent essential goods and service providers and potentially impede recovery and restoration.
2. Explore the regional interdependencies that businesses and essential goods and service providers must address in:
  - Assessing damages and restoring services;
  - Developing recovery plans and processes to minimize business disruption;
  - Communicating expected service resumption and restoration timelines to customers and the public;
  - Managing policies, regulations and other constraints that could impede timely service resumption.
3. Highlight the challenges in maintaining the health and safety, economic, and environmental well-being of the region during the recovery process.

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<sup>1</sup> Co-organizers of the workshop were the Association of Bay Area Governments, Bay Area Center for Regional Disaster Resilience, California Resiliency Alliance, Carnegie Mellon University Disaster Management Initiative, National Disaster Resiliency Center, and San Jose Water Company. Workshop sponsors were Applied Materials, Inc., Vanir Technology, Inc., and The Greenspan Co./Adjusters International.

4. Underscore the value of public, private sector, and non-profit cooperation in meeting the challenge of interdependent systems and provide opportunities to develop mutually beneficial relationships during the workshop.
5. Create new contacts and connections for cross-disciplinary collaboration and information-sharing to create the necessary awareness and common operating picture to facilitate recovery.
6. Create awareness and understanding of interdependencies goods and service systems and needed activities to improve resilience, as well as initial ideas for how to further explore these needs, for incorporation into:
  - Organizational and business continuity plans and community recovery plans;
  - The Bay Area Regional Disaster Resilience Action Plan.

## 2. Scope and Format

Interdependencies Workshop II continued the focus of the previous Workshop I on the dependencies and interdependencies within and beyond the Bay Area among critical infrastructures and essential goods and service providers that underpin the economy, and public health and safety of Bay Area citizens. While the primary focus of the workshop was on disaster recovery, the workshop also addressed how preparedness, response, and mitigation issues impact recovery.

The day-long workshop, like the previous Interdependencies Workshop, was structured with sessions focusing on the various infrastructure sectors with short overview presentations from infrastructure and essential service provider representatives on their services and products, service area, key customers, and priority dependencies and interdependencies concerns and how they are or plan on addressing them. Each session included a period for interactive discussion that focused on questions and comments from the participants. *(For agenda and session issues questions, see Appendix B)*

## 3. Highlights of Proceedings and Participant Observations

*Note: As in the case of the Nov. 1, 2011 Initiative Kick-Off Workshop, information gathered from the presentations and participant observations and discussions will be augmented with lessons learned from other regional workshops, exercises, and activities, and data collected on Bay Area plans, tools, technologies and other capabilities and incorporated into the Action Plan and supporting Gap Analysis.*

The following narrative represents the highlights and key points from each of the activities on the day's agenda.

### **3.1. Opening Remarks**

#### **State/Local Perspectives**

*Christina Curry, Assistant Secretary of Preparedness, Cal EMA*, set the tone for the workshop by underscoring the importance of addressing infrastructure interdependencies for disaster preparedness and recovery and that they are a reason behind SEMS, the Standardized Emergency Management System, which is the basis of the state's emergency response structure for managing major disasters and events. She pointed out that the Bay Area is part of a global system—interdependencies do not respect organizational or jurisdictional boundaries. This means that we cannot operate as individual sectors. She noted the importance of public-private partnerships in addressing interdependencies challenges and of collaboration among emergency management at all levels of government and with public health and law enforcement. Five years ago, California began to work with private sector partners to take a systems approach to disaster preparedness and management. An example is the Southern California fires, where lot of private sector support and resources were utilized, and the H1N1 response, in which the private sector assisted with the deployment of pharmaceuticals.

Curry also said that today, there are 14 private sector partners participating in the State Operations Center and good assistance on resources. Looking ahead, she said that Cal EMA's Critical Infrastructure Protection Division has been assessing infrastructure sector vulnerabilities, particularly the food and agriculture sectors. They are also focusing on potential energy assurance challenges this summer associated with the shutdown of the San Onofre nuclear power plant for refurbishment. She lastly noted the state's Golden Guardian exercise for 2013 will be focusing on earthquake recovery in the Bay Area, and that Cal EMA welcomed stakeholder input to the scenario and issues that should be explored through events such as today's Interdependencies Workshop.

*Janell Myhre, Director, Santa Clara County Office of Emergency Services*, provided the local government perspective on infrastructure interdependencies and the importance of cross-sector and cross-jurisdiction collaboration. She noted that California has been a lead in many emergency preparedness areas, creating the Emergency Management Agency Coastal Region to facilitate coordination of 10 counties and adopted an Emergency Management Coordination Plan in 2005. A useful case study highlighting the need for a multi-jurisdiction/private sector/non-profit organization to address a significant incident is the 2007 Cosco Busan container ship oil spill in the Bay, with widespread interdependencies impacts on commercial fishing, fuel supply, ferries, cargo operations at the port and shipping, as well as the Bay ecosystems and wildlife. The Coast Guard was activated and a Unified Command set up. Public concerns and perceptions were huge issues. The incident resulted in the creation of a local coordination effort that was a new development for the By Area. A related issue was the influx of more than 4000 volunteers who arrived on the scene, spurred by social media accounts of the environmental issues. The oil spill demonstrated the need for coordination among state and local officials as well as between the unified command and affected local communities starting early in the response and recovery process, and also for incorporation of local emergency response structures into contingency planning. Consideration should be given to adding a local on-scene coordinator position in the Unified Command structure.

Q&A – Key Points Raised

- There is significant need for orchestrating how to involve volunteers in post-disaster response and recovery activities.
- The State has established a California Volunteers office to handle emergencies and other volunteerism activities.
- The State is also working with regional water systems through the California Water/Wastewater Agency Response Network (CalWARN), which supports and promotes statewide emergency preparedness, disaster response, and mutual assistance matters for public and private water and wastewater utilities.
- In Santa Clara County, Collaborative Agencies Disaster Relief Effort (CADRE) works with the County Office of Emergency Services to enable non-profit organizations to provide support and resources in emergencies.

### **3.2. Interdependencies II Workshop Overview**

*Danielle Hutchings, Earthquake and Hazards Program Coordinator, Association of Bay Area Governments*, defined human resilience as the capacity to effectively influence and adapt to change, and that it could be applied to many things beyond just disaster resilience. She commented that a community is unlikely to be disaster resilient if it is not also socially, environmentally, economically resilient. Resilience requires resilient individuals, organizations, communities, and regions. She referred to FEMA's Disaster Recovery Continuum, which lays out a process that includes an ongoing preparedness phase, a short-term post-event response phase, an intermediate recovery phase of weeks to months, and a long-term recovery phase of months to years post-disaster.

Hutchings noted that the goal of the Bay Area Regional Disaster Resilience Initiative for the past eight months has been to work with stakeholders to understand what is being done already and what collaborative planning and activities need to be undertaken for a successful Bay Area recovery after a disaster. The emphasis of the Initiative is on reconstituting lifelines, businesses, government services, community institutions, housing, and essential services that underpin the region's economy. Hutchings briefly described the process so far: a Housing and Business Recovery Workshop held November 1, 2011, an Infrastructure Interdependencies Workshop I January 31, 2012, a Resilience Survey, a Gap Analysis of current resilience capacities (underway), and a draft list of priority recovery issues that require regional coordination and collaboration. Hutchings highlighted some key findings of these activities thus far: that current understanding of infrastructure interdependencies is very limited; cross-sector collaboration on disaster preparedness and recovery is limited but growing; there currently is no regional disaster recovery framework or process for operational and financial decision-making post-disaster; regional situational awareness during recovery is essential for decision-making; and that stakeholders find it challenging to look beyond the immediate post-disaster response period to long-term recovery needs. She lastly provided an overview of the agenda of the day's workshop, noting that essential goods and services are not normally a focus of this type of event.

### **3.3.Session 1. Banking and Financial Institutions**

**Moderator: Peter Ohtaki, Executive Director, California Resilience Alliance**, opened the panel with the observation that infrastructure interdependencies are commonly associated with utilities and transportation, and it was fortuitous that the workshop was looking at other essential services. He noted that businesses are dependent on financial services for credit and money, including loans and financing for rebuilding.

**Barry Cardoza, BARCfirst**, described the internal dependencies and interdependencies of banks, observing that people are the most critical factor. Other dependencies/interdependencies include technologies, back-up systems including data centers to provide operational redundancy, facilities, and communications and information technology capabilities. External dependencies and interdependencies include power and transportation, critical vendors, other financial institutions, the federal reserve, armored car carriers, facilities management companies, large banks that may specialize in a particular service, and public sector authorities that can close schools and businesses.

He observed that stakeholders need to address whether their business after a major disaster or event would be able to perform financial transactions. If not, what measures could be taken to deal with the challenge? There is oversight of financial institutions to ensure preparedness, for example, the Federal Financial Institutions Examination Council (FFIEC), Comptroller of the Currency (OCC), and the Securities Exchange Commission. There are also recognized national and/or international standards like NFPA 1600, BS 25999, and the emerging International Standards Organization's ISO 22301 standard on Business Continuity. Banks may have an additional obligation to certify against one of those standards under the Private Sector Preparedness Accreditation and Certification Program (PS-Prep) due to competitive pressures. In addition, financial institutions are collaborating to increase security and resilience and are working with cross-sector and federal, state, and local agencies in various partnership arrangements, such as the ChicagoFIRST model, which has spread across the country. BARCfirst, the Northern California Business Continuity financial coalition, is based on this model, as is SoCalFirst, the Southern California Coalition. He concluded by pointing out that the Bay Area has in the last few years experienced various regional crises—for example, wild fires, H1N1, the San Bruno gas pipeline explosion, and civil protests, and that Bay Area financial institutions appear to have so far dealt with these events well.

**Mike Luckin, Senior Vice President, Enterprise Risk Management, Technology Credit Union (TechCU)**, said that Technology Credit Union is a regional financial institution focusing chiefly on Silicon Valley and the broader South Bay. It has \$1.5 billion in assets with 70,000 members and 10 retail locations. Many of its members are high-tech firms that are highly dependent on technology to handle routine banking needs, including ATMs and use of cell phones for deposits and other transactions. Over 90 percent of their operations are handled electronically, so there is concern that these technologies could fail. Key dependencies include commercial power and emergency generators, availability of staff, technology and communications, diverse critical vendors, recovery capabilities, other financial institutions, and the Federal Reserve Bank (for liquidity availability). TechCU, like all credit unions are heavily regulated.

Luckin observed that there are many regulations that cover business operations and also disaster preparedness. Regulatory bodies include the Consumer Finance Protection Bureau, Federal Financial Institution Examination Council, National Credit Union Administration (NCUA), and the California Department of Financial Institutions. A priority disaster resilience need is educating staff on preparedness. TechCU used the Great California Shakeout as an exercise tool for this purpose. Other key needs are assuring availability of critical staff, meeting expectations of customers in the event of a disaster, and most importantly, having access to cash. Lessons learned from Hurricane Katrina included the need for cash to cover customer transactions, lack of coins to make change and impediments to transporting coins, and assuring generators would be operational for a prolonged emergency. He concluded with the observation that smaller financial institutions can handle localized emergencies and small disasters, but will be challenged by significant disasters.

### ***Interactive Discussion – Key Points Raised***

- Other types of financial service organizations—mutual funds, credit companies, brokers, etc., will also be involved in regional disaster recovery. All will need assistance in getting their workforce back to be operational. Certification of personnel is a huge issue that BARCfirst had been addressing.
- Only a few larger banks have mobile ATMs. Credit Unions will need to partner with each other to share ATMs and branches. ATM sites will be posted on bank websites. Smaller banks and credit unions don't customarily have a lot of extra cash on hand and in a major emergency it may take a week to get the necessary cash infusion. Banks are focusing on building partnerships with local law enforcement.
- Re-fueling emergency power generators will be a major concern. To conserve emergency power, banks will shut down certain operations and locations.
- A major earthquake could sever underground cables that support communications and IT operations.
- Public education will be necessary to handle expectations. Non-profits and businesses may find that even with memorandums of understanding with vendors, contractual arrangements may not be honored for resources.
- There will be a need for investment funds post-disaster at reasonable rates. Banks will handle customer needs based on an individual basis.
- An idea is to identify “neighborhood hubs” post-disaster for the location of essential services, including financial instructions, for individuals.

### **3.4.Session 2 - Essential Goods and Services**

***Moderator: Danielle Hutchings, Earthquake Hazards Program Coordinator, ABAG***

***Timothy James, Government Relations, California Grocers Association***, described the California Grocers Association as having 500 retail members operating more than 6,000 food stores in California and Nevada with approximately 200 grocery supplier companies. The Association is a charter member of the Cal EMA Business and Utilities Operations Center (BUOC). He pointed out the essentials that grocers have to operate, including food-safe state and county certified cold storage facilities, and adequate utility services, e.g., water and power, to operate them; trucks and drivers for just-in-time product delivery; trained employees in food safety knowledge and distributors with available warehouses and drivers; and capabilities for sales and checkout operations either handled with cash or electronically. Regarding key interdependencies, the number one issue is having useable information. It can be confusing to have requests for assistance or resources from multiple authorities (e.g., the State and Regional Operations Centers and localities). Decisions on moving product and staff are not made by management at the individual retail stores but at the corporate level. In conclusion, he underscored that the ability to operate depends on regulatory authorities, transportation, and utilities.

***Rick Beatty, Vice President of Bay Area Materials, Lehigh Hanson***, provided an overview of the dependencies and interdependencies of the building materials industry from the perspective of the fourth largest producer of cement and largest producer of aggregates (crushed rock, sand, and gravel) in the world. Lehigh Hanson also produces ready-mixed concrete, asphalt, and a range of other building materials including precast concrete products, pressure and gravity pipes, pavers, tiles, and clay bricks. The corporation is a conglomeration of companies and assets, with many located in and serving the Bay Area. Lehigh Hanson products can be found in homes, roads, water systems, and other critical public and private projects from hospitals to airports, and will be essential in post-disaster repair and reconstruction of structures, roadways, bridges, and other infrastructure. Lehigh's Permanente plant, in operation since 1939, produces more than half the cement used in the Bay Area and more than 70% of the cement used in Santa Clara County. Much of this material is produced locally but other materials are imported. An example is materials for Bay Area bridges, which come from British Columbia. The biggest dependency is energy, which the building industry "uses tons of," including fuel, natural gas, and "anything that produces heat." Transportation is crucial to bring in and transport materials and product among facilities during the production and distribution process; Lehigh has an import terminal at the Port of San Francisco for its materials from Canada. He concluded with the observation that the industry is highly regulated, highly capital intensive, and competitive. However, in the aftermath of the Loma Prieta earthquake in 1989, local building materials companies did cooperate.

#### ***Interactive Discussion – Key Points Raised***

- Grocers need to include energy planning in continuity of operations plans.
- Small independent grocers rely on buying cooperatives, such as Unified Grocers.

- Non-profits that distribute food should be incorporated into regional food distribution planning for emergencies to ensure an orderly process.
- Caltrans and local jurisdictions have agreements in place with building materials contractors.
- For debris removal heavy equipment needs to be available; plans should be in place with the understanding that it may be necessary to improvise and rely on volunteers for debris removal.
- There are no standards for how to handle spoiled food waste, which may pose a public health threat. Localities have to decide whether to store in place or dump in certain locations. This needs to be worked out with public health officials on a case-by-case basis.

### **3.5. Working Lunch -Tracking Resources and Reports for Earthquake Recovery**

*Joseph Robinson, Vanir Technology Inc., Workshop Sponsor, with guest Mike Whelan, Salamander Technologies Inc.,* highlighted Vanir Technology capabilities to enable industrial and government clients to ensure the safety and security of their employees, visitors, and facilities. He provided a demonstration of technologies to identify and credential personnel, visitors, and volunteers through pre-loading information needed to assign, track, and manage resources into one ID card that can include all information on an individual from their name to relevant qualifications and medical history—whatever information is necessary.

### **3.6.Session 3Hospitals and Healthcare**

*Moderator: Paula Scalingi, Executive Director, Bay Area Center for Regional Disaster Resilience*

*Cheri Hummel, Vice President Disaster Preparedness, California Hospital Association,* provided insights into hospital interdependencies, preparedness gaps, and activities to address the challenges. She noted that California Hospital Association (CHA) is one of the largest hospital associations in the nation serving more than 400 acute care hospitals and health systems and representing 95 percent of the licensed hospital beds in California. TheCHA Hospital Preparedness Program has been established and sustained with federal grant funds for the past six years. Program staff provide emergency preparedness services and products to all hospitals statewide. This includes technical assistance, educational workshops, exercise planning tools, a dedicated website, meeting participation and advocacy. Program staff also foster relationships and partnerships among hospitals and health systems, community response partners, and local, regional and state emergency planning partners. In addition, they hold an annual Disaster Planning Conference for California hospitals, which this year is October 15-17, 2012 in Sacramento. Hospitals' disaster preparedness activities are subject to a number of regulations, including Centers for Medicare & Medicaid, Accreditation Standards, physical plant and physical structural requirements, and U.S. Health and Human Services Department grant requirements. The cost for hospital accreditation is substantial. The Joint Commission (TJC) accreditation requires a hospital to have a 96-hour plan that addresses the following six critical

areas: communications, resources and assets, security and safety, staff, utilities, and patient care. Additionally, hospitals are required to hold two drills a year. Like many businesses, hospitals rely upon just-in-time delivery of key supplies. Many hospitals and health systems are reviewing their vendor contracts and inquiring about their vendor's disaster plans. For example, how the vendor will prioritize competing requests, products and deliveries during a disaster. California regulations require hospitals to be self-sustainable for 72 hours. Organizational planning includes addressing personal preparedness. A critical surge capacity issue is how decisions will be made when the demand for patient care exceeds the resources and capabilities available.

Hummel said that important dependencies and interdependencies include: information and situational awareness; utilities—particularly water; supplies; personnel access post-event; and transportation (patient movement and evacuation). Regarding water dependencies, CHA is looking at how hospitals can store water. While some large hospitals can afford water storage, other hospitals can't and will need to rely on contracts with providers (proposed code would require every hospital to have a minimum 5000 gallon storage tank available to receive water). Identified preparedness gaps where support is needed include: fatality management; security resources; managing an influx of patients with limited staff; resources; capability (crisis care); decontamination capability; representatives with hospital operations knowledge and expertise should be placed in local, regional and the State operations' center. Lastly, exercises with multiple disciplines including the CA National Guard involved are key. CA has not experienced an event requiring mass patient movement; however, a catastrophic EQ in the bay area could prompt such an activity. CHA has developed an emergency food planning guidance toolkit will be released soon. Continuity of operations will be a key focus of the 2012 annual Disaster Planning Conference for California Hospitals. Looking ahead, CHA will be aligning its grant program to deal with decreased funding and focusing on capabilities-based planning and healthcare reform impacts on surge capacity.

***Ray Bonilla, IT Crisis Management and Business Continuity, Kaiser Permanente***, described Kaiser Permanente's integrated healthcare model to provide high-quality, affordable health care services and to improve the health of its members and the communities served. Kaiser Permanente maintains a four-star rating by the California Office of the Patient Advocate. Its physicians have been named top performers by the Integrated Healthcare Association for past six years. It is the nation's largest not-for-profit integrated health care delivery system, located in nine states and the District of Columbia and with nearly 8.9 million members, 36 hospitals, 533 medical offices, 16,000 physicians, and 168,000 employees that must coordinate and have shared standards. A major focus of Kaiser Permanente is transforming care delivery—empowering patients and members to manage their health care through technology. Areas where Kaiser Permanente is recognized for exemplary care include: clinical care, asthma, lung care, checking for cancer, diabetes care, heart care, maternity care, and mental health. A partial list of emergency management regulatory requirements for Kaiser Permanente include the Health Insurance Portability and Accountability Act (HIPAA), the Joint Commission, and Centers for Medicare & Medicaid Services (CMS)— and the California Department of Public Health

Bonilla noted that Kaiser Permanente was dependent on nearly all infrastructure systems — energy, water, transportation, communications, waste management, postal and shipping, supply

chains, healthcare and public health, other hospitals, food and agriculture, government services, manufacturing, media, community and particularly people— both staff and customers. Additional challenges include the need for coordinated communications—useful, actionable, and detailed information—from public and private sectors; the ability to build integrated actionable responses; cross-sector standardized protocols to leverage and/or share resources; balancing individual and community interests; legal requirements that do not take into account operational realities; and centralization of critical suppliers. Kaiser Permanente is working to mitigate the challenges, including promoting a common language in preparedness training—the NIMS/ICS framework, sharing emergency operations plans with community partners, inviting community partners to internal preparedness meetings, hosting joint planning forums and exercises, participating in various community groups and forums, plugging into credible information sources, and ensuring several layers of supplier redundancy. Steps taken include: building partnerships to bridge gaps between public and private sectors, improving communication channels and seeking first-hand information, championing solutions across sectors, hosting forums to review plans, lessons learned and after-action reports, participating in industry associations, meetings, and conferences, and sharing best practices.

***Michelle D. Heckle, Emergency Management/ Environmental Health & Safety Children's Hospital & Research Center at Oakland***, said Children's Hospital and Research Center is an independent and free standing healthcare provider that is responsible only to the Hospital Board. Children's Hospital specializes in children and is a Level 1 pediatric trauma center that has rehab services on-site and serves California children and children from other states and international locations. In 2011, the Hospital served 218,456 children (outpatient visits) and 10,255 hospitalized children (inpatients) during normal conditions. Trauma, neonatal and pediatric intensive care patients are transported within a 50 mile radius through use of emergency transportation, including helicopters. Children's Hospital uses its own tools for emergency management planning, and is prepared to deal with surge challenges including addressing four issues: staff, "stuff" (resources/equipment/ critical services and supply chains), space, and systems. The hospital is beginning to enhance communications through forming a Pediatric Care Coalition with other hospitals and public health, suppliers and transport companies. There is a need to examine emergency preparedness requirements and plans for children's care. One particular challenge is the influx of adults in a major emergency that could lead to blood bank depletion or other problems and, vice versa, an influx of children as adult hospitals. Another is the lack of skilled pediatric specialists and beds in a major disaster. Children's Hospital wants to increase area-wide hospital surge capacity and have other hospitals serve their less critical patients. The Hospital is undertaking a roadmap for a sustainable pediatric surge plan and network to supplement the surge plan the State has for the general patient population.

#### ***Interactive Discussion– Key Points Raised***

- A challenge in a major disaster is that individuals that don't require hospital assistance may go there anyway because the community knows that hospitals are open 24/7. Also due to regulatory requirements, hospitals are required to have their basic services on backup generators. Therefore, they may be one of the few resources with lights on in the community. Research from previous disasters shows that many injuries incurred during an event are not severe enough to require hospitalization. Many injuries are minor and

can be treated elsewhere. Hospitals should be preserved for the most severely injured or high acuity patients. Public education and awareness are necessary and training to volunteers could be provided for dealing with minor medical needs.

- Communities and government should be planning to establish alternate care sites to augment hospital and clinic services.
- During emergencies the Red Cross has an exemption for HIPAA information so they can be provided information from hospitals.<sup>2</sup>
- Most Alameda County hospitals are within two miles of the Hayward fault and there is one community below a dam.

### **3.7.Session 4 - Academic Institutions and Social Service Providers**

***Moderator: Monika Stoeffl, Monika Stoeffl Consulting***

***Tom Busk, Community Preparedness and Response, American Red Cross-Silicon Valley,*** spoke of the Red Cross mission to provide services and programs that help communities prevent, prepare for, and respond to emergencies. The Red Cross identifies and helps support programs that are run by churches or other groups to provide emergency services and conducts shelter operations training. The local chapter depends on neighboring chapters in disaster response and recovery. The Silicon Valley Red Cross is working with water utilities on a water restoration plan for the region. In the event of a major disaster, the Red Cross will support other groups in long-term recovery and then step down as VOADs move in to assist. The Red Cross works in partnership with other organizations, including local emergency management, and has a seat in the County EOC. An example of how the Red Cross works with local agencies is after

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<sup>2</sup> Providers and health plans covered by the HIPAA Privacy Rule can share patient information in all the following ways:  
TREATMENT. Health care providers can share patient information as necessary to provide treatment. Treatment includes: sharing information with other providers (including hospitals and clinics), referring patients for treatment (including linking patients with available providers in areas where the patients have relocated), and coordinating patient care with others (such as emergency relief workers or others that can help in finding patients appropriate health services). Providers can also share patient information to the extent necessary to seek payment for these health care services.  
NOTIFICATION. Health care providers can share patient information as necessary to identify, locate and notify family members, guardians, or anyone else responsible for the individual's care of the individual's location, general condition, or death. The health care provider should get verbal permission from individuals, when possible; but, if the individual is incapacitated or not available, providers may share information for these purposes if, in their professional judgment, doing so is in the patient's best interest. Thus, when necessary, the hospital may notify the police, the press, or the public at large to the extent necessary to help locate, identify or otherwise notify family members and others as to the location and general condition of their loved ones. In addition, when a health care provider is sharing information with disaster relief organizations that, like the [American Red Cross](#), are authorized by law or by their charters to assist in disaster relief efforts, it is unnecessary to obtain a patient's permission to share the information if doing so would interfere with the organization's ability to respond to the emergency.  
IMMINENT DANGER. Providers can share patient information with anyone as necessary to prevent or lessen a serious and imminent threat to the health and safety of a person or the public -- consistent with applicable law and the provider's standards of ethical conduct.  
FACILITY DIRECTORY. Health care facilities maintaining a directory of patients can tell people who call or ask about individuals whether the individual is at the facility, their location in the facility, and general condition. Of course, the HIPAA Privacy Rule does not apply to disclosures if they are not made by entities covered by the Privacy Rule. Thus, for instance, the HIPAA Privacy Rule does not restrict the American Red Cross from sharing patient information.

Hurricane Katrina, the Silicon Valley Red Cross set up a temporary community at San Jose State for displaced individuals and families.

Busk noted that a significant issue was the tendency over the last 10 years to outsource critical social service work, including disaster preparedness and management, to non-profits. These organizations may not have the resources to sustain the work. There is a Silicon Valley Fund for assisting non-profits in their emergency preparedness responsibilities. A committee has been set up to identify non-profits that require help.

**Alessa Adamo, Executive Director, SF CARD**, provided an overview of community service organization dependencies and interdependencies using SF CARD as an example. SF CARD was created in 1994 with a mission to provide disaster services to nonprofits and faith-based organizations after the Loma Prieta earthquake. SF CARD, because it is a training agency, does not have a large dependency on supplies or vendors. However, a major operational dependency is the need for accurate and timely information from trusted sources in an emergency to support its mission to push out information to the non-profit service sector. Other significant, related dependencies for sustainability are funding and retention of donated office space and equipment. SF CARD interdependencies focus on other community and social service non-profits, government agencies, and private sector organizations that have disaster preparedness missions, including the San Francisco Interfaith Council; the American Red Cross-Bay Area; regional intermediary agencies (CADRE, THRIVE, CARD); local government agencies (the San Francisco Department of Emergency Management, Human Services Agency, Department of Public Health, Mayor's Office on Disabilities, Neighborhood empowerment network, etc.); State agencies, such as California Volunteers and Cal EMA; federal agencies (FEMA Region IX, the U.S. Department of Homeland Security, Center for Faith-Based & Neighborhood Partnerships); and private sector organizations that focus on disaster preparedness (Building Owners and Managers Association of San Francisco and Business Recovery Managers Association).

Adamo said that SF CARD is addressing regional interdependencies challenges by creating cross-sector relationships. It has joined organizations such as BACSPP (Bay Area Cross Sector Partners in Preparedness), California Resiliency Alliance, and the Bay Area Center for Regional Disaster Resilience, and is working with private sector businesses throughout the Bay Area, and establishing contacts with Bay Area public sector disaster managers. SF CARD is addressing priority gaps through narrowing information gathering to the most trusted sources, assessing the accuracy and relevancy of the information, avoiding the potential for information overload, creating stronger cross-sector relationships, and accessing opportunities for exchanging information with these partners in an emergency. SF CARD is also focusing on proactive use of the various information-sharing platforms, such as Interagency Chatter, a social media information dissemination mechanism for the non-profit community.

**Stephen Stoll, Director, Office of Emergency Preparedness/Homeland Security, U.C. Berkeley**, pointed out that higher education facilities (universities, colleges, and community colleges) are dependent on most critical infrastructure sectors. In the case of the University of California at Berkeley, there are 50,000 people on campus each day and 2,000 to 3,000 visitors. The Campus has 2,347 acres and 324 buildings and is located on 10.5 square miles. The City of Berkeley (population 112,356) is bounded by the cities of Albany, Oakland, and Emeryville. The University has a Multi-Hazards Mitigation Plan that covers 24 types of incidents, including

technological incidents (hazmat release and radiological, chemical, and biological) and terrorist threats ranging from animal activists to bomb threats, explosions, and civil unrest. There is also a Campus Emergency Response Program, which is largely volunteer-based, and there is a University EOC that handles response and mitigation. The biggest threats are earthquakes and fire. The University's proximity to the Hayward Fault poses significant problems. In addition, the campus has mostly eucalyptus trees, which are highly flammable.

Stoll said dependencies and interdependencies include: the 350-plus different departments that are self-focused, facilities services, including utilities and supply chains, and reliance on the City of Berkeley services for fire, hazmat, and hospitals. Impacts to the University from a catastrophic event would affect not only teaching and research, but the community and local businesses that support its student population and activities. Concerns and solutions include identification of existing resources and gaps, awareness and acknowledgement of resilience and what resilience requires, identification of dependencies and interdependencies (a critical need), developing relationships and participation in meetings, groups, etc., that can help improve preparedness, establishment of memorandums and letters of agreement with utilities, contractors, and vendors, producing plans and procedures, and training. A particular concern is that the University has many historic buildings that are susceptible to earthquake damage and many casualties would be expected in an earthquake. Efforts are underway to promote coordination among the University's many independent departments, and a template has been developed for departments to fill out on their critical assets and functions. There is need to raise awareness within the departments on the need for disaster preparedness and resilience. There is a lot of great paper on the shelves but little participation and follow-on.

#### *Interactive Discussion– Key Points Raised*

- University coordination with local agencies is necessary and can help improve resilience, but in a major disaster, localities will take care of citizens first and academic institutions will be largely on their own.
- There is a need for more use of CERT Teams at universities and colleges.
- Disaster preparedness must involve international students and their parents.

## **4. Workshop Additional Outcomes**

The following results are based on participant views expressed during and after the workshop, participant evaluations, and other comments.

#### *Cross-Sector Collaboration*

- **Public-private-non-profit partnerships are important** in addressing interdependencies challenges of providers of essential goods and services and in enabling collaboration among emergency management at all levels of government and with public health and law enforcement.

- **Financial institutions are collaborating to increase security and resilience** and are working with cross-sector and federal, state, and local agencies in various partnership arrangements.
- **Non-profits that distribute food should be incorporated into regional food distribution planning** for emergencies to ensure an orderly process.
- **There needs to be greater coordination among state and local officials and between the unified command and affected local communities** starting early in the response and recovery process, and also for incorporation of local emergency response structures into contingency planning.
- Consideration should be given to adding a **local on-scene coordinator position** in the Unified Command structure.
- **University coordination with cities and counties** is necessary to improve resilience.
- There needs to be **greater coordination with the National Guard and military authorities** on disaster recovery planning and activities.

#### *Roles, Responsibilities, and Authorities*

- In instances where federal or state authorities take precedence on response and recovery actions and decisions, **affected localities should be engaged and involved in the decision-making process.**
- For many providers of essential goods and services, **decisions on where and how to provide services or move products and staff are not made by management at the individual organizations but at the corporate level.**

#### *Operation and Business Continuity Needs*

- Smaller financial institutions can handle localized emergencies and small events, but **will have problems responding and recovering from regional disasters.**
- For most providers of essential goods and services, a priority recovery issue is **having useable and accurate information and situational awareness.**
- Non-profits and businesses need to recognize that **even with memorandums of understanding with vendors, contractual arrangements may not be honored** for resources after a regional disaster.
- **Banks and other financial institutions will require staff to resume business.** Certifying personnel to gain access to work locations to resume operations remains a key issue.

- **The trend to out-source to social service organizations disaster preparedness and management has created a significant vulnerability** in that these organizations in an era of budget constraints may be unable to sustain these efforts.
- There is a need to **assess and improve emergency preparedness requirements and plans for childrens' care.**
- In a major disaster, **academic institutions with large student resident populations will be largely on their own** in addressing post disaster challenges.

#### *Interdependencies-Related Impacts and Resilience Gaps*

- There needs to be **greater focus on interdependencies of providers of essential goods and services** as well as those associated with utilities and transportation. These organizations are dependent upon most of the other infrastructure sectors.
- **Businesses are dependent on financial services** for credit and money, loans and financing for rebuilding.
- **Re-fueling emergency power generators will be a major concern.** To conserve emergency power, banks will shut down certain operations and locations.
- Only a few larger banks have mobile ATMs. **Credit Unions and local financial institutions will need to partner to share ATMs and branches.**
- Smaller banks and credit unions don't customarily have a lot of extra cash on hand and in a major emergency **it may take a week to get the necessary cash infusion.**

#### *Regulatory Issues*

- **Most providers of essential goods and services are subject to regulatory requirements that may help or hinder post-disaster capabilities to resume business.** These include legal requirements, policies and standards that govern operations, health and safety, privacy, emergency preparedness, etc.

#### *Public Information, Education and Training*

- Local governments and providers of essential goods and services need to **educate the public** on what conditions they can expect post-disaster that directly impact their ability to resume operations.
- **Cross sector exercises** are necessary to illuminate interdependencies gaps and potential mitigation measures.
- The public needs to be made aware that **hospitals in a major disaster or event will only be able to assist the seriously injured.** The public also needs to have information post-disaster of what hospitals are available and where open health centers and medical clinics are located.

- Within universities and other large organizations where departments and offices are autonomous, **awareness needs to be raised about resilience and preparedness** and the need for a coordinated approach to planning, response, and recovery.

*Issues and gaps participants recommended for inclusion in the Action Plan:*

- The capability for regional mapping of critical infrastructure and essential service providers to enable assessment of consequences, including economic impacts and monetary loss, and informed decision-making;
- The need for public education through raising awareness and getting citizens involved in preparedness improvements;
- The need for clear guidance for disaster volunteers;
- Engagement of communities at the neighborhood level in disaster preparedness;
- Necessity of focusing on long-term impacts and recovery;
- Inclusion of “victim of loss” in recovery boards, councils, and committees to make sure their views are factored into recovery decisions;
- Outreach to and education of elected officials on disaster recovery issues and needs; and further examination of lessons learned associated with infrastructure interdependencies from past events.

## 5. Next Steps

Participants were told they would be provided a summary of the workshop and were asked to note on their evaluations if they wished to join the Planning Team for the final event in the Bay Area Disaster Resilience Initiative to be held in October or November 2012.

All materials from this and previous workshops are available at <http://quake.abag.ca.gov/resilience/workshops>.

## Appendix A

### WORKSHOP PARTICIPATING ORGANIZATIONS

Adjusters International	Lehigh Hanson
Alameda Health Consortium	Marin County Sheriff's Office, OES
Aloft Consulting	Marin Interagency Disaster Coalition (Marin VOAD)
American Red Cross	Monica Stoeffl Consulting
Amtrak	Mountain View Fire Department
Applied Materials	Northern California Regional Intelligence Center (NCRIC)
Association of Bay Area Governments	The National Disaster Resiliency Center
AT&T	NDRC Learning Center
BARCfirst	Nexis Preparedness Systems
BART	Orbelian Holdings, L.P.
The Baruch Group	Port of Oakland
Bay Area Center for Regional Disaster Resilience	San Carlos/Redwood City Fire
Bay Area Council	SF CARD
California Department of Public Health	San Jose Water Company
California Emergency Management Agency	San Mateo County OES
California Energy Commission	Sandia National Laboratories
California Grocers Association	Santa Clara County
California Hospital Association	Santa Clara Valley Water District
California Resiliency Alliance	Second Nature
Children's Hospital & Research Center Oakland	Sonoma County Fire and Emergency Services Department
Citizen 911	South Bay Regional Public Safety Training Consortium
City of Mill Valley	Technology Credit Union
City of Palo Alto	The Greenspan Co./Adjusters International
City and County of San Francisco	UC Berkeley
• Department of Emergency Management	• School of Public Health, Center for Infectious Disease Emergency Readiness
• SFFD NERT	Urban Resilience Strategies
City of San Jose	URS
• Office of Emergency Services	U.S. Department of Homeland Security
City of San Ramon	U.S. Environmental Protection Agency
City of Santa Clara	Valley Transportation Authority
Contra Costa County	Vanir Technology
Facebook	Verizon Wireless
GeoHazards International	WGU
Healthchek LLC	
ICF International	
IntTerra	
Jeanne Perkins Consulting	
Kaiser Permanente	
Lawrence Berkeley National Laboratory	

## Appendix B Agenda

### *Infrastructure Interdependencies Workshop II— Interdependent Essential Goods and Service Providers May 2, 2012 | Applied Materials, Santa Clara*

- 8:30 a.m. Registration**
- 9:00 a.m. Welcome and Introductions**
- State/Local Perspectives**
- Christina Curry, Assistant Secretary of Preparedness, Cal EMA
  - Janell Myhre, Director, Santa Clara County Office of Emergency Services
- 9:20 a.m. Interdependencies II Workshop Overview**
- Danielle Hutchings, Earthquake and Hazards Program Coordinator, Association of Bay Area Governments
- 9:40 a.m. Banking and Financial Institutions***(Moderator: Peter Ohtaki, Executive Director, California Resilience Alliance)*
- Barry Cardoza, LLC for BARCfirst
  - Mike Luckin, TechCU
- Interactive Discussion*
- 10:45 a.m. Break**
- 11:00 a.m. Essential Goods and Services***(Moderator: Danielle Hutchings, ABAG Earthquake Hazards Program Coordinator)*
- Timothy James, Government Relations, California Grocers Association
  - Mike O'Brien, Port Facilities Security Officer, Port of Oakland
  - Rick Beatty, Vice President of Bay Area Materials, Lehigh Hanson
- Interactive Discussion*
- 12:00 p.m. Working Lunch: Tracking Resources and Reports for Earthquake Recovery**  
*Joseph Robinson, Vanir Technology, Workshop Sponsor with guest Mike Whelan, Salamander Technologies Inc.*
- 1 p.m. Hospitals and Healthcare***(Moderator: Paula Scalingi, Executive Director, Bay Area*

*Center for Regional Disaster Resilience)*

- Cheri Hummel, Vice President Disaster Preparedness, California Hospital Association
- Ray Bonilla, Manager Crisis Management and Business Continuity, Kaiser Permanente
- Michelle D. Heckle, Emergency Management/ Environmental Health & Safety  
Children's Hospital & Research Center at Oakland

***Interactive Discussion***

**2:00 p.m.**      **Academic Institutions and Social Service Providers** (*Moderator: Monika Stoeffl, Monika Stoeffl Consulting*)

- Tom Busk, Community Preparedness and Response, American Red Cross-Silicon Valley
- Alessa Adamo, Executive Director, SF CARD
- Stephen Stoll, Director, Office of Emergency Preparedness/Homeland Security, U.C. Berkeley

***Interactive Discussion***

**3:00 p.m.**      **Next Steps**

**3:30 p.m.**      **Adjourn**

## **Appendix C**

### **Planning Team Members**

Stephen Baruch	Nexis Preparedness Systems
JoAnna Bullock	Association of Bay Area Governments
Darryl Burton	Business Recovery Managers Association
Steve Dennis	Alameda County Water District
Danielle Hutchings	Association of Bay Area Governments
Gerald Kiernan	Bay Area Center for Regional Disaster Resilience
Catherine Lyons	Bay Area Council
Katie Martinez	San Francisco Public Utilities Commission
Peter Ohtaki	California Resiliency Alliance
Nancy Okasaki	Metropolitan Transportation Commission
George Orbelian	Project Kaisei
Paula Scalingi	Bay Area Center for Regional Disaster Resilience
Monika Stoeffl	
Edward Sullivan	East Bay Municipal Utility District
Kay Vasilyeva	City and County of San Francisco, DEM
Jim Wollbrinck	San Jose Water Company

## **Appendix D**

### **Infrastructure Interdependencies Backgrounder**

In the past decade across the nation, the critical infrastructures and other essential service providers that enable our communities to thrive and grow have become increasingly interconnected and interdependent. These infrastructures include energy (electric power, natural gas, fuels); telecommunications, transportation (rail, road, maritime); water and water treatment systems; banking and finance; emergency services; government services; hospitals, healthcare and public health; agriculture and food; commercial facilities; nuclear reactors; materials and waste; dams and levees; manufacturing; chemical facilities; and postal and shipping. To a large degree, this trend towards ever greater linkages has been created by our growing reliance on electronic systems, computer processing and the Internet for managing and operating these infrastructures. This interconnectivity and the resulting interdependencies can exist at multiple levels of increasing complexity and extend beyond a community, a state, and nations, creating unexpected vulnerabilities and significant consequences.

Although emergency and business continuity practitioners are beginning to focus on interdependencies, we remain limited in our understanding of them, the vulnerabilities they create, and how to prevent or lessen their impacts. Disruptions in one infrastructure can cascade, ultimately affecting more than one infrastructure, affecting essential government services, businesses, and individuals in an entire region with far-reaching health and human safety, economic, environmental, and national security consequences.

#### **Examples of Infrastructure Dependencies and Interdependencies**

Water and waste water systems, are dependent on a wide range of infrastructures and other essential services, including electric power to run pumps and control systems, petroleum fuels for transportation of repair and maintenance personnel, communications to handle the ordering of chemicals and other supplies and equipment and to direct operations, all modes of transportation for supply and shipping, and financial systems to support billing, payments, and other business services. Likewise electric power utilities depend on natural gas, coal, and petroleum to fuel generators, as well as on road and rail transportation to deliver fuels to the generators, water for cooling and to reduce emissions, and telecommunications to monitor system status and system control, e.g., Supervisory Control and Data Acquisition (SCADA) systems and energy management systems.

Similarly, other infrastructures depend on water and electric power and other infrastructure services.

- Computer, process control, telecommunications, and other systems that run infrastructures depend upon water for cooling. Water systems may require electric power for operating pumps and need logistics and transportation for supplying water treatment chemicals.
- Natural gas fuels critical gas-fired generators in the electric power system. Electric power in turn may be required to operate the critical systems that are essential for delivering gas (e.g., control systems, storage operations, and compressor stations).

- A substation in an electrical distribution system can provide electric power to a key telecommunications switching center, and rail transportation depends on electric power for signaling, crossing protection, monitoring, and other terminal operations. Under certain conditions, failure or loss of power in a substation, for example, directly affects operations at a telecommunications switching center.
- The telecommunications center, in turn, supports SCADA systems for natural gas and oil pipelines, as well as electric power, water, and transportation systems that support electric power.
- Agriculture and food processing, warehousing and distribution, and manufacturing are dependent on all the major infrastructures, for example power for processes and refrigeration, communications for shipping and logistics, all modes of transportation for shipping materials and products, and financial systems to support purchasing of materials and sales of goods.

When infrastructure failures occur and repair crews and replacement components are needed, service providers also depend on other infrastructures, including telecommunications/IT, petroleum fuels (for vehicle and emergency generator fuel), road transportation, and, in some cases, rail transportation. Other dependencies, because of their location or exposure to the environment, are not physically linked but are coupled. A common utility corridor that consists of overhead or underground electric power transmission and distribution lines, underground pipelines, and telecommunications cables dramatically illustrates such dependencies. In many instances, multiple infrastructure assets that are co-located, for example along bridges, roadways, or in a single location, can increase susceptibility to and likelihood of simultaneous outages due to physical hazards, such as a flood, explosion, fire, and earthquake, as well as sabotage.

Another type of dependency can exist in complex systems without a direct link. The failure of a substation, for example, can lead to reconfiguration of the electric network, which, in turn, can overload a similar substation within the system if the demand exceeds capacity. In such cases, a direct link usually does not exist, and the failure occurs only when certain conditions are imposed (e.g., maximum load conditions). Natural hazards, such as earthquakes or extreme weather conditions, clearly show how threats can affect multiple infrastructures at the same time. Such threats also reveal interdependencies that can complicate or delay response and mitigation or recovery of a particular infrastructure from an incident.

### **Why a Holistic Regional Risk Mitigation Approach is Important**

Because these dependencies and interdependencies remain little understood, the emergency management and continuity of operations plans of critical infrastructures, other service providers, and businesses are at best adequate to address localized disasters and not major incidents and disasters with regional consequences, including supply chain disruptions. These plans do not take into account extensive and prolonged impacts that may include disruption or destruction of critical components, systems, and facilities, causing outages of weeks or months, and shortages of supplies, personnel, and capabilities to restore critical services. Such widespread and prolonged service disruptions can cause huge regional economic and psychological impacts that can significantly diminish commerce and cause the relocation of residents in affected communities. At the same time, economic constraints pose additional

challenges for states, localities, and stakeholder organizations, which have limited manpower, funds, and technical expertise to assess all-hazards vulnerabilities from interdependencies, and identify and remedy them.

Whether a natural disaster, manmade incident, or pandemic, there is clearly a need for a holistic regional strategy to improve the resilience of our infrastructures and other essential services, as well as the communities and regions that depend upon them. This all-hazards, multi-jurisdiction, cross-sector approach to preparedness and resilience includes detection, prevention, mitigation, response, recovery/restoration, training, exercises, and community outreach. It requires utilities and other service providers to examine external linkages that affect their operational and business continuity. It also necessitates bringing together local public, private, and non-profit stakeholders with state and federal partners in collaboration to share information and understand and address regional vulnerabilities and consequences posed by infrastructure interdependencies.