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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

Case No.: 20STCV22690

BERN BISCHOF, an individual, MARKUS BISCHOF, an individual, JOSEF BISCHOF, an individual, CYNDIE KASKO, an individual, and JASON KASKO, an individual,	**COMPLAINT AND DEMAND FOR JURY TRIAL** 1. Negligence 2. Strict Products Liability

Plaintiffs,

vs.

SOUTHERN CALIFORNIA EDISON COMPANY, a California Corporation, and DOES 1-100 inclusive,

Defendants.

3. Negligent Products Liability

4. Private Right of Action Pursuant to Public Utilities Code § 2106

5. Negligent Infliction of Emotional Distress

I. INTRODUCTION

1. Southern California Edison Company ("SCE"), is one of the nation's largest electric utilities, operating a massive transmission and distribution system that delivers billions of kWh on a yearly basis to more than 15 million people throughout 50,000 square miles of service area. SCE's operation includes more than 700,000 transformers, which convert high voltage electricity to smaller voltages that can be used in restaurants and homes throughout Southern California.

2. Those transformers are located in various areas throughout SCE's service territory, including in underground vaults below public spaces. But those underground vaults carry a terrifying secret. When they fail—and they can fail catastrophically—SCE admits they can "have very serious consequences. . .to members of the public." For the underground vault located below the outdoor dining area at Old World German Restaurant—a vault SCE knew was dangerous, with nearly a decade of issues and one employee describing it as a "death trap" in 2018—that danger would become all too real.

3. Despite the well-known risks associated with underground transformers, including the risk of catastrophic explosion, SCE failed to properly maintain, inspect,

repair, and replace that underground transformer vault—doing nothing to prevent a massive transformer explosion. One year later, Plaintiff Bern Bischof ("Bernie") would unfortunately fall victim to SCE's blatant disregard of public safety, and nearly lose his life to the "death trap" SCE left lingering in its underground transformer vault.

4. On October 5, 2019, in the middle of a crowded Oktoberfest celebration at Old World in Huntington Beach, California, an SCE underground transformer exploded—engulfing Bernie in flames, and leaving nearly half of his body covered in second and third degree burns. Bernie would require numerous skin graft procedures to repair much of the damaged tissue that extended from his head to the bottom of his legs. He was diagnosed with third degree burns to his arms, hands, legs, trunk, and back—meaning all layers of his skin were destroyed. Bernie also suffered burns on his head and face. Photographs that provide a glimpse into his tragedy are included below:

5. Bernie's family suffered as well. Four of Bernie's family members percevied the incident, sustaining injuries themselves while watching in horror as their family member Bernie caught fire and burned: Markus Bischof (Bernie's son), Josef Bischof (Bernie's father), Cyndie Kasko (Bernie's sister), and Jason Kasko (Bernie's brother-in-law). The transformer explosion has changed all of their lives forever.

6. Sadly, the transformer explosion was preventable. It resulted from years of shoddy maintenance, cursory and ineffective visual inspections, and a refusal to upgrade aging equipment, practices that reflect SCE's company-wide policy of placing profits over public safety. At least as early as 2010, the underground transformer vault at Old World began to experience a host of safety issues that included smoking, vibrating, buzzing, rattling, and even an explosion in June 2010—clear indications that the equipment is failing. Despite knowing about those warning signs, SCE chose to ignore the safety risks associated with its 25-year-old transformers—refusing to replace, relocate, or repair the transformers contained within the underground vault, all the while falsely reassuring Bernie and his family, who own and operate Old World, for *years* that the transformers were safe.

7. The issues with the underground vault below Old World did not end there. SCE refused to conduct even basic maintenance on the transformer bank, such as the routine, straightforward task of checking the oil level. In addition, SCE did not pursue its 2010 public safety initiative to address the dangers of underground equipment with respect to Old World, and SCE ignored warnings from Bernie, who pled with SCE in 2015 to move the transformer "before someone gets blown up in the event of another problem with the transformer."

8. This tragedy was not an isolated incident. In the ten years before the explosion that nearly took Bernie's life, SCE had been fined $86.5 million for electrical and fire related incidents, and had numerous underground transformers catastrophically explode. By way of brief, and horrifyingly recent, example: (1) five people were hospitalized with burn injuries when an underground SCE transformer

vault in Long Beach exploded; (2) another SCE transformer vault exploded in Ventura; and (3) on Black Friday, there was an explosion in SCE's underground electrical vault at South Coast Plaza, one of Southern California's most popular malls. These incidents, in addition to the highly-publicized wildfires caused by SCE's aging equipment and failure to perform proper maintenance, highlight SCE's corporate-wide policy of placing its own financial interests far above public safety.

9. Now, seven months later, Bernie is left with painful physical injuries, disfiguring scars, and emotional trauma that will last a lifetime. Even worse, the blast caused significant brain damage and permanent cognitive deficits that will never improve. Bernie, a 60-year-old single father, widowed when he lost his wife to cancer in 2017, is now more susceptible to developing dementia as a result of his brain injury. This is the new harsh reality for Bernie, who is left to worry about his future, about who will care for his sons, and if he will become a burden on his boys as he ages.

II. THE PARTIES

10. Plaintiff, Bern Bischof is, and at all relevant times was, a resident of the County of Orange, State of California. He is represented by the law firm of Bentley & More LLP.

11. Plaintiff, Markus Bischof is, and at all relevant times was, a resident of the County of Orange, State of California. Markus Bischof is the son of Bern Bischof. Markus Bischof is represented by the law firm of Panish Shea & Boyle LLP.

12. Plaintiff, Josef Bischof is, and at all relevant times was, a resident of the County of Orange, State of California. Josef Bischof is the father of Bern Bischof. Josef Bischof is represented by the law firm of Panish Shea & Boyle LLP.

13. Plaintiff, Cyndie Kasko is, and at all relevant times was, a resident of the County of Orange, State of California. Cyndie Kasko is the sister of Bern Bischof. Cyndie Kasko is represented by the law firm of Panish Shea & Boyle LLP.

14. Plaintiff, Jason Kasko is, and at all relevant times was, a resident of the County of Orange, State of California. Jason Kasko is the brother-in-law of Bern Bischof. Jason Kasko is represented by the law firm of Panish Shea & Boyle LLP.

15. Plaintiffs Bern Bischof, Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko jointly bring this Complaint.

16. Defendant, Southern California Edison Company is, and at all relevant times mentioned herein was, a California corporation licensed to conduct business or conducting business in California, through its agents and/or employees, and is the alter ego and/or joint venturer of other corporations, entities, and business interests, each of which is conducting business in the County of Los Angeles, the State of California. SCE is an investor-owned public utility with its principal place of business in the City of Rosemead, County of Los Angeles, State of California.

17. The true names and capacities, whether individual, corporate, associate or otherwise, of Defendants Does 1-100, inclusive, and each of them, are unknown to Plaintiffs, who thereby sue these Defendants by such fictitious names, and will ask leave of this court to amend this complaint when the true names are ascertained.

18. Plaintiffs are informed and believe and on that basis allege that each Defendant named herein as a Doe is responsible in some manner for the events and happenings referred to herein which proximately caused injury to Plaintiffs as hereinafter alleged.

19. Plaintiffs are informed and believe and on that basis alleges that at all times mentioned herein the Defendants, and each of them, were the agents, servants, employees, and joint venturers of each other, and were as such acting within the course, scope and authority of said agency and employment and or joint venture, and that each and every Defendant, when acting as a principal, was negligent and reckless in the selection, hiring, entrustment and supervision of each and every other Defendant as an agent, servant, employee, or joint venturer.

III. FACTUAL BACKGROUND

A. Background of SCE and its longstanding history of ignoring public safety

20. SCE is an investor-owned public utility registered with the California Public Utilities Commission (CPUC), and subject to the California Public Utilities Code as well as rules and regulations set forth by the CPUC. SCE is a California company with its principal place of business in the City of Rosemead, County of Los Angeles, State of California. SCE is one of the nation's largest electric utilities, and has operated in California since 1909. SCE serves over 15 million residents over 50,000 square miles.

21. Recently, SCE received negative media attention for its role in causing the California wildfires and mudslides that resulted in loss of life and widespread destruction to homes and businesses. In March 2019, it was confirmed by the Ventura County Fire Department that SCE equipment caused both the Thomas Fire and the Koenigstein fire. In addition, there are still ongoing safety issues with SCE transformers and underground electrical vaults leading to explosions, including the November 2018 Long Beach vault explosion that sent five people to the hospital, an October 20, 2019 underground vault explosion in Ventura, and the 2019 Black Friday underground electrical vault explosion at South Coast Plaza in Costa Mesa. These incidents highlight SCE's corporate-wide failures, including its poor maintenance and inspection practices. Unfortunately, these incidents are not a new occurrence for SCE, with a history of company failures dating back many years. The CPUC highlighted some of those failures during its 2015 investigation of SCE's widespread outages in Long Beach. The Safety and Enforcement Division of CPUC noted serious neglect and deterioration of SCE's Long Beach equipment, which it attributed to SCE's inadequate knowledge of its own system, inadequate inspection and maintenance activities, and inadequate training for people tasked with working on its equipment.

22. In its role as both an electrical corporation and public utility pursuant to sections 218(a) and 216(a) of the Public Utilities Code, SCE provides electricity to

businesses and residents throughout Southern California, including the Old World Village, and its German Restaurant in Huntington Beach, California.

B. Bernie Bischof and his family

23. Born and raised in a close-knit Southern California family, Bernie grew up with his father Josef, mother Dolores, and younger sister Cyndie. His father, who came to America in 1952, had a passion for building, and Bernie has fond childhood memories of the family business, fixing up old homes with his father and working on a variety of building projects. Reflecting his love of soccer, Josef Bischof's first project was constructing a soccer field in Torrance. He passed that love down to his son, Bernie. At the age of six, Bernie played soccer with his friends on the field his father built and has been a lifelong fan.

24. A few years later, in 1968, Josef created and built Alpine Village—a destination for shopping and dining in Torrance, California, which includes German markets, shops, a fairy tale land, and petting zoo. As a child, Bernie looked up to his father, hoping to be just like his dad one day. Even at a young age, Bernie knew that he would join the family business and carry on his father's legacy. At the age of 10, Bernie began working at Alpine Village bussing tables and serving pretzels.

25. In 1977, after graduating from high school, Bernie helped his father Josef build his next creation—Old World Village—a traditional Bavarian-style community in Huntington Beach, with cobblestone streets and vibrant murals of Josef's homeland. Old World Village offers unique European dining, housing, and shopping, including several homes, a church, shops, and the Old World German Restaurant. In 1978, Old World Village opened its doors. Bernie has worked there with his younger sister, Cyndie, and father, Josef, for many years. A glimpse of the Old World Village is included on the next page. For over 40 years, Old World Village has been a valued staple of the Huntington Beach community, allowing families to experience a taste of

German culture right here in Southern California, including, of course, a popular Oktoberfest celebration.

26. In 1992, while traveling in Austria, Bernie met his soulmate, Barbara. Although distance initially kept them apart, a few years later Bernie received a birthday card from Barbara, which led to a visit in Austria, and ultimately the two began dating. In 1996, Barbara visited Bernie in the United States and the two traveled throughout California together. The visit only lasted two weeks, but Bernie knew she was "the one." He purchased a ring and gathered more than 100 friends and family for a surprise engagement party. The night before Barbara was scheduled to return to Austria, Bernie proposed. They married in May of 1997 and Barbara joined Bernie in Huntington Beach.

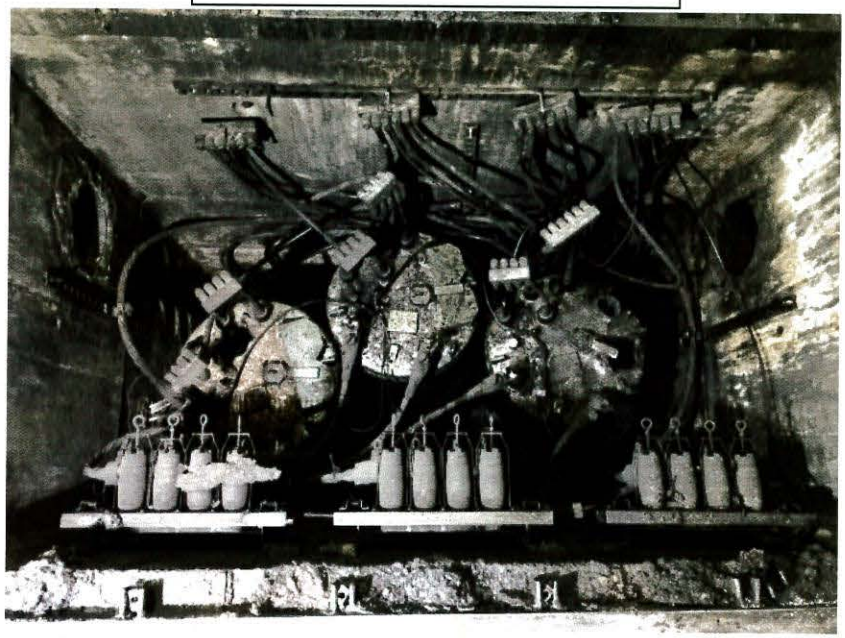
27. The couple had two sons, Matthaeus and Markus, currently ages 18 and 21. Bernie and his wife continued growing the family business, working at Old World with their boys. The family enjoyed annual trips to Austria and Germany, where they would visit Barbara's family. In 2013, Barbara was diagnosed with breast cancer. She fought the disease for several years, but sadly, passed away in 2017. It was a devastating loss for the entire Bischof family.

28. In 2019, at the age of 59, Bernie continued to manage and run Old World Village with the help of his sister Cyndie. He enjoyed spending time with his sons and his passion for sports continued, including a love of skiing, snowboarding, and Pilates. Bernie and his family were very close, leaning on each other after losing their beloved Barbara, a devoted wife, mother, and friend.

C. The Old World transformer vault and its ten-year history of problems

29. The Old World German Restaurant at Old World Village includes an indoor dining space as well as an outdoor patio where guests can enjoy their meals while watching sports on the big screen TVs. On the patio, just outside a door that provides access to the interior of the restaurant, there is a SCE underground transformer vault. This vault contains three 50kVA transformers (kVA means "Kilovolt-Ampere" and the size of a given transformer is determined by the kVA load)—collectively referred to as a transformer bank. The power entering the vault travels from the "Team" substation located at the nearby Westminster SCE facility, via both above-ground and below-ground power lines to the vault. Transformers are used to increase and decrease voltages and currents in an electrical circuit. The SCE transformers at issue convert high-voltage electricity input to low-voltage output that can be used in homes or businesses, like the Old World German Restaurant. The voltage entering the Old World vault is 12,000 volts, which the transformer reduces to 120 volts. All three transformers are oil immersed or liquid type transformers, meaning they are filled with mineral oil that is intended to act as a cooling agent. A photograph depicting an overhead view of the interior of the vault and three transformers is included on page 12.

Old World Transformer Vault



30. The three transformers within the Old World vault were manufactured by General Electric ("GE") in 1994 and installed by SCE in the underground vault that same year. In the years that followed, this transformer bank experienced a host of issues dating back to at least 2010—the first time the transformer exploded. Over the years, SCE was notified of and documented multiple problems with these aging transformers, including:

June 2010 Explosion

- **June 22, 2010 -** The underground transformer vault *exploded* and caused fire damage, depicted at right. Thankfully, the restaurant was closed and no one was injured. SCE did not replace the transformers following the explosion.
- **October 17, 2015 -** Bernie notified SCE that he smelled burning and smoke near the transformer on the patio.

- **November 5, 2015 -** In a letter to SCE, Bernie requested that SCE remove the transformer from his property and relocate it, "Before someone gets blown up in the event of another problem with the transformer."
- **November 16, 2016 -** Cyndie notified SCE that the transformer grate was vibrating and caving in, and that she was concerned for the safety of her restaurant and wanted the vault removed.
- **February 18, 2017 -** Cyndie notified SCE that there was again an issue with the transformer—she heard a buzzing noise and reiterated her request to have the transformer removed off her property because it had exploded in the past.
- **November 24, 2017-** Bernie notified SCE that he heard a noise that sounded like rattling chains and arcing inside the transformer.
- **September 7, 2018 –** Old World employees notified SCE that the lights were not working.
- **June 6, 2019 -** Cyndie notified SCE that the underground transformer was making a dangerous sound. Just months later, the transformer would explode, causing massive burns to Bernie, leaving him with physical and emotional scars that will last a lifetime.

31. Rattling, buzzing, and vibrating within a transformer bank are indications that the equipment is failing and requires immediate inspection. Each time SCE was called to Old World to address these safety concerns, it was placed on notice that a catastrophic failure of its aging transformers was inevitable, and that immediate repair or replacement of the transformer was required. Instead of taking action to protect the public, SCE chose to lie to the Bischofs and falsely reassure them that everything was fine, okay, and safe.

32. In addition to SCE's numerous visits to the site for safety issues, Bernie also wrote to SCE outlining his concerns, in a letter dated November 5, 2015. There, he reminded SCE of the ongoing issues, which included a recent incident in which the transformer started smoking, resulting in power outages, and the previous 2010

explosion. Bernie concluded the letter by pleading with SCE to relocate the transformer "before someone gets blown up in the event of another problem with the transformer." Despite the numerous concerning issues with the transformers in its vault, SCE refused to relocate them. Worse, SCE would not even replace the transformers, even though the estimated cost of new liquid-filled mineral oil transformer is only about $3,700, a small cost in its $64 billion empire. (Bernie's November 5, 2015 letter to SCE is attached as Exhibit 1.)

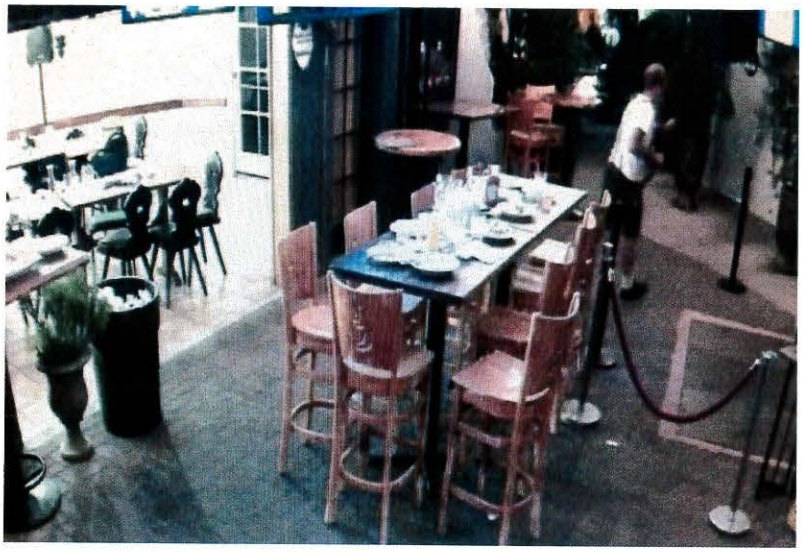
33. Although SCE uses underground equipment, like the transformers at issue in this case, a large portion of the equipment within its distribution network is above-ground, including many transformers. As of August 2, 2010, about two months after the first Old World transformer vault explosion, SCE implemented an Above-Ground Equipment Initiative, which put into place SCE's new rule that it would no longer accept designs from residential, commercial, or industrial customers that call for new electrical equipment to be installed in underground structures. SCE stressed three main goals driving this policy change; the first was increasing worker and public safety. In documents generated by SCE announcing this change, it acknowledged that "[e]lectrical components such as transformers and fuses sometimes fail. Failure in a confined underground space such as a vault can have very serious consequences to utility employees working in that confined space and possibly to members of the public nearby." (SCE Above-Ground Equipment Initiative FAQs.)[1]

34. Despite SCE's change in policy, multiple requests by Bernie and Cyndie to relocate the transformer, and service calls year after year, as of October 2019, the three 25-year-old transformers remained within the Old World underground vault, a vault witnesses heard SCE's own employee describe as a "death trap" in 2018. Unfortunately, Bernie would become ensnared by this trap less than a year later.

[1] https://www.sce.com/sites/default/files/inline-files/100730_AGEInitiativeFAQs.pdf

D. The October 5, 2019 explosion that changed Bernie's life

35. On October 5, 2019, Bernie's life changed forever. While the Old World Village was bustling with patrons for the annual Oktoberfest celebration, the restaurant began experiencing power issues. At the same time, Bernie noticed a burning smell outside the restaurant, near the SCE transformer vault. Knowing the vault's history and out of caution for everyone's safety, he immediately cleared the area of any patrons and locked the door to prevent patrons from dining on the patio. Without Bernie's quick thinking, many others would have been seriously injured or killed. A security camera captured Bernie clearing the area, pictured below.



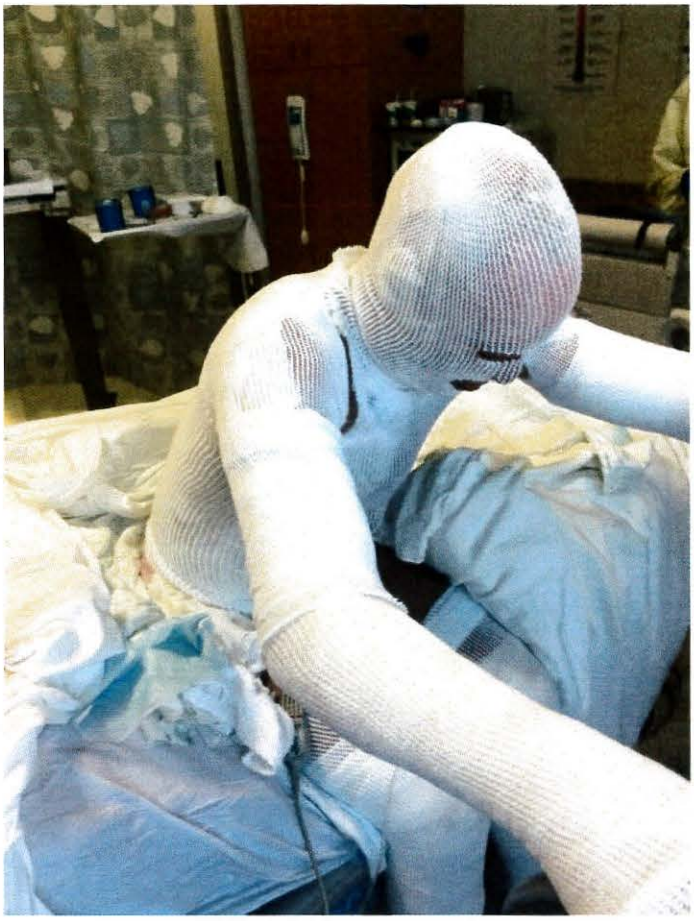
36. Cyndie immediately called SCE to notify them of the problem and was instructed to contact the fire department. She called 911, and shortly thereafter, the fire department arrived on site and asked Bernie to walk them to the transformer area. At approximately 8:15 p.m., as he approached the area of the vault with 2 Huntington Beach firefighters, the SCE transformer ***exploded***. Bernie suddenly felt a rush of heat, and the blast knocked him to the ground. Flames ignited his clothing and he could feel his arms and legs sizzling. Terrified, and still burning from the flames that consumed his clothing and skin, he attempted to escape the flames. Bernie ran through the restaurant and out of the front door, where he fell to the ground while others worked to extinguish the flames still engulfing him. Shocked, he looked down to see his melted

skin falling off his arms and legs. Bernie lay moaning in searing pain. He felt dizzy, and his hands were throbbing. Even more horrific, his son Markus, his 89-year-old father Josef, his sister Cyndie, and his brother-in-law Jason witnessed this traumatic event. When Bernie saw his eldest son Markus sobbing, his entire focus shifted to his son. He knew that he had to be strong, reassuring Markus that he would be okay and pleading with others to tell his son that he would be fine.

37. Paramedics arrived and doused Bernie's skin with water before he was rushed to UCI Medical Center. When he arrived at the UCI Medical Center Burn Unit, doctors determined that he had sustained burns to *nearly half of his body*—with 41% of his body covered in burns. Doctors evaluated his injuries and determined the damage to his left arm, left hand, left leg, right arm, back, flank, and right leg was so extensive that multiple significant and painful procedures would be necessary to treat these burns. Specifically, Bernie would require skin graft procedures to repair much of the damaged tissue that extended from his head to the bottom of his legs, as he was diagnosed with third degree burns to his arms, hands, legs, trunk, and back, meaning all layers of his skin were destroyed. Bernie was also burned on his head and face. He had several burn areas that were deep, and a mixture of deep dermal and full thickness burns, requiring staged surgeries for the wound bed preparation and eventual coverage. Without surgery, the burns would lead to sepsis, severe scarring, contractures, and loss of function.

38. Although paramedics administered Fentanyl for pain, and UCI continued with pain medication, nothing seemed to alleviate his pain, which was made even worse with any small movement or touch. He was admitted to the Burn Intensive Care Unit (ICU) to receive ongoing treatment.

39. While in the ICU, doctors immediately started with wound care, which involved scrubbing and scraping off his damaged tissue. This long process was excruciating. Next, he was taken to a large bathtub, where he was rinsed off with water, and then bandaged from head to toe. His hands and arms were the most painful, constantly aching. When his sons arrived to visit him, they found that their father was unrecognizable. The experience was traumatizing for his youngest son, Matthaeus, who couldn't bear to return to the hospital and see his father in this condition.



40. The next day, in addition to wound care, doctors started physical therapy to treat Bernie's muscle weakness, impaired mobility, limited range of motion, and inability to perform simple daily tasks. The critical care surgeon specializing in burn treatment determined that Bernie would require several surgeries due to the severity of his burns.

41. On October 9, 2019, Bernie underwent the first of three surgeries—a surgical preparation of wound bed and epidermal autograft of the right hand, leg, flank/back, and upper arm. The wounds on his right flank and back, which extended to his posterior upper right arm, were deep, and doctors used multiple blades to cut away the damaged tissue. Finally, the surgeon placed meshed cadaver skin over the wound, which he anchored with staples.

42. On October 11, 2019, Bernie underwent his second surgery for excision and preparation for grafting. More specifically, the procedures performed included:

1. Tangential excision and preparation of wound bed for grating to the left hand total area of 152 cm2;
2. Tangential excision and preparation of wound bed for grating to the left arm, left lower leg, and left thigh total area 2054 cm2;
3. Split thickness skin graft to the excised areas located on the left thigh and left leg total area 1290 cm2- Wound Class: Class IV (Dirty or Infected);
4. Regenerative epidermal autologous spray skin graft to left hand for total area of 152 cm2; and
5. Regenerative epidermal autologous spray skin graft to left leg, left thigh, left donor and left arm for a total area of 2429 cm2- Wound Class: Class IV (Dirty or Infected).

43. A tangential excision involves removal of the necrotic (dead tissue) surface of a burn, taking repeated slices parallel to the skin surface using a surgical blade. The burn was deep into the dermis in most areas and penetrated the layer of fat beneath the dermis in some areas on his leg.

44. In order to allow him time to heal, UCI Burn Unit surgeons decided to abstain from any operative debridement or grafting for one week. On October 23, 2019, Dr. Victor C. Joe performed a third procedure on Bernie, which included surgical preparation for wound beds, split thickness skin graft, and epidermal autograft to the right arm, flank/back and leg.

45. On November 11, 2019, 36 days after the explosion, Bernie was discharged from the hospital. He was instructed to continue with wound care and dressing changes at home, with the assistance of his close friends, girlfriend, and family. Bernie needed help applying cream all over his body and changing his dressings multiple times a day. The process was especially difficult because any time someone touched him, it was painful. His pain worsened in the evening, increasing his sensitivity and making it difficult to sleep at night. As part of his scar management, Bernie was fitted with pressure gradient garments that he wears on a daily basis.

46. As days, weeks, and now months have passed since the explosion, Bernie remains in pain and has continued treating with his physicians at UCI. The burns left him with debilitating nerve pain that was so severe he wanted to "crawl out of his own skin." In addition, to the physical pain, Bernie is permanently disfigured with scars covering nearly half of his body including his legs, arms, torso, and neck. These scars, despite ongoing therapy, limit his range of motion, such as his ability to raise his arm, and interfere with his ability to complete common everyday tasks. Current photographs of the scarring on his right leg and right arm are included to the left.

47. Bernie's physical injuries are extensive, but he also suffered equally devastating emotional trauma. Bernie's family has noticed changes in his personality, behavior, temperament and memory since the explosion. Previously patient and happy,

he is now easily frustrated, irritable, and impatient—he is not the same person he was before the explosion.

48. Furthermore, brain imaging revealing significant brain abnormalities has confirmed that Bernie sustained a traumatic brain injury in this explosion. A recent MRI demonstrated a loss of brain substance and multiple areas of scarring in the frontal lobe—the area of the brain that controls executive functions, such as concentration and memory. Bernie also suffered damage to his brain consistent with personality change. All of this brain damage makes Bernie more susceptible to early onset dementia. Sadly, we are inundated on a daily basis with the horrors associated with this unrelenting disease. Bernie is now sixty years old, and this is a frightening new reality for him, a single parent to two young men.

E. Defendants' responsibility for the terrifying transformer explosion

1. SCE is subject to the Public Utilities Code and CPUC General Orders

49. SCE is regulated by the California Public Utilities Commission, who enforces the Public Utilities Code, rules and regulations, and has the authority to issue fines and penalties for violations of state rules and regulations. Within the CPUC, the Safety and Enforcement Division works diligently to ensure that regulated services are delivered in a safe and reliable manner.[2] Pursuant to California Public Utilities Code § 451, SCE is required to furnish and maintain its electrical systems in a manner that promotes the safety, health, comfort and convenience of its patrons and the public. (Pub. Util. Code § 451). In addition, Pursuant to California Public Utilities Code § 702, SCE must "obey and comply with every order, decision, direction, or rule made or prescribed by the [California Public Utilities] commission."

50. CPUC General Order 128, Rule 12.2 governing maintenance of underground structures and equipment states that electrical systems "shall be

[2] The CPUC is currently investigating the Bischof incident and SCE's conduct leading up to the explosion.

maintained in such condition as to secure safety to workmen and the public in general." Rule 17.2 of this general order regarding inspection of underground systems requires SCE inspect its electrical equipment "**frequently and thoroughly for the purpose of insuring that they are in good condition** and in conformance with all applicable requirements of these rules." (GO 128, Rule 17.2 [emphasis added]). Further, General Order 165 requires SCE to conduct "patrol" inspections of underground transformers every year and detailed inspections every 3 years. The rule defines "detailed" "as one where individual pieces of equipment and structures are carefully examined, visually and through the use of routine diagnostic tests, as appropriate, and (if practical and if useful information can so be gathered) opened, and the condition of each rated and recorded." (GO 165, III.A.(4).)

2. SCE's failure to comply with mandatory maintenance, inspection, and safety standards

a. SCE's failure to follow manufacturer guidelines

51. SCE routinely fails to follow manufacturer recommendations in the maintenance and inspection of its distribution system, including transformers. The CPUC has noted during the course of other SCE investigations that while utilities oftentimes "incorporate manufacturer testing specifications into their testing protocol," SCE apparently does not. (*See* SED Staff Report attached as Exhibit 4, p. 25). In this case, SCE admits that it did not keep a copy of or have access to the GE manufacturer manual for the transformers contained within the Old World transformer bank—manuals that set forth recommended inspection and maintenance protocols.

b. SCE's violations of the Public Utilities Code and General Orders

52. Understanding the significant potential dangers posed by the distribution of electricity to the public, SCE had a duty to properly construct, repair, inspect, maintain, and operate its electrical equipment, including the Old World transformer

bank. In addition, SCE is required to properly train its linemen and technicians on how to perform vital maintenance and inspections of high voltage, highly combustible equipment. In maintaining, inspecting, and repairing these high voltage electrical components, SCE must comply with Public Utilities Code § 451, CPUC General Orders, and manufacturer recommendations. Here, SCE failed to comply with multiple standards by violating each of the following rules:

1. Failing to maintain its electrical systems, including the Old World Huntington Beach transformer vault, in a manner that promotes the safety and health of the public, in violation of California Public Utilities Code § 451;
2. Failing to maintain its transformer "in such a condition as to secure safety to workmen and the public in general," as required by CPUC General Order 128, Rule 12.2;
3. Failing to ensure the transformer was "designed, constructed, and maintained for [its] intended use, regard being given to the conditions under which [it is] to be operated, to enable the furnishing of safe, proper and adequate service," as required by CPUC General Order 128, Rule 17.1;
4. Failing to inspect the transformers "frequently and thoroughly for the purpose of insuring that they are in good condition and in conformance with all applicable requirements of these rules," as required by CPUC General Order 128, Rule 17.2;
5. Failing to take into consideration the safety of the general public in determining the appropriate location for the transformer, as required by CPUC General Order 128, Rule 17.3;
6. Failing to conduct inspections of the underground vault and its transformers "as necessary, to ensure reliable, high-quality, and safe operation," as required by CPUC General Order 165;
7. Failing to conduct proper Detailed Inspections of its underground transformer every three years, as required by CPUC General Order 165;

8. Failing to comply with rules and orders set forth by CPUC, in violation of Cal. Pub. Util. Code § 702; and
9. Failing to utilize or reference the applicable manufacturer maintenance manual with regard to inspecting and maintaining the Old World transformers.

3. SCE's repeatedly fails to take action and protect the public from an imminent catastrophic equipment failure

53. Exacerbating the situation, SCE's infrastructure is dated, which creates heightened risks for the public and presents an increased risk of catastrophic equipment failure. In its 2015 General Rate Case application papers, SCE admitted that its infrastructure is aging, and that equipment failure probabilities increase as equipment ages. Still, SCE failed to take any steps here to prevent a catastrophic and dangerous failure of its aged underground equipment. In addition, within its GRC Workpapers, SCE acknowledges the public safety risks associated with "violent failures of oil-filled equipment," like transformers. More specifically, that "[v]iolent failures of oil-filled equipment can release enough energy to send the concrete lid of the structure several feet into the air. Needless to say, this has the potential of causing great bodily harm and damaging property."[3] SCE also emphasizes the importance of replacing equipment before a catastrophic event occurs. "When in-service failure poses an unacceptable risk in terms of cost, reliability, and/or safety, **SCE and its customers cannot wait for equipment to fail; SCE must replace it preemptively**." (*Id.* [emphasis added].)

54. But despite its statements to CPUC, and despite a *history* of problems with these particular transformers, SCE did not preemptively replace the transformers contained within the Old World transformer bank. Instead, oblivious to the numerous

[3] 2015 General Rate Case Application Workpapers, SCE-03, Vol. 4, http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/2AC7C392902B318488257C210080F2DC/$FILE/SCE-03%20Vol.%2004.pdf

warning signs that the equipment was defective and needed to be replaced—exploding, smoking, rattling, and buzzing over the course of a ten-year period—SCE assured its customers that the transformer bank was "fine." In contrast to its claims to CPUC, here SCE chose the wait-and-see approach, which resulted in equipment failure that caused catastrophic injuries to Bernie.

55. Not only did SCE fail to replace the defective and dangerous equipment, it failed to even properly inspect and maintain its aging electrical components (in spite of its obligation to do so per General Orders 165 and 128), components that had suffered a prior catastrophic failure. In the years leading up to the October 5, 2019 explosion, SCE failed to inspect, maintain, repair, and replace the transformer bank and its component parts, including failing to check the mineral oil level within the transformers, which had dropped below acceptable levels. The mineral oil within a liquid-filled transformer is used for both electrical insulation and cooling. Maintaining adequate oil levels is *essential* to proper functioning of the transformer. Prior to the explosion, the oil within the transformer that ultimately exploded had dropped below electrical components within the transformer, including the brake switch, causing it to overheat.

56. Checking the oil level of this transformer is simple, and should have been completed as part of SCE's required inspections. To confirm that the oil remains at acceptable levels, SCE need only look into the sight glass on the top of the transformer. If any red is visible within the sight glass, that is an indication that the oil level has dropped below the sight glass, presenting a safety issue, because in that instance the oil is no longer cooling certain components within the transformer. Each time SCE crews responded to a complaint about this transformer—exploding, smoking, making rattling sounds, and buzzing—the oil level should have been checked. Had SCE conducted the detailed inspections required under General Order 165, SCE easily would have discovered that the transformer oil was low and required maintenance, well before it failed. SCE's maintenance failures also include a blatant disregard of manufacturer recommendations. SCE did not maintain a copy of or have access to the GE manual for

the subject transformers. SCE also used poorly trained technicians, lacking the benefit of the manufacturer's maintenance manual, who performed shoddy inspections, leaving an easily remedied problem to fester.

57. Rather than spend money to maintain its infrastructure and replace old, failing high voltage equipment, SCE focuses its funding on boosting profits and compensation. SCE's long-standing history and corporate culture of placing profits over basic maintenance and public safety left Old World, and the many members of the public who worked or visited there, vulnerable to the aftermath of a catastrophic failure. SCE had other options to ensure public safety, but those options would have negatively impacted SCE's bottom line, so it refused to take action. Specifically, SCE failed to take advantage of several opportunities to protect the public, including: (1) refusing to relocate the transformer away from an area frequently traversed by the public; (2) choosing not to replace the transformer with a new underground oil-filled transformer; or (3) deciding not to take advantage of newer transformer models on the market that increase safety, such as transformers containing non-flammable FR3 oil. All of these options were available to SCE, and any one of them would have saved Bernie years of pain, distress, and trauma.

58. With respect to location, General Order 128, Rule 17.3 states that SCE's facilities "shall be located with consideration for safety of property, the general public and persons engaged in the construction, operation, and maintenance thereof." Here, SCE's underground vault—housing potentially explosive transformers—was located directly below an outdoor patio where restaurant guests frequently dine, walk, and congregate. Since at least 2010, SCE was aware of issues with the transformer bank and that Bernie was concerned about its safety. He and his family repeatedly asked SCE to relocate the dangerous underground device. Despite this knowledge and its responsibility to consider the safety of property and the general public in the location of its facilities, SCE opted instead to disregard public safety and leave the aging transformers in place.

59. Since 1994, advances in technology have improved transformer safety, including decreasing the risk of explosion or fire. One of those advances is the development of oils, such as FR3 oil, that are less flammable than mineral oil. FR3 oil is derived from renewable vegetable oil, offering both safety and environmental benefits. FR3 transformers are widely used, with more than 1 million distribution and power transformers worldwide. In fact, SCE has taken advantage of this technology in some of its new transformers and is well aware of the associated safety benefits. The fire point for FR3 oil is more than twice that of mineral oil and oil manufacturers advertise that this greatly improves fire safety for any transformer, particularly in heavily populated areas such as restaurants, malls, and urban communities. Since its introduction, there has been no reported fire-related failure with transformers filled with FR3 fluid.[4] Further, suppliers of FR3 oil like Cargill also market it as a solution for older transformers to become compliant with current fire code regulations—instead of replacing or moving the transformers, they can simply be retrofilled with FR3 oil.

60. The safety risks associated with high voltage equipment such as SCE's underground transformers are well known to utility companies like SCE, and this explosion and its catastrophic consequences were foreseeable and highly preventable. In a March 2010 advice letter regarding its initiative to install above-ground distribution systems whenever feasible, SCE acknowledged the serious safety hazards associated with underground transformers, warning that: "When a catastrophic failure occurs, pressure inside an underground structure can build up and can be released through a rapid discharge of high energy. This release of energy could result in the rapid exhaust of hot gasses or flames." As an example, SCE referenced a 2004 underground transformer failure in which flames shot out of the transformer, acknowledging that "had there been any employees in that substructure when the failure occurred, serious injuries may have resulted." (The 2010 Advice Letter is attached as Exhibit 2.) In

[4] Cargill website: https://www.cargill.com/bioindustrial/fr3-fluid/fr3-fluid-better-than-mineral-oil; https://www.cargill.com/doc/1432076501275/envirotemp-fr3-brochure.pdf

addition to its negligence, SCE gambled with public safety, a gamble for which Bernie paid dearly, and for which SCE must now be accountable for.

F. SCE's conscious disregard of public safety—placing profits over public safety—and other reprehensible conduct is sufficient to impose punitive damages

61. The purpose of punitive damages is to punish the defendants, to make an example, and to thereby deter others from similar conduct. (*Neal v. Farmers Ins. Exchange* (1978) 21 Cal.3d 910, 928.) Punitive damages are appropriate here because SCE's conduct toward the public, Bernie, and others at Old World, exhibits "malice," "oppression," or "fraud." (Cal. Civil Code § 3294.) The law is written in the disjunctive and only requires one of the three components set forth in Civil Code § 3294—malice, oppression, *or* fraud—to impose punitive damages.

62. Malice is defined as either "conduct which is intended by the defendant to cause injury to the plaintiff," or "despicable conduct which is carried on by the defendant with a willful and conscious disregard of the rights or safety of others." (Civ. Code § 3294(c)(1).) Under the statute, "malice does not require actual intent to harm. Conscious disregard for the safety of another may be sufficient where the defendant is aware of the probable dangerous consequences of his or her conduct and he or she willfully fails to avoid such consequences. Malice may be proved either expressly through direct evidence or by implication through indirect evidence from which the jury draws inferences." (*Angie M. v. Superior Court* (1995) 37 Cal.App.4th 1217, 1228 (internal citations omitted).) Oppression is "despicable conduct that subjects a person to cruel and unjust hardship in conscious disregard of that person's rights." (Cal. Civ. Code § 3294(c)(2).) And "fraud" is defined as "an intentional misrepresentation, deceit, or concealment of a material fact known to the defendant with the intention on the part of the defendant of thereby depriving a person of property or legal rights or otherwise causing injury." (*Id.* at § 3294(c)(3).)

63. For example, "a conscious disregard of the safety of others may constitute malice within the meaning of section 3294. In order to justify an award of punitive damages on this basis, the plaintiff must establish that the defendant was aware of the probable dangerous consequences of his conduct, and that he willfully and deliberately failed to avoid those consequences." (*American Airlines, Inc. v. Sheppard, Mullin, Richter & Hampton*, 96 Cal.App.4th 1017, 1051.) In addition, "[n]onintentional conduct comes within the definition of malicious acts punishable by the assessment of punitive damages when a party intentionally performs an act from which he knows, or should know, it is highly probable that harm will result." (*Ford Motor Co. v. Home Ins. Co.* (1981) 116 Cal.App.3d 374, 381.) It suffices that the defendant knew his or her conduct probably would have injurious consequences to someone. (*Ramona Manor Conv. Hosp. v. Care Enter.* (1986) 177 Cal.App.3d 1120, 1133.)

64. Here, SCE *knew* that the 25-year-old transformer bank installed at Old World was dangerous, with numerous safety issues spanning a ten-year period. Yet, it failed to perform basic maintenance, conduct sufficient inspections of the vault and equipment, properly train its employees regarding transformer inspection and maintenance, or replace the transformers located directly beneath a bustling restaurant, where children and families regularly dine. Compounding its refusal to protect the public, SCE then spent *years* lying to Bernie and his family, falsely reassuring them that the transformer bank was "okay" and safe. As a result of SCE's lies and years of neglect, the inevitable happened: the transformer exploded in the middle of Old World's Oktoberfest celebration, spewing flames and hot oil throughout the restaurant's patio, nearly killing Bernie. It was only because of the actions that Bernie took to protect his patrons that more members of the public were not severely burned, or killed, by the explosion.

65. In this case, the probable consequences of SCE's failures described above were known to SCE well before the explosion that harmed Bernie. This transformer bank had exploded once before in 2010, continued to demonstrate indications of a

dangerous failure for years, and in 2018 SCE's own lineman referred to this vault as "a death trap." Sadly, SCE disregarded those probable dangerous consequences and, in an effort to save money, decided not to replace or relocate the transformers. An award of punitive damages is justified based on SCE's pattern and practice of consciously disregarding the safety of the public and its customer, Bernie, failing to properly inspect and maintain its electrical equipment despite the danger, lying to its customers and falsely cloaking its dangerous equipment with the appearance of safety, and placing profits over public safety.

66. Unfortunately, SCE's conduct here, though particularly egregious, was not isolated. SCE has a pattern and practice of failing to properly inspect and maintain its equipment. Various audits of SCE's distribution facilities performed by CPUC throughout the state reveal that SCE consistently fails to perform required or adequate maintenance of its distribution facilities. In 2015, SCE failed to adequately inspect an overhead transformer, resulting in an explosion. But in addition to that, SCE had actual notice that the transformer, which had been installed in 1960, was operating well over its capacity and that a catastrophic failure was inevitable. (CPUC Notice of Violation Letter, attached as Exhibit 3.) But instead of promptly replacing it or appropriately categorizing the priority level of addressing the safety hazard presented by the transformer, SCE left the transformer in place, where it would explode 10 days later. Yet another example, following the 2015 Long Beach outages, CPUC criticized SCE's lack of any testing performed on its network transformers, which are a critical part of SCE's system. Except at the time of installation, SCE only performed visual inspections, which is not recommended by the manufacturer or accepted good practice with respect to oil-filled transformers. In the Long Beach case, CPUC noted that while utilities oftentimes "incorporate manufacturer testing specifications into their testing protocol," SCE apparently does not. (SED Staff Report, attached as Exhibit 4, at p. 25.) The transformers there were also manufactured by GE, and despite GE's recommendation that transformer insulating oil be sampled and tested regularly, SCE failed to do that. In

addition, SCE was unable to produce the maintenance manual or data sheets for the network transformers at issue.

67. Over the years, SCE has demonstrated a lack of any regard for the rules it is subject to, its responsibilities under California law, and the safety of its customers and the public. SCE's conduct described herein was undertaken by its corporate officers or managing agents, who were responsible for SCE's maintenance, safety, compliance, inspection, and other programs and divisions. As those officers and managing agents are currently unknown to Plaintiff, they are identified throughout this complaint as DOES 41 through 50, inclusive. The conduct of SCE alleged throughout this Complaint, which was carried on by or through SCE's officers and managing agents, was undertaken on behalf of and in furtherance of SCE's aims—profits and its own financial condition over public safety. SCE had advanced knowledge of the actions and conduct of said individuals (including those who made false representations to the Bischofs, and those who intentionally ignored maintenance, inspection, testing, and other requirements and pleas to improve safety) whose actions and conduct were ratified, authorized, and approved by managing agents of SCE whose precise identities are unknown to Plaintiff at this time and are therefore identified and designated in part as certain DOES.

68. SCE's lack of regard for public safety is demonstrated by even a cursory review of its violation history with the CPUC. CPUC audits of SCE facilities spanning the last ten years have revealed numerous violations of CPUC General Orders, including at least 21 violations of GO 128 rules regarding Maintenance and at least 45 violations of GO 165's Inspection and Record-keeping requirements. Further, in 2011 CPUC audited various facilities within the Huntington Beach District, including inspecting areas where SCE had recently performed "detailed inspections" of overhead and underground equipment. The CPUC engineer tasked with performing the audit determined that during SCE's detailed inspections, it had failed to document all General Order violations, as required by General Order 165. The CPUC auditor also

noted violations pertaining to SCE's transformers, including two above ground structures that lacked adequate ventilation to prevent internal temperatures in excess of those at which the transformer can safely operate.

69. SCE's failures are widespread, leading to over $86.5 million in fines since 2009 for electric and fire related incidents. (The CPUC summary of Electric Penalties Assessed by SED in the Last 10 Years is attached as Exhibit 5.) These fines include a $2 million penalty imposed for a deadly 2013 Huntington Beach underground vault explosion. SCE has failed to implement appropriate risk assessment practices to curtail its many safety issues. When the CPUC Safety and Enforcement Division evaluated SCE's 2018-2020 General Rate Case application, it was critical of SCE's company-wide risk assessment practices, determining that ***"SCE is classifying major categories of spending as safety related even though they related to issues of customer satisfaction or electronic service reliability than safety."***[5]

70. The reprehensibility of SCE's placing profit over public safety—especially when they have a long history of doing so—is high and justifies a large award of punitive damages.

FIRST CAUSE OF ACTION

(Negligence)

PLAINTIFFS BERN BISCHOF, MARKUS BISCHOF, JOSEF BISCHOF, CYNDIE KASKO, AND JASON KASKO FOR A FIRST CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 1-50, INCLUSIVE, FOR NEGLIGENCE, ALLEGE:

71. Plaintiffs refer to each and every one of the above paragraphs and incorporate those paragraphs as though set forth in full in this cause of action.

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[5] Risk and Safety Aspects of Southern California Edison's 2018-2020 General Rate Case Application, https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Safety/Risk_Assessment/SCE%202018%20GRC%20Report%20Final%20with%20Appendix%20A.pdf

72. Defendants SCE and DOES 1-50, inclusive, owed Plaintiffs a duty of care to maintain, inspect, install, replace, control, repair, locate, and operate the Old World underground electrical transformer vault and all equipment contained within the vault in a reasonable and safe manner. Defendants SCE and DOES 1-50, inclusive, owed a duty to Plaintiffs to utilize a level of care commensurate with the proportionate danger of designing, engineering, constructing, installing, operating, and maintaining high voltage electric transmission and distribution systems, including underground transformer vaults and transformers.

73. Defendants SCE and DOES 1-50, inclusive, breached their respective duties by failing to exercise reasonable care in the maintenance, inspection, installation, replacement, control, repair, location, use, and operation of the Old World underground electrical vault, including the transformers and all equipment and component parts contained within the vault. Defendants SCE and DOES 1-50, inclusive, breached the duty of care by, among other things, negligently and/or recklessly:

a. Failing to comply with the applicable statutory, regulatory, and/or professional standards of care;

b. Failing to timely and properly maintain, manage, inspect and/or monitor the Old World underground vault and electrical equipment;

c. Failing to design, construct, monitor, maintain, and inspect high voltage electrical equipment in a manner that avoids the potential for explosion and fire;

d. Failing to properly train and to supervise employees and agents responsible for the maintenance of the underground transformer vault to perform basic maintenance recommended by the manufacturer, in addition to maintenance mandated by CPUC;

e. Failing to ensure proper workmanship by their employees and agents in maintenance and inspection of the underground transformer vault and electrical equipment;

f. Failing to follow manufacturer recommendations with respect to the maintenance and repair of the Old World underground electrical transformer vault, including the transformer bank;

g. Failing to comply with California Public Utilities Code § 451;

h. Failing to comply with California Public Utilities Code § 702;

i. Failing to maintain, inspect and repair the transformer bank as required by CPUC General Order Nos. 128 and 165;

j. Failing to implement sufficient inspection and maintenance practices to ensure its distribution facilities were in good working order;

k. Failing to properly identify and prioritize safety hazards;

l. Failing to perform sufficient testing on its electrical equipment;

m. Failing to repair or replace damaged or deteriorated equipment; and

n. Failing to ensure that its structures and equipment were in good working order and functioning in a safe manner.

74. Defendants SCE and DOES 1-50, inclusive, failed to properly maintain, repair, replace, operate, use, locate, install and inspect the Old World underground vault, including the transformers and component parts contained within the vault. This transformer bank suffered from defects which rendered it dangerous and unsafe for operation. Defendants SCE and DOES 1-50's, inclusive, failure to exercise due care in the repair, replacement, inspection, use, and operation of the underground vault, including the transformers contained within the vault, was a direct, legal, and proximate cause of the injuries and damages suffered by Plaintiff as herein alleged.

75. Plaintiffs are informed and believe and thereon allege that Defendants SCE and DOES 1-50, inclusive, were negligent in other acts or omissions of which the Plaintiffs are presently unaware.

76. SCE and DOES 1-50's violation of the California Public Utilities Code §§ 451 and 702, CPUC General Order Nos. 128 and 165, and other statutes, rules, and regulations, were a substantial factor in causing Plaintiffs' harm. The violation of these

statutes, regulations, and ordinances was not excused. Further, Plaintiffs were of the class of persons that statute was intended to protect and his injury resulted from the kind of occurrence the statute was designed to prevent. As such, there is a presumption of negligence per se.

77. As a proximate result of the negligence of Defendants SCE and DOES 1-50, inclusive, Plaintiff Bern Bischof has suffered injuries, as previously alleged, and will continue to suffer, general and special damages to be determined at trial. The negligence and recklessness of Defendants SCE and DOES 1-50, inclusive, was a substantial factor in causing the explosion, fire, and serious injuries to Bernie, including, painful burns to nearly half of his body, disfigurement, emotional distress, anxiety, cognitive changes, and a traumatic brain injury that leaves him more susceptible to dementia.

78. The Defendants knew of the severe risks associated with the Old World transformer bank and that it could catastrophically explode in the dining area of Old World Restaurant causing widespread harm to members of the public nearby. The transformer bank had exploded years earlier and thereafter continued to have issues including rattling, buzzing, smoking, and making "dangerous sounds," all of which were reported to SCE, placing them on notice that the transformer bank was failing, and in desperate need of inspection, maintenance, repair and replacement.

79. Plaintiff Bern Bischof incorporates by reference the damage allegations of paragraphs 36-48 alleged against Defendants SCE and DOES 1-50, inclusive, as though fully set forth herein. Further, as a proximate result of Defendants' conduct, Bernie sustained severe personal injuries and damages, including:

1) Bernie has suffered, continues to suffer, and will in the future suffer great mental, physical and emotional pain, in sums according to proof at the time of trial;
2) Bernie was required to, and did, and will in the future, employ physicians and surgeons to examine, treat and care for him, and

did and will in the future incur medical and incidental expenses for such care and services, in a sum according to proof at the time of trial; and

3) Bernie has incurred past and future loss of earnings and diminished earning capacity, in an amount according to proof at the time of trial.

80. As a proximate result of the negligence of Defendants SCE and DOES 1-50, inclusive, Plaintiff Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko have suffered and will continue to suffer serious emotional distress, and will seek general and special damages to be determined at trial. The negligence and recklessness of Defendants SCE and DOES 1-50, inclusive, was a substantial factor in causing the explosion, fire, and serious injuries to their family member Bernie, causing said to experience suffering, anguish, fright, horror, nervousness, grief, anxiety, worry, shock, humiliation, and/or shame.

81. Defendants SCE and DOES 41-50's, inclusive, conduct described herein was despicable conduct carried out with a willful and conscious disregard of the risk of safety to Bernie, his family, and other members of the public. Defendants SCE and DOES 41-50, inclusive, failed to properly inspect, install repair, replace, locate, and maintain the Old World underground transformer vault, despite knowledge that the underground vault contained aging equipment, equipment that had previously exploded in 2010. Defendants SCE and DOES 41-50, inclusive, knew of the risk that the high voltage underground transformer would explode, and that any explosion would have very serious safety consequences, yet knowingly failed to take steps to protect the public. Defendants SCE and DOES 41-50, inclusive, placed profit over safety and knowingly decided to cut corners to protect SCE's bottom line—failing to properly maintain, repair, or replace the dangerous transformers.

82. Said conduct by Defendants SCE and DOES 41-50, inclusive, subjected Bernie to cruel and unjust hardship in conscious disregard of his rights and/or was an

intentional misrepresentation, deceit or concealment of material facts known to SCE and DOES 41-50, inclusive, with the intention to deprive Bernie of property, legal rights or to otherwise cause injury. Said conduct thus constitutes malice, oppression or fraud under California Civil Code section 3294, thereby entitling Bernie to punitive damages against SCE and DOES 41-50, inclusive, in an amount appropriate to punish or set an example of SCE and DOES 41-50.

83. SCE and DOES 41-50's, inclusive, conduct described herein was undertaken by its officers or managing agents, who were responsible for the installation, inspection, repair, and maintenance of the subject underground transformer vault. The aforementioned conduct of said managing agents and individuals was therefore undertaken on behalf of SCE and DOES 41-50, inclusive. SCE and said DOES 41-50, inclusive, further had advance knowledge of the actions and conduct of these individuals whose actions and conduct were ratified, authorized, and approved by managing agents.

84. Plaintiffs reserve the right to seek leave of court to amend this Complaint to allege punitive damages against Defendants and DOES 1-40, in the event specific facts that may be learned during discovery justify such amendment.

SECOND CAUSE OF ACTION

(Strict Products Liability)

PLAINTIFFS BERN BISCHOF, MARKUS BISCHOF, JOSEF BISCHOF, CYNDIE KASKO, AND JASON KASKO FOR A SECOND CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 51-90, INCLUSIVE, FOR STRICT PRODUCTS LIABILITY, ALLEGE:

85. Plaintiffs refer to each and every preceding paragraph and incorporate those paragraphs as though set forth in full in this cause of action.

86. At all times mentioned herein, Defendants SCE and DOES 51-90, inclusive, were engaged in the business of, and prior to October 5, 2019, did

manufacture, fabricate, design, assemble, distribute, sell, inspect, wholesale, and advertise the transformers contained within the Old World underground vault including their component parts, hereinafter "the transformer bank."

87. On October 5, 2019, the transformer bank was being used in a reasonably foreseeable and intended manner, when suddenly the transformer bank exploded, shooting massive flames into the air and causing severe and painful injuries to Bernie, who was standing nearby, as well as physical harm to Jason Kasko and/or Markus Bischof, and serious emotional distress to Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko.

88. Based on information and belief, SCE was involved in and directed the design of the transformers contained within the transformer bank, including providing specifications for the transformers and its various component parts.

89. Defendants SCE and DOES 51-90, inclusive, knew that that the transformer bank would be used within an underground vault to convert high voltage electricity to lower voltage for use in nearby restaurants and homes. Defendants SCE and DOES 51-90, inclusive, also knew that the underground vault containing the transformer bank was located on a restaurant patio where members of the public frequently dine, stand, and congregate.

90. Defendants and DOES 51-90, inclusive, manufactured, designed, assembled, packaged, tested, fabricated, inspected, marketed, distributed, and sold the transformer bank with defects in both design and manufacturing which made the transformer bank dangerous, hazardous, and unsafe for its intended and reasonably foreseeable use. At the time the transformer bank left the possession and control of Defendants and DOES 51-90 it had defects in design and manufacturing such that it had the dangerous capacity for sudden, unexpected explosions and fires during its intended and reasonably foreseeable use.

91. The design and manufacturing defects in the transformer bank included: defective and unsafe design of the transformers and component parts including, but not

limited to the transformer switch, contacts and/or associated adjustment, connections, coils, windings, wiring, conductor, exterior casing, mineral oil, fuses, venting mechanisms, and elbows, which ultimately caused the transformer bank to suddenly and catastrophically explode.

92. The transformer bank contained a design and/or manufacturing defect when it was introduced into the stream of commerce by Defendants SCE and DOES 51-90, inclusive.

93. The transformer bank was defective and unsafe for its intended use. Due to the design and/or manufacturing defects, the transformer bank failed to perform as safely as an ordinary consumer would expect when used in an intended or reasonably foreseeable manner.

94. Furthermore, the risk of danger in the design of the transformer bank outweighed any benefits of the design and safer alternative designs were available at the time of manufacture. Therefore, the transformer bank presented a substantial and unreasonable risk of serious injuries to those in the vicinity of the transformer bank.

95. The defects in the design and manufacture of the transformer bank were a substantial factor in causing Bernie's severe injuries and damages as herein alleged.

96. Defendants and DOES 51-90, inclusive, had actual or constructive knowledge of the risks inherent in the transformer bank at the time of its sale, installation, distribution, and manufacture, and that they could cause fire, explosion, and widespread devastation.

97. The inherent risks and dangers in using the transformer bank in an intended or reasonably foreseeable way presented a substantial danger to members of the public in the vicinity of the transformer bank, including innocent bystanders like Bernie.

98. An ordinary consumer would not have recognized the potential risks and dangers inherent in the transformer bank.

99. In addition, on October 5, 2019, there were defects in the electrical current, voltage, and electricity hereinafter "electricity," including, but not limited to the delivery of electricity at dangerously high voltage due to a defective transformer, resulting in explosion and fire.

100. At all times mentioned herein, Defendants SCE and DOES 51-90, inclusive, were engaged in the business of, and prior to October 5, 2019, did manufacture, distribute, supply, sell, and advertise the electricity flowing into the transformer bank and the Old World German restaurant.

101. On October 5, 2019, the electricity was being used in a reasonably foreseeable and intended manner, when suddenly the transformer bank exploded, delivering dangerously high voltage, resulting in an explosion that ultimately injured Bernie.

102. Defendants SCE and DOES 51-90, inclusive, manufactured, distributed, supplied, advertised, and sold the electricity with defects in both design and manufacturing which made the electricity dangerous, hazardous, and unsafe for its intended and reasonably foreseeable use. At the time the electricity left the possession and control of Defendants SCE and DOES 51-90 it had defects in design and manufacturing. The electricity contained a design and/or manufacturing defect when it was introduced into the stream of commerce by Defendants SCE and DOES 51-90, inclusive.

103. The electricity was defective and unsafe for its intended use. Due to the design and/or manufacturing defects, the electricity failed to perform as safely as an ordinary consumer would expect when used in an intended or reasonably foreseeable manner.

104. The defects in the design and manufacture of the electricity were a substantial factor in causing Bernie's severe injuries and damages as herein alleged.

105. Defendants SCE and DOES 51-90, inclusive, had actual or constructive knowledge of the risks inherent in the electricity at the time of its sale, distribution, and

manufacture, and that it could cause high voltage surges, fire, explosion, and widespread devastation. These risks inherent in the electricity presented a substantial danger to consumers and members of the public—risks an ordinary consumer would not have recognized or appreciated.

106. Defendants SCE and DOES 51-90, inclusive, also failed to warn of the dangers in the reasonably foreseeable use of the transformer bank and the electricity, and failed to provide proper and appropriate instructions for their safe use, maintenance, inspection, and testing.

107. Defendant SCE's and DOES 51-90s', inclusive, failure to warn of the risks was a substantial factor in causing Bernie's severe injuries and damages as herein alleged.

108. As a result of the defective transformer bank, electricity, and Defendant SCE's and DOES 51-90s', inclusive, failure to warn, Bernie sustained severe personal injuries and damages, previously alleged in paragraphs 36-48, and incorporated herein by this reference.

109. Defendant SCE's and DOES 51-90s', inclusive, failure to warn of the risks was a substantial factor in causing injuries and damages to Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko as herein alleged.

110. Defendant SCE and DOES 81-90's, inclusive, conduct described herein was despicable conduct carried out with a willful and conscious disregard of the risk of safety to Bernie, his family, and other members of the public. Defendant SCE and DOES 81-100, inclusive, failed to implement a safer alternative, or conduct any testing or safety precautions on its high voltage electricity, electrical equipment, and transformer bank. Defendant SCE and DOES 81-90, inclusive, knew of the risk that the electricity, electrical equipment, and transformer bank would cause high voltage surges, fire, and explosion, and knowingly failed to take steps to design and manufacture a safer product or warn consumers of such known risks. Indeed, prior to the incident, SCE had received numerous complaints about the transformer bank, including reports of a prior

explosion in June 2010. In addition, Defendant SCE and DOES 81-90, were aware that other transformers manufactured, distributed, sold, and installed by Defendant SCE and DOES 81-90 had exploded, and that an explosion within an underground vault could pose serious danger to the public. Yet, Defendant SCE and DOES 81-90 knowingly failed to take steps to protect the public. Defendant SCE and DOES 81 through 90, inclusive, placed profit over safety and knowingly decided to cut corners to protect SCE's bottom line—failing to properly, manufacture, design, or provide warnings for the dangerous transformer bank.

111. Said conduct by Defendant SCE and DOES 81-90, inclusive, subjected Bernie to cruel and unjust hardship in conscious disregard of his rights and/or was an intentional misrepresentation, deceit or concealment of material facts known to SCE and DOES 81-90, inclusive, with the intention to deprive Bernie of property, legal rights or to otherwise cause injury. Said conduct thus constitutes malice, oppression or fraud under California Civil Code section 3294, thereby entitling Bernie to punitive damages against SCE and DOES 81-90, inclusive, in an amount appropriate to punish or set an example of SCE and DOES 81-90.

112. SCE and DOES 81-90's, inclusive, conduct described herein was undertaken by its officers or managing agents, who were responsible for the inspection, manufacture, design, and installation of the subject underground transformer vault and the electricity flowing into the vault. The aforementioned conduct of said managing agents and individuals was therefore undertaken on behalf of SCE and DOES 81-90, inclusive. SCE and said DOES 81-90, inclusive, further had advance knowledge of the actions and conduct of these individuals whose actions and conduct were ratified, authorized, and approved by managing agents.

113. Plaintiffs reserve the right to seek leave of court to amend this Complaint to allege punitive damages against Defendants and DOES 51-80, in the event specific facts that may be learned during discovery justify such amendment.

THIRD CAUSE OF ACTION

(Negligent Products Liability)

PLAINTIFFS BERN BISCHOF, MARKUS BISCHOF, JOSEF BISCHOF, CYNDIE KASKO, AND JASON KASKO FOR A THIRD CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 51-90, INCLUSIVE, FOR NEGLIGENT PRODUCTS LIABILITY, ALLEGE:

114. Plaintiffs refer to each and every preceding paragraph and incorporate those paragraphs as though set forth in full in this cause of action.

115. Defendants SCE and DOES 51-90, inclusive, negligently, recklessly and carelessly manufactured, fabricated, designed, assembled, distributed, sold, inspected, warranted, and advertised the transformer bank and the electricity flowing into the transformer bank and Old World German Restaurant such that they were dangerous and unsafe for their intended and/or reasonably foreseeable use.

116. Defendants SCE and DOES 51-90, inclusive, owed a duty to plaintiffs to exercise reasonable care in the design, manufacture, installation, distribution, and sale of the transformer bank and related electricity to ensure that they were safe for reasonably foreseeable use.

117. Defendants SCE and DOES 51-90, inclusive, failed to exercise the amount of care in the design, manufacture, distribution, installation, and sale of the transformer bank and electricity that a reasonably careful manufacturer, designer, seller, wholesaler, or distributor would have used in similar circumstances to avoid exposing others to a foreseeable risk of harm.

118. Defendants SCE and DOES 51-90, inclusive, knew or reasonably should have known that the transformer bank and electricity were dangerous when used in a reasonably foreseeable manner. Defendants SCE and DOES 51-90, knew or reasonably should have known that the transformer had a history of problems, including a prior explosion in 2010, followed by years of rattling, buzzing, and producing other dangerous sounds, and could explode in the course of expected and intended use, yet

refused to warn of these risks or take steps to reasonably correct, remedy, or otherwise take appropriate safety measures regarding these hazards. Furthermore, despite knowing these risks, Defendants SCE and DOES 51-90 failed to warn of the safety hazards inherent in these products, hazards that nearly cost Bernie his life.

119. Defendants SCE and DOES 51-90, inclusive, knew or reasonably should have known that people nearby would not realize the danger of fire in the reasonably foreseeable use of the transformer bank and electricity. A consumer does not expect a transformer bank to spontaneously and catastrophically explode, or electricity to suddenly surge at high voltages.

120. Defendants SCE and DOES 51-90, inclusive, failed to adequately warn of the dangers of fire, explosion, or instruct on the safe use of the products.

121. A reasonable manufacturer, designer, seller, wholesaler, or distributor in similar circumstances would have warned of the danger, or instructed on safe use of the products.

122. Defendants SCE's and DOES 51-90s', inclusive, failure to warn or instruct was a substantial factor is causing Bernie's harm.

123. As a proximate result of said negligent conduct, Plaintiffs suffered injuries as previously alleged. The negligence of Defendants SCE and DOES 51-90, inclusive, was a substantial factor in causing the explosions, serious injuries to Bernie, and injuries and/or serious emotional distress to Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko as previously alleged.

124. As a result of the defective transformer bank and electricity, and Defendants SCE's and DOES 51-90s', inclusive, conduct, Bernie sustained severe personal injuries that will last a lifetime. Those injuries are set forth in paragraphs 36-48, and incorporated herein by this reference.

FOURTH CAUSE OF ACTION

(Private Right of Action Pursuant to Public Utilities Code Section 2106)

PLAINTIFFS BERN BISCHOF, MARKUS BISCHOF, JOSEF BISCHOF, CYNDIE KASKO, AND JASON KASKO FOR A FOURTH CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 91-100, INCLUSIVE, FOR LIABILITY PURSUANT TO PUBLIC UTILITIES CODE SECTION 2106, ALLEGE:

125. Plaintiffs refer to each and every preceding paragraph and incorporate those paragraphs as though set forth in full in this cause of action.

126. Public Utilities Code Section 2106 creates a private right of action against "[a]ny public utility which does, causes to be done, or permits any act, matter, or thing prohibited or declared unlawful, or which omits to do any act, matter, or thing required to be done, either by the Constitution, any law of this State, or any order or decision of the commission[.]"

127. In addition, Public Utilities Code Section 2106 provides that a public utility held responsible under this section "shall be liable to the persons or corporations affected thereby for all loss, damages, or injury caused thereby or resulting therefrom."

128. As a public utility, SCE had a duty to properly design, construct, install, inspect, maintain and operate its electrical distribution system, including its underground transformers, in compliance with all applicable orders, decisions, regulations, and statutes, including, but not limited to, the following:

1) Public Utilities Code § 451;
2) Public Utilities Code § 702;
3) CPUC General Order 128, including rule 12.2, 17.1, 17.2, 17.3, and 34.2C; and
4) CPUC General Order 165, including sections III.A.(4), III.B, and III.C.

129. These regulations set forth the minimum standard of care SCE and DOES 91-100 are required to exercise in their distribution of electricity and maintenance of

their electrical equipment, and as such SCE's and DOE 91-100's violation of the legislative enactments and administrative regulations and orders is per se unreasonable and negligent.

130. Defendants SCE and DOES 91-100 inclusive, violated the above enumerated requirements by failing to: maintain their electrical systems, including the Old World Huntington Beach transformer bank, in a manner that promotes the safety and health of the public, in violation of California Public Utilities Code § 451; maintain their transformer "in such a condition as to secure safety to workmen and the public in general," as required by CPUC General Order 128, Rule 12.2; conduct inspections of the underground vault and transformers "as necessary, to ensure reliable, high-quality, and safe operation," as required by CPUC General Order 165; conduct proper Detailed Inspections of the underground transformer every three years, as required by CPUC General Order 165; and take into consideration the safety of the general public in determining the appropriate location for the transformer, as required by CPUC General Order 128, Rule 17.3.

131. Defendants SCE and DOES 91-100's violation of applicable orders, statutes, and regulations was a substantial factor in causing Bernie to suffer serious harm, including burns to 41% of his body and lasting physical and emotional trauma. As a result, Defendants SCE and DOES 91-100 are liable to Plaintiff for all losses, damages, and injuries caused by said violations of applicable orders, including but not limited to those stated within Public Utilities Code §§ 451 and 702, CPUC General Order 128, and CPUC General Order 165.

132. Defendants SCE and DOES 91-100's violation of applicable orders, statutes, and regulations was a substantial factor in causing Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko to suffer injuries and/or serious emotional distress. As a result, Defendants SCE and DOES 91-100 are liable to Plaintiffs for all losses, damages, and injuries caused by said violations of applicable orders, including

but not limited to those stated within Public Utilities Code §§ 451 and 702, CPUC General Order 128, and CPUC General Order 165.

133. Defendants SCE and DOES 91-100's acts and omissions were willful and wanton, and done with conscious disregard of public safety. Defendants SCE and DOES 91 through 100, inclusive, failed to properly inspect, install, repair, correct, replace, locate, and maintain the Old World underground transformer vault and electrical equipment within the vault, in violation of the above rules, orders, statutes and regulations, despite repeated requests from Bernie and his family to relocate the dangerous transformer bank before someone was injured, and knowledge that the underground vault contained aging equipment, equipment that had previously exploded in 2010. Defendants SCE and DOES 91-100, inclusive, knew of the risk that the high voltage underground transformer would explode, and that any explosion would have very serious safety consequences, yet knowingly failed to take steps to protect the public. Defendants SCE and DOES 91-100, inclusive, placed profit over safety and knowingly decided to cut corners to protect SCE's bottom line—failing to properly maintain, repair, replace or relocate the dangerous transformers.

134. As such, Defendants and DOES 91-100's acts and omissions were willful, intentional and malicious toward Bernie, and therefore in addition to actual damages, Plaintiffs seek to recover punitive and exemplary damages against Defendants SCE and DOES 91-100.

FIFTH CAUSE OF ACTION

(Negligent Infliction of Emotional Distress)

PLAINTIFFS MARKUS BISCHOF, JOSEF BISCHOF, CYNDIE KASKO, AND JASON KASKO FOR A FIFTH CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 1-50, INCLUSIVE, FOR NEGLIGENT INFLICTION OF EMOTIONAL DISTRESS, ALLEGE:

135. Plaintiffs re-allege and incorporate herein by reference each and every allegation and statement contained in the prior paragraphs.

136. Plaintiffs perceived the horrific burning and injuries to their beloved family member, Bern Bischof.

137. Defendants SCE and DOES 1-50, inclusive, were negligent, reckless and engaged in other wrongful conduct that caused Bern Bischof to sustain his injuries, as previously alleged in plaintiff's First Cause of Action and within this Complaint.

138. When Bern Bischof sustained injury from the explosion and burning of his body, plaintiffs were present at the scene.

139. Plaintiffs were aware that explosion and burning was causing injury to Bern Bischof.

140. Plaintiffs suffered emotional distress from perceiving Bernie burn alive.

139. Plaintiffs sustained physical injuries in addition to suffering emotional distress.

141. Plaintiffs were within in the zone of danger when the explosion occurred.

148. The negligence, recklessness, and wrongful conduct of Defendant SCE and DOES 1 through 50, inclusive, was a substantial factor, as well as direct, legal and proximate cause, in causing injuries to Plaintiffs Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko, including but not limited to serious emotional distress, suffering, anguish, fright, horror, nervousness, grief, anxiety, worry and shock, requiring treatment and counseling.

PRAYER

Wherefore, Plaintiffs Bern Bischof, Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko, pray for judgment against the Defendants, and each of them as follows:

AS TO THE FIRST CAUSE OF ACTION DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 1-50, INCLUSIVE, FOR NEGLIGENCE:

1. General damages including damages for pain and suffering and mental and emotional distress, in an amount to be determined at the time of trial;
2. Special damages including damages for past and future medical care, lost earnings, and lost earning capacity in an amount to be determined at the time of trial;
3. For property damage according to proof;
4. Punitive damages, as to Defendant Southern California Edison Company and Does 41-50 only, for the oppressive, malicious or fraudulent conduct of Southern California Edison Company and Does 41-50 only, in an amount to be determined at trial;
5. Prejudgment interest according to proof;
6. Costs of suit; and
7. Such other and further relief as the Court deems proper.

AS TO THE SECOND CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 51-90, INCLUSIVE, FOR STRICT PRODUCTS LIABILITY:

1. General damages including damages for pain and suffering and mental and emotional distress, in an amount to be determined at the time of trial;
2. Special damages including damages for past and future medical care, lost earnings, and lost earning capacity in an amount to be determined at the time of trial;
3. For property damage according to proof;
4. Punitive damages, as to Defendant Southern California Edison Company and Does 81-90 only, for the oppressive, malicious or

fraudulent conduct of Southern California Edison Company and Does 81-90 only, in an amount to be determined at trial;

5. Prejudgment interest according to proof;
6. Costs of suit; and
7. Such other and further relief as the Court deems proper.

AS TO THE THIRD CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 51-90, INCLUSIVE, FOR NEGLIGENT PRODUCTS LIABILITY:

1. General damages including damages for pain and suffering and mental and emotional distress, in an amount to be determined at the time of trial;
2. Special damages including damages for past and future medical care, lost earnings and lost earning capacity in an amount to be determined at the time of trial;
3. For property damage according to proof;
4. Prejudgment interest according to proof;
5. Costs of suit; and
6. Such other and further relief as the Court deems proper.

AS TO THE FOURTH CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 91-100, INCLUSIVE, FOR LIABILITY PURSUANT TO PUBLIC UTILITIES CODE SECTION 2106:

1. General damages including damages for pain and suffering and mental and emotional distress, in an amount to be determined at the time of trial;

2. Special damages including damages for past and future medical care, lost earnings and lost earning capacity in an amount to be determined at the time of trial;
3. For property damage according to proof;
4. Punitive damages, as to Defendant Southern California Edison Company and Does 91-100 only, for the oppressive, malicious or fraudulent conduct of Southern California Edison Company and Does 91-100 only, in an amount to be determined at trial;
5. Prejudgment interest according to proof;
6. Costs of suit; and
7. Such other and further relief as the Court deems proper.

AS TO THE FIFTH CAUSE OF ACTION AGAINST DEFENDANTS SOUTHERN CALIFORNIA EDISON COMPANY AND DOES 1-50, INCLUSIVE, FOR NEGLIGENT INFLICTION OF EMOTIONAL DISTRESS:

1. General damages including damages for pain and suffering and mental and emotional distress, in an amount to be determined at the time of trial;
2. Special damages including damages for past and future medical care, in an amount to be determined at the time of trial;
3. Punitive damages, in an amount to be determined at trial;
4. Prejudgment interest according to proof;
5. Costs of suit; and
6. Such other and further relief as the Court deems proper.

Dated: June 16, 2020

BENTLEY & MORE LLP

GREGORY L. BENTLEY
KEITH P. MORE
CLARE LUCICH
Attorneys for Plaintiff Bern Bischof

Dated: June 16, 2020

PANISH SHEA & BOYLE LLP

KEVIN R. BOYLE
MATTHEW J. STUMPF
Attorneys for Plaintiffs Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko

JURY DEMAND

Plaintiffs Bern Bischof, Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko hereby demand a jury trial on all causes of action that are triable to a jury.

Dated: June 16, 2020

BENTLEY & MORE LLP

GREGORY L. BENTLEY
KEITH P. MORE
CLARE LUCICH
Attorneys for Plaintiff Bern Bischof

Dated: June 16, 2020

PANISH SHEA & BOYLE LLP

KEVIN R. BOYLE
MATTHEW J. STUMPF
Attorneys for Plaintiffs Markus Bischof, Josef Bischof, Cyndie Kasko, and Jason Kasko

EXHIBIT 1

Old World German Restaurant
7561 Center Ave. #49
Huntington Beach CA 92647
Tel: 714-240-9662 Fax: 714-895-6011
www.OldWorld.ws

November 5, 2015

To whom it may concern;

I am writing to you on behalf of the West Coast Soccer League Inc. dba Old World German Restaurant located at 7561 Center Ave. #49 Huntington Beach CA 92647. Service account numbers: 3-003-4114-99/ 3-003-4116-36/ 3-003-4116-37/ 3-003-5555-98. We are a restaurant that operates inside of the Old World Village. Old World Village aka Old World Owners Association has 53 units with individual owners that belong to the Old World Owners Association. There is also common area which is the area here in the village in between the buildings and the sidewalk area where the customers of Old World Village walk to get from store to store.

A few years back the transformer which services a portion of the village and is situated on my property unit #49 blew up in the early am. Luckily it happened at that time of the early morning because typically I have patio guests dining on this patio directly on top of the transformer. We lost a large amount of business on the day that this happened and had to cancel an event we had worked on for months before. It was fixed and then good to go.

Now forward a couple years, in October 2015 a couple weeks ago in the middle of our festival which is our bread and butter for the family business. The same transformer started smoking and all of a sudden several places within my business and local businesses in Old World Village had power outages. This ended up happening on one of my busiest days of the entire year. It was horrible and I lost a HUGE amount of businesses because of this. I also had several customers bad mouth us as it was unbearably hot and because of the power outages we could not turn on the air conditioning and had to give customers their entrée money and tables reservation money back. Besides that, several of my credit card terminals were not working and again more loss of business. The good thing again was that no one suffered any injuries or worse death.

I would like Southern California Edison to remove this transformer off my property and relocate it. Who and how shall I get the ball rolling on this situation? I want this done ASAP as we are planning to remodel our patio and I want this taken care of before we start the process and also want it done before someone gets blown up in the event of another problem with the transformer.

Please get back to me and let me know where I need to start.

Thank you in advance,

B Bischof

Bern Bischof
Restaurant Owner

EXHIBIT 2

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Akbar Jazayeri
Vice President of Regulatory Operations

March 12, 2010

ADVICE 2334-E-A
(U 338-E)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
ENERGY DIVISION

SUBJECT: Rule Modifications to Accommodate Southern California Edison Company's (SCE's) Initiative to Install Above-Ground Equipment in SCE's Underground Distribution Systems Whenever Feasible

SCE hereby submits for filing the following changes to its tariff schedules. The revised tariff sheets are listed on Attachment A and are attached hereto. Pursuant to discussions with the California Public Utilities Commission (Commission or CPUC), this filing supplements Advice 2334-E in its entirety.

PURPOSE

This advice filing advises the Commission of an SCE initiative designed to enhance service reliability by reducing the duration of service outages, enhance the safety of SCE's employees and members of the public, and help protect the environment. Specifically, the proposed initiative would implement an orderly discontinuance of an existing customer option that allows for the installation of certain types of electrical equipment for distribution systems, such as transformers, in underground structures.[1]

Currently, underground installation may be requested by a customer and approved by SCE. When SCE installs underground distribution systems today, standard designs include above-ground padmounted equipment wherever feasible. But in some cases, municipalities, residential developers, and customers who request underground distribution line or service extension conversions or relocations may request that equipment such as transformers be installed below-ground, primarily for aesthetic reasons. In most cases, SCE has been able to accommodate these requests and has implemented them under the Added Facilities tariff provisions.[2] The tariffs provide that where SCE agrees, it will install facilities which are in addition to, or in substitution for the standard facilities SCE would normally install, provided the

1 This change involves all primary-voltage electrical distribution system equipment, including, but not limited to, transformers, switches and fuses, capacitors, and junction bars. The Rule 20 undergrounding of existing overhead electric wires (conductors) themselves and the removal of poles, however, is not affected by this change. Only the related transformers and other specified equipment will be installed above ground, where it is technically feasible to do so.

2 Rule 2, Description of Service, Section H, Added Facilities.

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requesting customer bears the incremental cost of such facilities. Below-ground transformers and related equipment are considered "other than standard facilities." Thus, customers pay the incremental cost of these below-ground facilities. Most such underground installations are on the customer or applicant's own property, as tariff Rule 16 requires, and the type of equipment most commonly installed underground consist of transformers. What is installed is called a Buried Underground Residential Distribution (BURD) transformer.

SCE proposes this initiative to slow the proliferation of new below-ground installation of equipment for underground distribution systems because above-ground installations improve the reliability of electric service, are safer and easier to maintain, and pose less of a threat to the environment. These important gains justify SCE no longer allowing new below-ground equipment installations in circumstances where technical or space concerns do not require them.

Upon implementation of this initiative, and wherever it is technically feasible to do so,[3] SCE will only accept designs that allow these types of equipment to be installed on standard above-ground structures or in enclosures on the applicant or customer's property.[4] This would apply to distribution systems with primary voltages of 4 kV (Kilovolt) through 35 kV for all new underground service to residential and business developments and for customer- or applicant-driven service capacity increases associated with increased demand or changes of use of existing structures, such as those associated with major remodeling projects, including where the existing equipment is installed underground.

For upgrade or replacement of equipment in existing underground installations, conversion to above ground padmounted installations may be evaluated. However, underground installations are still approved for exisiting equipment or its replacement, and it is anticipated that most equipment replacement will remain in the existing underground structure.

Although in SCE's opinion existing tariff language is broad enough to implement this initiative without any modification, SCE proposes to add clarifying language to make it clear to customers that the option of electing installation of distribution systems below-ground will no longer be available for new construction projects. Accordingly, this filing requests approval of modifications to Rule 2 - Description of Service, Rule 15 - Distribution Line Extensions, and Rule 16 - Service Extensions, to add language accommodating this initiative.

BACKGROUND

By virtue of its location, distribution equipment in underground enclosed spaces (vaults, enclosures, etc.) is more difficult to install and maintain than above-ground equipment. Also, this equipment, in many cases, is located beneath traveled public roadways. Although rare, equipment failures in these underground spaces can occur and require significant safety precautions to repair.

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3 "Technically feasible" refers to the availability of the required physical space, either readily available or through architectural design, that can be set aside to accommodate the required electrical distribution equipment necessary for SCE to serve the customer. The required space is defined by existing design standards within the operation and maintenance requirements that are in compliance with applicable safety codes and regulations such as CPUC General Orders 95 and 128.

4 Installations in walk-in vaults are acceptable, provided SCE is afforded unfettered 24/7 access.

SCE has concluded that limiting the further use of equipment in underground distribution systems would increase service reliability, provide safety benefits and help protect the environment. Installing electrical equipment above-ground versus installing it in underground vaults or enclosures helps SCE further advance these important goals.

The use of padmounted above-ground equipment is standard industry practice and has been a part of SCE's own design standards for many years. Above-ground installation is identified in SCE's Rule 16 - Service Extensions, as part of SCE's standard installations.[5] In fact, prior to the Commission's approval of Rule 16 language identifying padmount equipment as part of SCE's standard installation, the Commission issued Decision (D.) 92-03-065, which supported SCE's position concerning padmount equipment, by stating that SCE's "standard transformer in a residential subdivision is a padmount transformer."

Enhance Reliability

Operating, maintaining and repairing below-ground equipment in enclosed, confined underground spaces such as vaults is difficult and complex work. Electric service outages involving components installed in underground structures typically last much longer than those occurring above ground for the obvious reason that it usually takes much longer to locate and repair or replace a failed underground component. Below-ground equipment located in vaults and enclosures creates unique challenges for SCE's maintenance personnel. Complex and time-consuming safety precautions and procedures for vault entry such as heat scans for "hot spots" and testing for combustible gases and breathable oxygen levels must be employed. These additional procedures hamper timely service restoration. If water is present, it must be removed before electrical work can begin; that process can take hours in itself.[6] Moreover, as contaminants are typically present in the water in underground installations, water must often be trucked away to disposal sites for processing. In many cases, the equipment in the vault or enclosure may require steam or pressure-washing before work can begin.[7]

Even routine maintenance activities take longer to carry out with underground equipment. During routine circuit switching operations, for example, multiple vaults and enclosures are accessed to operate equipment. Each vault or enclosure must be opened and, at a minimum, tested for combustible gas and breathable oxygen. All of these necessary activities significantly increase the time it takes to restore electric service.

A key measure of electric system reliability is how long a power outage lasts before workers are able to restore the power. Customers will typically see their electrical service restored sooner when equipment is located above ground than when it is installed in below-ground structures, because it takes repair crews less time to locate and repair or replace above-ground equipment.

Equipment degradation is also more likely to occur below-ground because equipment is especially susceptible to the corrosion that occurs when run-off water washes contaminants and pollutants, such as household chemicals, motor oil, and lawn fertilizer, into these structures and submerges the equipment.[8]

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5 Rule 16.D.1.g.

6 The presence of water may also delay the ability to connect to the existing equipment and thus has a negative impact on new service connectivity for customers.

7 See Pictures 1 and 2 in Appendix A for examples of water accumulated in below-ground structures.

8 See Pictures 3 and 4 in Appendix A for examples of the corrosion of this equipment.

In addition, the SmartGrid technologies,[9] which further enhance system reliability and reduce outages, require that certain electrical equipment, such as controls and telecommunication antennas and sensitive electronic circuitry associated with the equipment, be located above ground. Allowing customers to choose a below-ground equipment option would hamper SCE's important efforts to integrate the SmartGrid technologies into its electrical system.

Secure Safety Benefits
Electrical equipment such as transformers and switches fail from time to time. Catastrophic equipment failures are rare, but do occur. When a catastrophic failure occurs, pressure inside an underground structure can build up and can be released through a rapid discharge of high energy. The release of this energy could result in the rapid exhaust of hot gases or flames.[10]

While underground installations are relatively safe with proper precautions, SCE's goal is to achieve additional safety protections where reasonably feasible. An incremental enhancement of safety is reasonable through the use of above-ground equipment, given that most underground installations are made purely for aesthetic reasons.

Environmental Protection
Water can accumulate in underground structures even in the absence of rain. The structures collect run-off, which is often contaminated with materials such as motor oil, pesticides and other substances. This water must be pumped out of the underground vault or enclosure, tested, and removed for proper treatment and disposal as required by environmental laws.[11] Moving away from underground installations will reduce the number of collection points for standing and contaminated water.

Implementation Plan
Upon Commission approval, the types of equipment described above will be required to be located in above-ground padmounted structures in new installations when technically feasible, whether designed by SCE or third-party developers.

Following a transitional grace period of 90 days after the effective date of this filing, SCE will no longer accept customer or developer requests for underground distribution system installations that call for specific pieces of electrical equipment (all primary-voltage electrical distribution system equipment, including, but not limited to, transformers, switches and fuses, capacitors, and junction bars) to be installed in below-ground structures in circumstances where it is technically feasible to install the equipment above ground. Customers, developers, and governmental entities requesting SCE to install underground distribution systems would be required to utilize above-ground equipment.

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9 Smart Grid technologies will incorporate high-tech digital devices and telecommunication advancements, providing needed system intelligence for improved service reliability, increased operating efficiency, and enhanced system flexibility and security. These efforts are consistent with Title XIII of the Energy Independence and Security Act of 2007.

10 An example of this type of failure occurred during a trouble call in July of 2004 (PIR# 20041285) where a SCE crew was called out to repair a bad BURD switch. After making repairs, the crew went to energize the primary cable that is the source for this BURD. During this time frame a 600-amp primary component in an adjacent substructure failed catastrophically, causing a large flame to shoot out of the Customer Subsurface Transformer (CST) substructure where the component was located. Luckily, no employees were in the CST substructure during the failure. Had there been any employees in that substructure when the failure occurred, serious injuries may have resulted.

11 Federal Clean Water Act, State guided National Pollutant Discharge Elimination System (NPDES) legislation, local municipal regulations and ordinance, and the California Regional Water Quality Control Board (RWQCB).

SCE believes the proposed Transitional Grace Period of 90 Days, coupled with its Stakeholder Outreach activities discussed below (which have been occurring over the past several months), will allow customers ample time to prepare for this change and meet above-ground equipment design requirements.

SCE will implement this change in an effective and orderly manner. Implementation will consist of a change in design requirements that will, following the Transitional Grace Period of 90 Days after the effective date of this filing, affect new residential and commercial developments, as well as customer- and applicant-driven capacity increases (such as remodels and changes of use). Where the retrofitting, on a planned basis, of existing equipment installed in underground structures in the public right-of-way is required, and replacement with above-ground equipment is technically feasible, SCE will attempt to obtain an easement, priced at fair market value, on private property to do so. Where an easement is not available, SCE will make the new installation in the above-ground public right-of-way where technically feasible and consented to by the local government.

This implementation will take into account the realities of development and the practicalities of providing electric service in urban areas, by respecting existing below-ground equipment installations, and by affording customers and local governments the opportunity to share their ideas for aesthetic improvements when changes to existing installations are required.

Existing Underground Equipment

Where SCE has existing underground primary-voltage distribution equipment installed in below-ground structures, the equipment will continue to be operated and maintained below ground. Should existing below-ground equipment fail and result in an unplanned outage, service will be restored on an emergency basis using below-ground equipment when replacement equipment is available. Where existing below-ground equipment is required to be replaced in a planned process, such as a maintenance program or capacity upgrade, and where replacement with similar above-ground equipment would be technically feasible, SCE may evaluate converting to padmounted equipment. Where above-ground installation is not technically feasible or is not consented to, the new equipment will be installed underground.

Local Ordinances

Some municipalities in SCE service territory have ordinances that purport to restrict or even prohibit utilities' ability to install equipment above ground. While federal law, such as the Americans with Disabilities Act, and the Commission's authority in the matters of utility system design are paramount over local law,[12] and while the Commission itself and California courts have consistently affirmed this in cases involving local ordinances,[13] the Commission also prefers that the utilities consult with affected parties before making an above-ground installation.[14] SCE is committed to continue doing so, as the company is required to obey local laws on such matters as health and safety.

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[12] *See, e.g.*, California Public Utilities Commission General Order 131-D, P.U. Code § 761, P.U. Code § 762, P.U. Code § 768.

[13] *See, e.g.*, *California Water & Telephone Company v. County of Los Angeles*, 253 Cal.App.2d 16, 31 (1967) (county water ordinance cannot be applied to water company regulated by the CPUC).

[14] *See, e.g.*, California Public Utilities Commission General Order 131-D.

In new residential and commercial developments, including remodel projects and changes of use requiring electric system capacity upgrades, SCE expects developers' designs to provide for location of the equipment on private property.[15]

Stakeholder Outreach
It is a guiding principle of all important SCE projects and initiatives that they be shared with affected stakeholders in advance wherever possible, in order to answer questions and, where feasible, make adjustments to reflect stakeholder input. SCE has done, and continues to do so with this initiative. Prior to this filing, SCE has briefed dozens of representatives of local governments, representative organizations such as the League of California Cities, individual land developers and the Building Industry Association (BIA).

SCE briefed, through in person contact by its employees, cities with ordinances in place that on their face would purport to limit SCE's ability to install above ground the facilities this initiative affects. The company used written materials prepared specifically for this purpose. Other cities were briefed by letter.

A number of stakeholders expressed concern that SCE intended to simply unearth perfectly serviceable below-ground equipment and replace it with above-ground equipment. SCE assured stakeholders that this is not the company's intention. In cases where a retrofit of an existing underground equipment is contemplated to result not in a like-for-like replacement, but rather with a larger or different device, the newer piece of equipment will be installed above ground. In each case, SCE affirms its commitment to another guiding principle, that of consultation with affected stakeholders, in order to find the most acceptable above-ground location.

Appendix B to this filing provides a sample listing of the local governments and other stakeholder organizations that were briefed prior to this filing.

Subsequent to the original filing of this Advice Letter, SCE was encouraged by the Commission to conduct a workshop and other outreach to stakeholders, and SCE did so. The reduced scope of this Supplemental Advice Letter reflects the results of that outreach.

In addition, SCE will conduct workshops for stakeholders in the building industry to provide education concerning this change and the various design options whereby above-ground equipment can be better integrated into the architectural design of the project.

Aesthetic Considerations
SCE has assembled a team to research various options that would make padmounted equipment better blend visually into the surrounding landscape. Other utilities, vendors, and cities have been surveyed for relevant ideas. Safety, equipment performance (heat dissipation, corrosion, etc.), operability, inspection, installation and replacement are some of the issues that must be considered for this equipment. SCE has developed a catalog of various approved aesthetic improvement options available to customers and developers to help minimize the visual impact of above-ground padmounted equipment. The catalog ("Above Ground Equipment Initiative Aesthetic Improvement Manual" or "AIM") includes aesthetic treatments and

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15 This may be either outdoors or in walk-in vaults, provided SCE is afforded access at all times in accordance with Rule 16, Service Extensions, Section A.11, Access to Applicant's Premises..

enhancements for above-ground equipment, such as use of certain colors, screening and landscaping. Aesthetic treatments may be available, at the customer's expense, subject to tariffs and applicable safety laws and regulations. SCE is open to suggestions from its customers and will evaluate them and include them in the catalog as options, upon approval. The AIM catalog is available on the SCE website at - http://www.sce.com/AboutSCE/Regulatory/distributionmanuals/.

PROPOSED TARIFF CHANGES

SCE proposes to insert the following language into Rule 2 - Description of Service, Rule 15 - Distribution Line Extensions, and Rule 16 - Service Extensions.

> "Following a Transitional Grace Period of 90 Days after the date SCE receives Commission approval of AL 2334-E-A, SCE will no longer accept requests under the Added Facilities provision of Rule 2, Section H, for underground distribution systems that call for specified pieces of electrical equipment to be installed in below-ground structures in circumstances where it is technically feasible to install the equipment above ground. For purposes of this provision, specified pieces of equipment include all primary voltage from 4 kV to 35 kV electrical distribution system equipment, including, but not limited to, transformers, switches and fuses, capacitors, and junction bars.
>
> Where SCE has existing primary voltage distribution equipment installed in below-ground structures, the equipment will continue to be operated and maintained below ground. Should the existing below-ground equipment fail and result in an unplanned outage, service will be restored using below-ground equipment when replacement equipment is available. Where, however, existing below-ground equipment is installed on a customer's premises and is scheduled or required to be replaced in a planned process, such as a maintenance program or capacity upgrade, the replacement will be made on the customer's premises with similar, above-ground equipment, to the extent technically feasible.
>
> "Technically feasible" refers to the availability of the required physical space, either readily available or through architectural design, that can be set aside to accommodate the required electrical distribution equipment necessary for SCE to serve the customer. The required space is defined by existing design standards within the operation and maintenance requirements that are in compliance with applicable safety codes and regulations such as CPUC General Order 128."

No cost information is required for this advice filing.

This advice filing will not increase any rate or charge, cause the withdrawal of service, or conflict with any other schedule or rule.

TIER DESIGNATION

Pursuant to D.07-01-024, Energy Industry Rule 5.3(1), this advice letter is subject to Commission disposition and is submitted with a Tier 3 designation.

PROTESTS

In accordance with General Order (GO) 96-B, Sections 1.3 and 7.5.1, SCE respectfully requests the Commission exercise its discretion under these rules and handle this filing expeditiously and that it not reopen the protest period. SCE makes this request because this supplemental Advice Letter merely limits what SCE previously proposed and because protests have already been filed on the previous, more expansive version.

EFFECTIVE DATE

This advice filing will become effective upon review and approval by the Energy Division.

NOTICE

In accordance with Section 4 of GO 96-B, SCE is serving copies of this advice filing to the interested parties shown on the attached GO 96-B and A.08-03-002 service lists. Address change requests to the GO 96-B service list should be directed by electronic mail to AdviceTariffManager@sce.com or at (626) 302-4039. For changes to all other service lists, please contact the Commission's Process Office at (415) 703-2021 or by electronic mail at Process_Office@cpuc.ca.gov.

Further, in accordance with Public Utilities Code Section 491, notice to the public is hereby given by filing and keeping the advice filing at SCE's corporate headquarters. To view other SCE advice letters filed with the Commission, log on to SCE's web site at http://www.sce.com/AboutSCE/Regulatory/adviceletters.

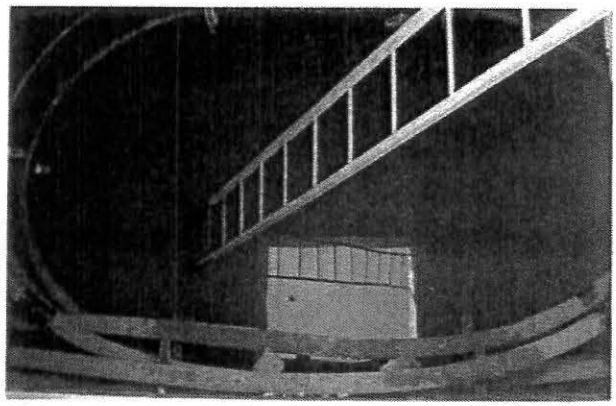
For questions, please contact Lisa Vellanoweth at (626) 302-2021 or by electronic mail at Lisa.Vellanoweth@sce.com.

Southern California Edison Company

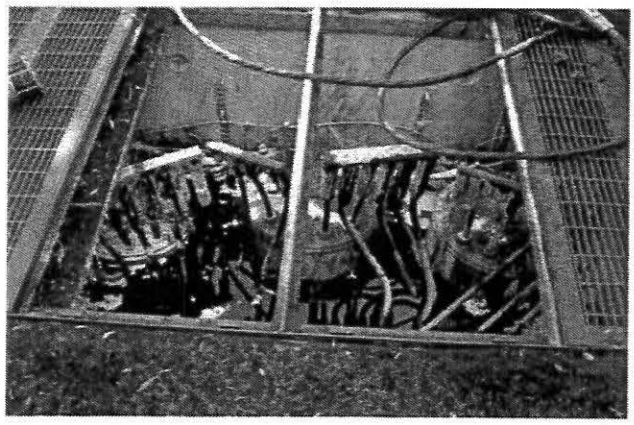
Akbar Jazayeri

AJ:lv:jm
Enclosures

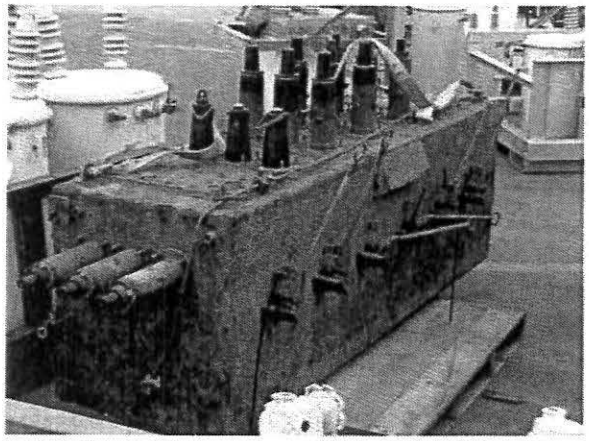
Appendix A



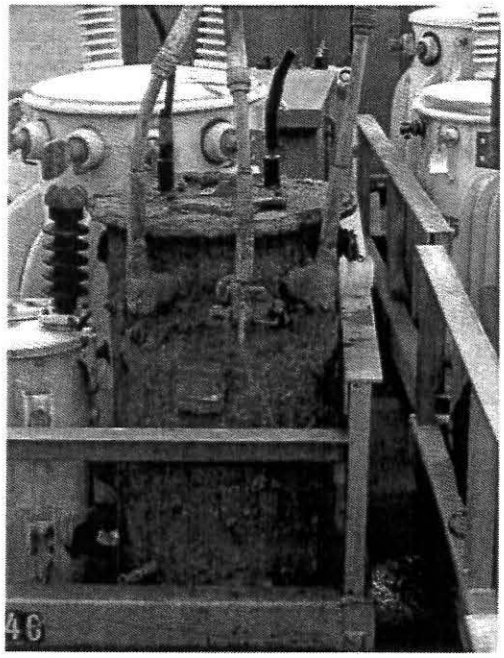
Picture 1 - A vault with what appears to be muddy water and must be tested prior to evacuation, in cases of severely contaminated water, such as this, water needs to be pumped out via a vacuum truck and sent for proper disposal. This results in additional time and resources that must be committed before electrical crews can enter the structure to begin service restoration.



Picture 2 - Example of contaminated water that will have to be evacuated and the structure power-washed before any work can be performed on the equipment.



Picture 3 – An example of a switch installed in below-ground vault that failed due to prolonged submersion under water that accumulated in the underground structure.



Picture 4 – Another example of a transformer that failed due to severe corrosion on the casing of the transformer. This transformer was installed in an underground structure that was also filled with run-off that collects various chemical and undesirable contaminants.

Appendix B

Sample listing of the local governments and other stakeholder organizations that were briefed prior to this filing.

Adelanto
Aliso Viejo
Alta Loma
Anaheim
Apple Valley
Arcadia
Azusa
Baldwin Park
Barstow
Beaumont
BIA/SC Chapter
Blythe
Bradbury
Brea
Buena Park
Building Industry Association
California BIA Quarterly Meeting - Public Utilities Working Group
Calimesa
Camarillo
Canyon Lake
CBIA Quarterly Forum (Consulting Companies & Builders
League of City Planners
Chino
Claremont
Colton
Costa Mesa
County of Orange
Covina
CPUC Consumer Protection and Safety Division
CPUC Energy Division
Cypress
Diamond Bar
Downey
Duarte
Fontana
Fountain Valley
Fullerton
Gateway Cities - PWO
Glendora
Grand Terrace
Hemet
Hesperia
Highland
Huntington Beach
Indian Wells
Industry
Irvine
Irvine Company
Irwindale
La Habra
La Habra Heights
La Mirada
La Palma
La Puente
La Verne
Laguna Beach
Laguna Hills
Laguna Niguel
Laguna Woods
Lake Elsinore
Lake Forest
League of Cities Public Works Officers
Loma Linda
Los Alamitos
Menifee
Mission Viejo
Monrovia
Montclair
Moreno Valley
Murrieta
Newhall Land
Newport Beach
Norwalk
Ontario
Orange
Orange County City Engineers Association (34 cities)
Orange County Public Works
Palm Desert
Palm Springs
Perris
Pico Rivera
Placentia
Pomona
Rancho Cucamonga
Rancho Mirage
Rancho Santa Margarita
Redlands
Rialto
Rowland Heights
San Bernardino
San Dimas
San Jacinto
Santa Ana
Santa Fe Springs
Seal Beach
Shea Homes
Stanton
Temecula
Temple City
The Great Parks Neighborhood
The Irvine Company
Town of Yucca Valley
Tustin
Twentynine Palms
Upland
Victorville
Villa Park
Walnut
West Covina
Westminster
Whittier
Wildomar
Yucaipa

EXHIBIT 3

STATE OF CALIFORNIA

EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

October 20, 2016

CPUCID: E20150921-01

Melvin Stark
Manager, Maintenance and Inspection
Southern California Edison (SCE)
3 Innovation Way
Pomona, CA 91768

SUBJECT: Notice of Violation

Mr. Stark:

On behalf of the Electric Safety and Reliability Branch of the California Public Utilities Commission, Zelalem Ewnetu of my staff conducted an investigation of an incident that occurred on September 20, 2015, in the city of Montebello. An SCE 25 kVA transformer installed in 1960 on SCE pole number 1270855E failed catastrophically. The incident caused a vegetation fire and a 2.5 hour outage to approximately 3,000 customers.

GO 95, Rule 31.1, Design, Construction and Maintenance, states in part:

> *Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.*

Our investigation revealed that the subject transformer was installed in 1960. SCE failed to upgrade the transformer since installation although the number of customers that were serviced by the transformer has significantly increased. Approximately ten days before the transformer failed, an SCE troubleman discovered that the transformer was overloaded to 199% of its rated capacity. SCE failed to upgrade the transformer prior to the incident to one that can service the anticipated load, thus creating an unsafe condition which resulted in the catastrophic failure of the transformer. Although SCE replaced the transformer with a 50 kVA transformer, SCE is still in violation of GO 95, Rule 31.1, for failing to replace or upgrade the 25 kVA transformer, prior to its catastrophic failure, with one that can properly accommodate the load and provide safe and reliable service.

General Order (GO) 95, Rule 31.2, Inspection of Lines, states in part:

> *Lines shall be inspected frequently and thoroughly for the purpose of ensuring that they are in good condition so as to conform with these rules. Lines temporarily out of service shall be inspected and maintained in such condition as not to create a hazard.*

GO 165, Section III, Distribution Facilities, states in part:

> ***"Detailed"*** *inspection shall be defined as one where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.*

In a letter dated December 31, 2015, SCE indicated that after a transformer is installed, SCE only performs visual inspections of the transformer. A visual inspection of a transformer does not constitute a thorough inspection; the use of diagnostic testing equipment, such as a heat gun, infrared camera, or temperature sticker, is an appropriate, practicable, and useful way to determine the temperature of the transformer, which may be elevated due to overloading. By depending on visual inspections, SCE precluded the possibility of its inspectors finding a dangerous overload condition. Therefore, SCE is in violation of GO 95, Rule 31.2, for failing to inspect the 25 kVA transformer thoroughly for the purpose of ensuring that is was in good condition and operating safely and properly. Furthermore, SCE is in violation of GO 165, for failing to properly perform detailed inspections of the transformer by not utilizing a diagnostic test or equipment to examine the condition of transformer.

GO 95, Rule 18-A2a, requires utilities to take "immediate actions" when unsafe conditions are discovered during inspections of their electric facilities, and to classify as "Level 1-immediate safety and/or reliability risk with high probability for significant impact."

SCE's Distribution Inspection and Maintenance Program (DIMP), Section 2.2-A defines "Priority 1: Immediate action, Temporary repairs can be made then re-rated to Priority 2."

On September 10, 2015, ten days before the incident, an SCE troubleman responded to a part-lights trouble call, and discovered a blown secondary fuse on the subject transformer, and that the current flow in the transformer's windings was high, causing the transformer to be overloaded. The troubleman replaced the blown secondary fuse and created a work order with a Priority 2 to replace the overloaded transformer by January 29, 2016. The outcome of the incident, and SCE's DIMP priority level definitions, demonstrate that the overloaded condition of the transformer warranted a "Level 1" or "Priority 1" rating. Changing a blown fuse on a transformer is not considered temporary repairs because the condition that caused the fuse to operate and interrupt the load was not eliminated or remedied. Thus, SCE improperly classified the level and priority of the unsafe condition. Therefore, SCE is in violation of GO 95, Rule 18-A2a.

Please advise me, no later than November 21, 2016, of corrective measures taken by your company to prevent the recurrence of such incidents. If you have any questions, you can contact Zelalem Ewnetu at (213) 576-7042 or ze1@cpuc.ca.gov.

Sincerely,

Fadi Daye

Fadi Daye, P.E.
Program and Project Supervisor
Electric Safety and Reliability Branch
Safety and Enforcement Division
California Public Utilities Commission

Cc: Elizaveta Malashenko, Director, Safety and Enforcement Division, CPUC
Lee Palmer, Deputy Director, Office of Utility Safety, SED, CPUC
Charlotte TerKeurst, Program Manager, Electric Safety and Reliability Branch, CPUC
Zelalem Ewnetu, Utilities Engineer, ESRB, CPUC

EXHIBIT 4

California Public Utilities Commission

INVESTIGATION REPORT OF OUTAGES DURING JULY AND AUGUST OF 2015 IN SOUTHERN CALIFORNIA EDISON COMPANY'S LONG BEACH DISTRICT

PREPARED BY

THE SAFETY AND ENFORCEMENT DIVISION

ELECTRIC SAFETY AND RELIABILITY BRANCH

LOS ANGELES

JUNE 2016

TABLE OF CONTENTS

I. Executive Summary

During July and August of 2015, in a period of high temperatures and electrical demand, Southern California Edison Company's (SCE) electrical system serving downtown Long Beach experienced multiple significant power outages, including a five-day outage from July 15 to July 20, 2015, and a four-day outage from July 30, 2015 to August 3, 2015. Along with these outages, electrical problems caused fires in underground structures, resulting in explosions that sent manhole covers airborne. There were no injuries or fatalities associated with these outages.

The Safety and Enforcement Division (SED) of the California Public Utilities Commission (CPUC) investigated the outages and discovered significant problems with SCE's maintenance, inspection, and management of the electrical system in Long Beach, and with SCE's emergency response and communications during the outages. SED found SCE violated General Orders (G.O.), in particular G.O. 128 rules on acceptable maintenance and inspection,[1] Commission Decision (D.) 14-08-009, and Public Utilities Code (PU Code) Sections 768.6 and 451.

The Long Beach outages primarily affected 3,825 customers[2] served by SCE's Long Beach secondary network, a grid of redundant underground electrical conductors, but at times extended to 30,000 customers, including customers who received their power from radial circuits that feed the network.

SED discovered serious neglect and deterioration of SCE's Long Beach secondary network, improperly configured protective devices, equipment installed without critical components, deteriorated cables, poorly constructed and failed cable splices, and improperly racked equipment. SED's investigation also revealed that SCE's inadequate knowledge of the secondary network system contributed to longer restoration times.

SED attributes these equipment problems and other issues to multiple systemic factors, including:

- Poor management of network operation and maintenance,
- SCE's inadequate knowledge of its own system,
- Inadequate inspection and maintenance activities, a confusing management structure which did not place any specific entity in charge of secondary network facilities,
- Poor maintenance management processes including inadequate methods for recording problems in the network and assuring that problems were addressed in a timely manner, and
- Inadequate training for people performing work on the network, out-of-date network maps and schematics, and inadequate risk assessment.

[1] See "Violations", Section X in this report.

[2] The term "customers" refers to one metered account on SCE's billing system. For example, one household can be a customer. Additionally, a multi-unit complex with only one SCE meter is also considered a single customer. This definition will be used henceforth in the report.

In addition, SED found evidence that employees working on the network expressed concern over the maintenance of the network prior to the outages, but this information failed to reach appropriate levels in SCE and SCE did not act on this information. In one specific instance, a 2011 SCE internal report delineated multiple problems with the Long Beach secondary network. The presentation predicted a high possibility of a catastrophic failure of the network in the event of the failure of an important network component (e.g., a primary feeder circuit). SCE never fully completed this risk assessment, and failed to fully formulate and implement a comprehensive corrective action plan for the network.

SED also found multiple problems with SCE's emergency response to the outages, primarily with SCE's communications with Long Beach officials and first responders, as well as communications with the public. Among other issues, SED also found problems with SCE's restoration time estimates.

Although the outages at times extended to tens of thousands of customers, these periods of large outages were transient in nature. However, for a core of around 3,800 business and residential customers, many of whom were elderly or low income, the outages were lengthy, uncomfortable, costly, and potentially dangerous. Though a significant consideration, the size and duration of the outages is not the biggest factor of concern for SED. The most significant fact is that these outages were not triggered by any external event beyond the control of the utility, like massive outages caused by wind, snow, rain or heat storms. Rather, the 2015 Long Beach outages would have been completely avoidable with proper secondary network inspection, maintenance and operation protocols.

II. Introduction

On July 15-20, 2015, and on July 30 to August 3, 2015, the City of Long Beach experienced major power outages that affected a great number of customers. At the peak of the outages, approximately 30,000 customers were without power. These outages were due to equipment failures on SCE's secondary network system, a grid of conductors, protective devices, and associated equipment that serve the downtown Long Beach area. Although there were no fatalities or injuries as a result, the outages caused major hindrances to civilians, reduced public safety, and disrupted businesses throughout the City of Long Beach.

This report looks into the causes of the outages, SCE's communication with customers and public officials during the outages, and SCE's restoration efforts. Additionally, this report makes recommendations for improvements in SCE's maintenance and operation of its network system.

CPUC General Order (G.O.) 128 contains requirements for the construction, maintenance and operation of underground electric facilities in California. The PU Code contains statutory requirements for CPUC jurisdictional entities. In a Commission proceeding, the CPUC may issue a decision that has the force of law and requires a utility to undertake corrective actions. This report examines SCE's compliance with G.O. 128, and applicable PU Code requirements and CPUC decisions.

III. Background

A. Power Delivery

Electricity is delivered to consumers through three main steps: *generation, transmission, and distribution.* In generation, electricity is generated at a power plant, which may be located in the city being served or located many miles away. Transmission lines are used to transmit electricity at high voltages to substations, where voltages are stepped down (reduced) by transformers and electricity is transmitted to customers through distribution lines.

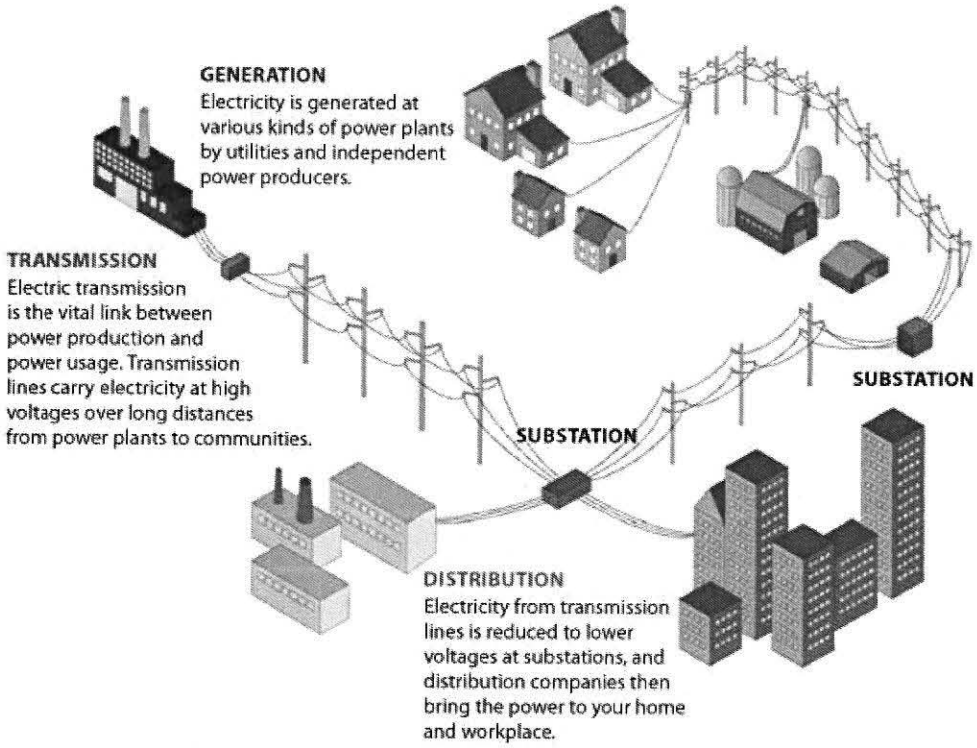


Figure 1: Typical electrical power delivery process. *Source: Indiana University*

There are two main types of electrical distribution systems: radial systems and secondary network systems.[3] In both, power comes from a substation and flows outwards to reach the consumer through distribution circuits. A substation usually provides power to several distribution circuits, with each circuit operating at a distribution voltage (also known as a primary voltage), commonly 12 kilovolts (kV). The difference between a radial system and a network system is in the configuration each uses to distribute power to customers. A description of the two systems is provided below.

[3] Secondary network systems are also commonly referred to as "network systems" in the electric distribution industry nationwide. This report will also utilize the term "network system" in reference to secondary networks in general or SCE's Long Beach secondary network system.

B. Radial Systems vs. Network Systems

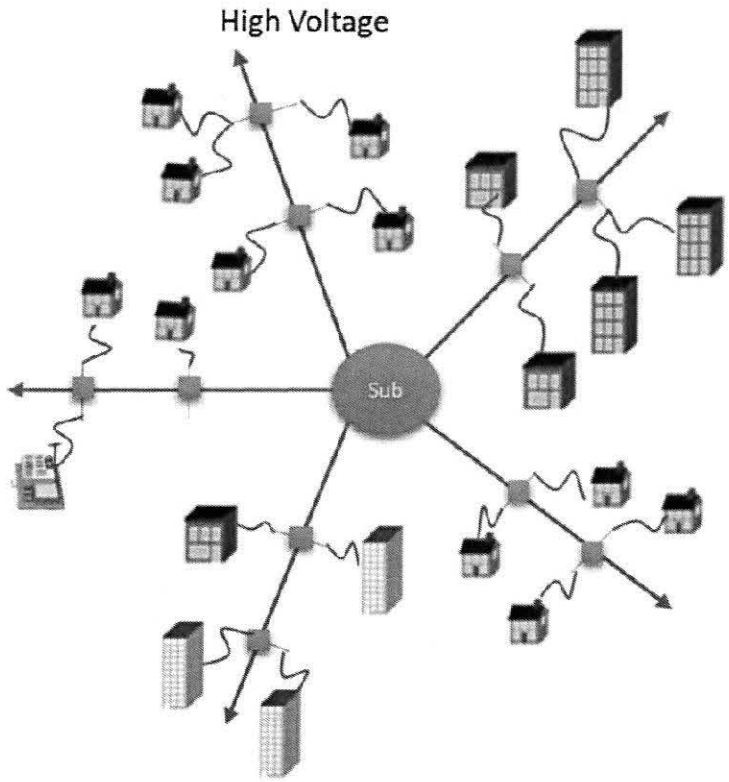


Figure 2: General schematic of a radial system. *Source: SCE*

In a radial system, each distribution circuit operates independently of the other circuits. Power is delivered to the customer from a single source (a substation) and flows outwards on distribution lines[4] that may then branch out to serve multiple customers. Each customer receives power from one circuit that connects to the substation, like a branch from a tree with a single trunk. Radial systems are the most commonly used electrical distribution system configuration due to their simplicity and cost effectiveness. However, radial systems also tend to be less reliable than network systems, as a failure of a circuit on a radial system also causes an outage to all customers who are served by the circuit.

A network system has multiple points of origins and sources of supply operating in parallel. In a network system, instead of a customer being served by a single distribution circuit, multiple distribution circuits feed into a network system that is an interconnection

[4] General Order 95, Rule 20.6, defines "circuit" as the following: "Circuit means a conductor or system of conductors located outside of buildings and through which an electric current flows or light is transmitted." General Order 95, Rule 22.1, defines "lines" as the following: "Lines mean those conductors together with their supporting poles or structures and appurtenances which are located outside of buildings." Although the General Order 95 contains specific definitions for the terms "circuits" and "lines", the two terms are often used interchangeably depending on the context. This report will follow the aforementioned convention.

of multiple distribution lines and other equipment. Each distribution circuit, referred to as a primary feeder, feeds power into the network through one or more network transformers (Figure 4) which also reduce the feeder voltage from the primary level, typically 12 KV, to a secondary voltage level (120V/208V) for use by customers. These network transformer connections are represented by the orange colored boxes in Figure 3 below. Although more difficult to construct, network systems are more reliable than radial systems because power/electricity that is lost by the failure of one circuit is compensated for by another circuit, thus, a failure of one circuit does not affect customers who are served by the network. Network systems are commonly used in densely populated metropolitan areas because of their reliability and where restoration efforts would be logistically difficult for a radial system.

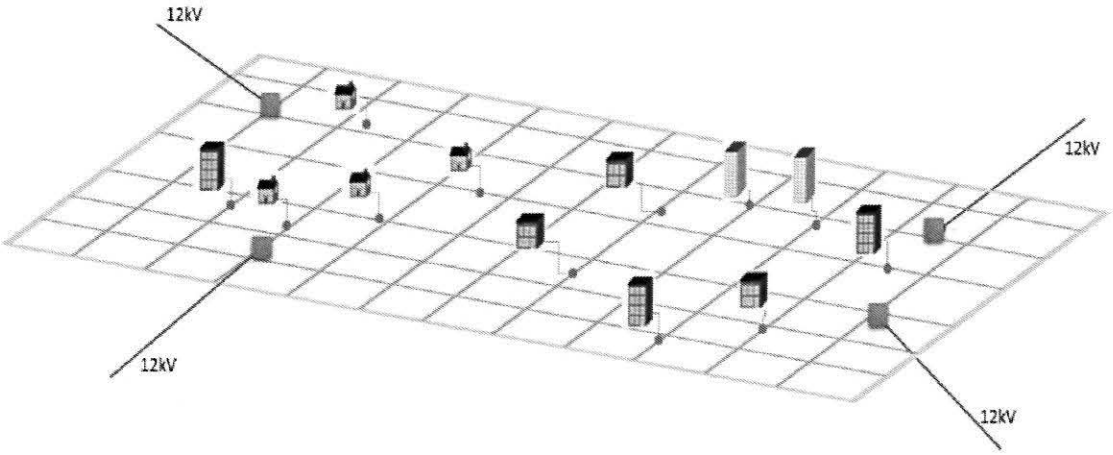


Figure 3: General schematic of a network system, each 12 kV is a primary feeder. *Source: SCE*

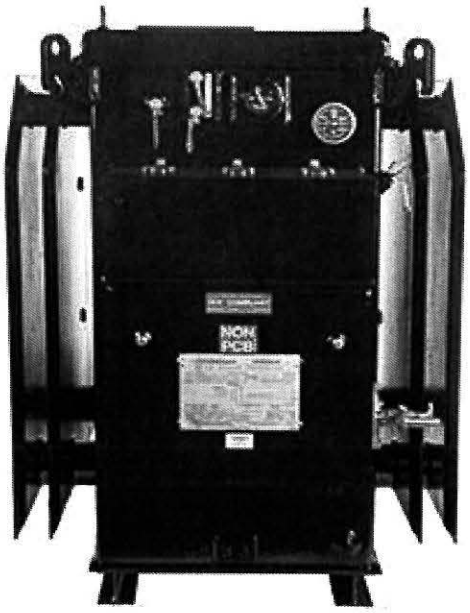


Figure 4: A network transformer. *Source: General Electric*

Although a network system is more reliable than a radial system, a network system can still suffer from circuit failures. As with a radial system, a network system also utilizes relays and circuit breakers to stop and mitigate the effects of circuit failures. Each primary feeder circuit has a relay and a circuit breaker at the substation to detect and help clear a primary circuit failure or fault, much like in a radial system. However, the configuration of the network system necessitates another level of protection that is not used in the radial system. This second level of protection is provided on the secondary side of the network transformer, by a critical component called a network protector (Figure 5), a specialized protective device that contains a circuit breaker and a controlling relay. Each network transformer is connected to a network protector, which can connect or disconnect the transformer from the network depending on whether the protector's internal circuit breaker is open or closed. A typical network protector has three settings – manual open, manual closed, or automatic. In the manual settings, the network protector bypasses its internal relay and remains permanently open or closed regardless of the conditions in the network or on the primary feeder circuits.

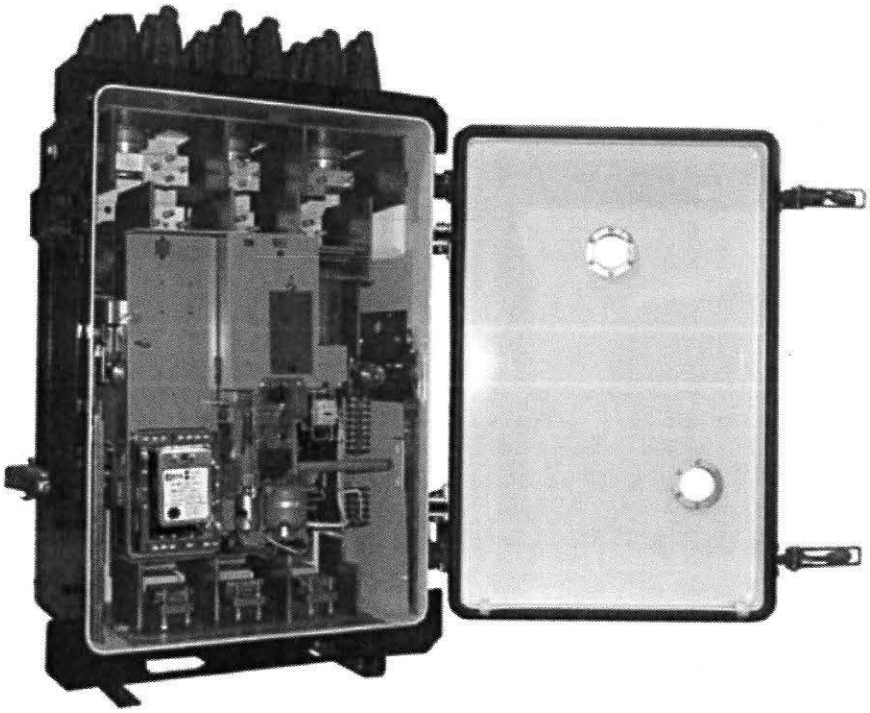


Figure 5: Example of a network protector. *Source: Richards Manufacturing, Renewal Parts Catalog, 313NP*

In a network system, current (or power) should always flow from the primary feeder into the secondary network. A network protector's purpose is to automatically disconnect its associated power transformer from the network's secondary conductors when the protector's internal relay detects reverse current flowing from the network, through the transformer, and into the feeder, typically due to a fault or de-energization of the primary

feeder. This reverse current is also called "backfeeding."[5]

During normal operations a network protector is set in automatic position and it "opens" or "closes" by itself based on fault conditions in order to protect the network conductors and primary feeders.

If a network protector is set in the manual open or closed position, this bypasses its internal relay and the circuit breaker within the network protector remains in either the open or closed position regardless of conditions in the network or on the feeder circuit. A network protector in the manual open position is undesirable as it typically denotes a problem on the network system, which must be rectified as soon as practicable. Additionally, placing network protectors in the manual open position results in fewer network protectors supplying power to the secondary network conductors. This causes current to be transmitted by fewer network transformers and secondary conductors, causing stress to these facilities. This may also lead to a drop in voltage on the network, which can further stress the secondary conductors.

A network protector in a manual closed position is also undesirable because it is not be able to interrupt the current from backfeeding into the primary feeder in case of a fault on the primary feeder.

In addition to network protectors, another protective device in a network system is a device called a mole limiter. A mole limiter is used to protect secondary cables by acting as a fuse and burning open in the event of a fault on the secondary network. When a mole limiter burns open, the section of secondary conductor connected to it is no longer be available to carry current. This causes the current to be carried by the remaining secondary cables, thus causing stress on those remaining cables. Therefore, in order for mole limiters to be used properly, they should be replaced any time they burn open. Network protectors and transformers may also contain their own internal fuses.

Although more difficult to construct, and with more equipment to monitor and maintain, network systems are more reliable than radial systems. Under normal circumstances, an outage in one area of a network system typically has no effect on the network customers. This is due to the redundancies in the network system attributed to multiple primary feeder circuits, and multiple secondary conductors providing multiple pathways to serve a customer. Network systems are commonly used in densely populated metropolitan areas where restoration efforts would be logistically difficult and would simultaneously impact many customers. The network system in the City of Long Beach is the only area in SCE's service territory where a network system is utilized.

C. SCE's Long Beach Network System

SCE's Long Beach secondary network system covers approximately one square mile and serves more than 3,800 customers in the Downtown Long Beach area (Figure 6). The

[5] Backfeeding is a reverse current that flows from the secondary side of the network transformer onto the primary feeder circuits. This can perpetuate fault conditions on the primary feeder circuits causing secondary network cables to potentially overload and fail.

network system was constructed in the mid-1920s, and the last major outage to affect the Long Beach network system was in 1959. A total of 62 network protectors of varying models regulate the Long Beach network system. The majority of network system circuitry is located underground and is accessible through manholes and underground vaults. There are a total of ten primary feeder circuits that supply the Long Beach network system. The primary feeders serve customers on a radial system and the network system, and originate from three different substations: Seabright substation, State Street substation, and Cherry substation. The ten primary feeder circuits are:

- Float 12kV Circuit (out of Seabright substation)
- Steam 12kV Circuit (out of Seabright substation)
- Cargo 12kV Circuit (out of Seabright substation)
- Ocean 12kV Circuit (out of Seabright substation)
- Chestnut 12kV Circuit (out of State Street substation)
- Loop 12kV Circuit (out of State Street substation)
- Tribune 12kV Circuit (out of State Street substation)
- Afton 12kV Circuit (out of Cherry substation)
- Dusk 12kV Circuit (out of Cherry substation)
- Hoback 12kV Circuit (out of Cherry substation)

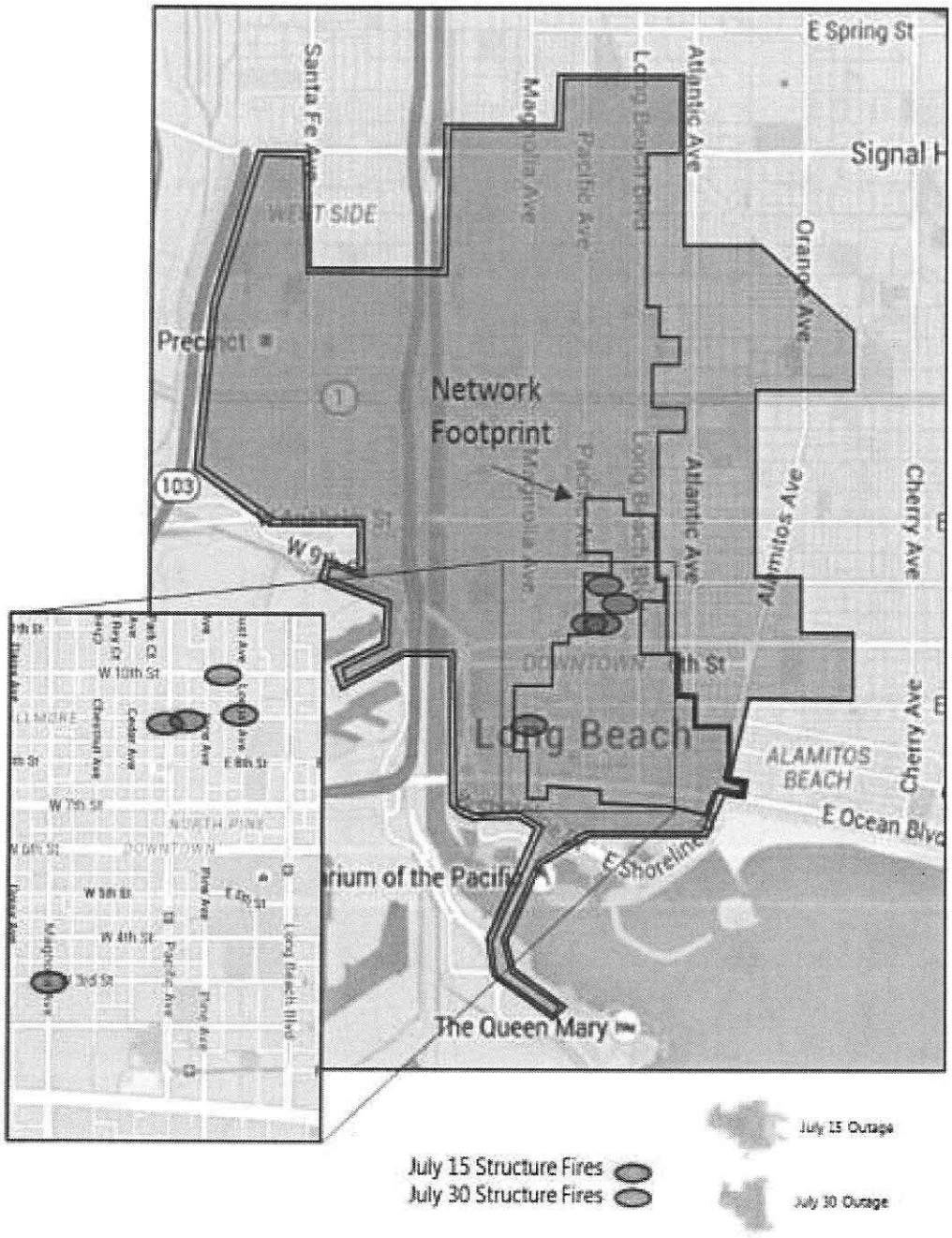


Figure 6: Downtown Long Beach Network System footprint and area of outages. *Source: SCE, California State Legislature Town Hall: 2015 Long Beach Power Outages, August 22, 2015.*

IV. Cause and Sequence of Outages

During the months of July and August 2015, the City of Long Beach experienced two major events that resulted in outages to a high number of customers. At the peak of the outages, approximately 30,000 customers were simultaneously without power during the hot summer weather. The first outage event occurred during July 15-20, 2015, and the second outage event occurred during July 30, 2015, to August 3, 2015. The following shows the cause and sequence of events that are related to the outages and their effect:

A. July 15-20, 2015, Outages Causes

The precipitating event for the July 15, 2015, outages was insulation degradation and ignition of the Float 12kV Paper Insulated Lead Cable (PILC) splice. The splice failure also contributed to the accelerated and premature failure of the Steam 12kV PILC splice, as they were located in the same vault. The fire or electrical arcs from the Float 12kV PILC splice caused collateral damage to the Steam 12kV PILC splice. The failures of the Float and Steam 12kV PILC splices caused their respective circuits to relay and lockout,[6] ultimately de-energizing the circuits and significantly reducing the number of network protectors available to regulate and protect the network system, as well as interrupting power to SCE's radial network customers that are served by the Float and Steam 12 kV circuits.

Figure 6: Float 12kV (front) and Steam 12kV (rear) PILC splices. *Source: CPUC*

[6] A protective device, such as a relay, detects a fault current or other abnormal conditions on the circuit and responds by tripping open a circuit breaker at the substation, de-energizing the circuit. Often, an abnormal condition may be temporary; therefore, it may be practicable for the utility to quickly reclose the circuit breaker and re-energize the circuit. In the *reclosing* process, a relay may attempt to open and reclose a circuit breaker several times to clear a temporary abnormal condition. If the abnormal condition persists after a preset number of reclosures, then the circuit breaker remains or "locks out" in the open position. This process is referred to as "relaying to lockout".

The Float 12 kV circuit is connected to the network system through several network transformers, including a network transformer connected to Network Protector (NP) 20649. When the Float 12 kV PILC splice failed, the breaker (at Seabright substation) that protects the circuit detected the fault current and de-energized the circuit. In a radial system this would de-energize any transformer that is connected to the circuit. However, because in a network system all the secondary circuits are connected together and supplied by multiple feeders, the secondary side of the network transformer connected to the Float 12 kV circuit remained energized. This in turn caused the primary side of the network transformer to remain energized. Thus, the portion of the Float 12 kV conductor between the splice and the network transformer it connects to remained energized. Any current on this section of conductor will dissipate in the ground in the form of fault current (since the splice will be in direct contact with ground after it failed). The fault current in such a case is caused by backfeed current. Since the secondary side of the network transformer is still energized at 120/208V, and because the failed splice is grounded at effectively zero potential (voltage), current will naturally attempt to flow from the secondary side of the network transformer to the primary side through the conductor and through the splice, and dissipate in the ground, thus producing fault current.

In a properly configured and maintained network, this reverse current flow and fault current would not occur, preventing the cascading events of July 15, 2015. The relay of NP 20649 would sense that the initial voltage on the network transformer primary side was lost (when the breaker at Seabright substation opened and locked out) and would force the circuit breaker of NP 20649 to open, disconnecting its associated transformer from the secondary conductors. This would prevent any reverse current flow from the secondary side to the primary side, thereby preventing any backfed fault current into the primary feeder.

However, in this case, SED's investigation revealed that SCE had previously set NP 20649 in the manually closed position. This prevented NP 20649 from interrupting the flow of current into the primary side fault. The fault current originated from currents flowing on many of the secondary conductors of the network system, and because the failed splice was grounded, this provided a path that "drained" current from the secondary conductors. This overstressed the secondary conductors, caused them to overload and heat which damaged and burned their insulation. Continual feeding of the Float splice ground fault also likely caused that portion of the feeder conductor to overheat and burn. As a result, fires started in manhole numbers M5133091, M5133092, and M5133093, which contained the damaged secondary conductors. In addition, the fire also damaged other equipment as well as the Steam 12 kV PILC splice, contained in the same vault. SCE responded to the fire and decided to shut down the entire network in order to troubleshoot the cause of the fire and to allow the fire department to safely extinguish the fire.

B. July 15-20, 2015, Sequence of Events

The following is a sequence of events that describe SCE's response to the outage events and the effect of each event:

July 15, 2015

- 9:28AM – SCE crew transferred load from the Bow 12kV circuit (which was not a primary feeder circuit for the Long Beach network system), to the Float 12kV primary feeder circuit in order to isolate vault number V5408333 on the Bow 12 kV circuit for routine underground work. By transferring the load from the Bow 12 kV circuit to the Float 12 kV circuit, the load on the Float 12 kV circuit increased considerably.

- 3:07PM - A PILC splice in vault number V5134053 on the Float 12kV primary feeder circuit out of Seabright substation failed, causing the circuit to relay to lockout. This failure may have been due in part to the increased load from the load transfer.

- 3:32PM – A PILC splice on the Steam 12kV primary feeder circuit contained within the same underground vault as the aforementioned Float 12kV primary feeder circuit splice also failed, causing the Steam 12kV primary feeder circuit to relay to lockout.

- 3:45PM – A fire started at manhole number M5133092 located at 3rd Street and Chestnut Street. Two adjacent manholes, numbered M5133091 and M5133093, begin smoking due to secondary cables becoming overstressed.

- 4:22PM – An SCE troubleman responded to the fire at 3rd Street and Chestnut Street and requested that the Cargo 12kV primary feeder circuit, a portion of which was in the manholes numbered M5133091, M5133092, and M5133093, be shut down to minimize damage to equipment, and create a safe condition for fire department personnel to extinguish the fire. The Cargo 12kV primary feeder circuit is subsequently shut down.

- 6:21PM – SCE Grid Operations proactively de-energized the Chestnut 12kV, Loop 12kV, and Tribune 12kV primary feeder circuits in an attempt to de-energize the entire network system to troubleshoot the problem. At this point, SCE believed that the entire network system was de-energized, but three primary feeder circuits – Afton 12kV, Dusk 12kV, and Hoback 12 kV remained energized. This was due to inaccurate maps of the network system that SCE Grid Operations was using at the time.

- Approximately 7:00PM – Customers report low voltage conditions in the areas around 9th Street and Pine Avenue. Additionally, secondary cables in manholes numbered M5132758 and M5132761 started to fail.

July 16, 2015

- 12:00AM-12:31PM – SCE Grid Operations periodically energized and de-energized the Chestnut 12kV, Float 12kV, and Loop 12kV primary feeder circuits to troubleshoot and isolate problems on the network system.
- 12:31PM – SCE Grid Operations re-energized the network system to check for functionality. At that time, more than 21 hours after the onset of the outages, SCE discovered that the Float 12kV PILC splice in vault number V5134053 had failed.
- 12:56PM – SCE Grid Operations decides to manually open the 66kV circuit breakers feeding the Seabright, State Street, and Cherry substations. This de-energized all primary feeder circuits.
- Between 6:38PM and 8:20PM – SCE began to restore service to the Cargo 12kV and Steam 12kV primary feeder circuits.

July 17, 2015

- Approximately 9:00AM – SCE deployed approximately 21 generators to provide a temporary source of power.
- 2:58PM to 4:27PM – SCE Grid Operations re-energized and de-energized the Tribune and Loop 12kV primary feeder circuits to troubleshoot and make repairs to the network system.
- 8:51PM to 8:56PM – SCE restored service to Cargo, Float, Ocean, Loop and Tribune 12kV primary feeder circuits, and partially restored service to the Steam 12kV primary feeder circuit.

July 18, 2015

- 12:34AM to 2:31AM – SCE Grid Operations restored service to the Steam 12kV primary feeder circuit.
- 12:40PM to 12:48PM – SCE restored service to Chestnut 12kV primary feeder circuit.
- 12:48PM – SCE restored service to all customers on the network system.

July 20, 2015

- 1:02PM – SCE removed the last customers from generation units, which it had previously provided as a temporary source of power.

Figure 7 below depicts the Long Beach 1 outages (the number of customers who were without power at different times and dates during the outages of July 15 to 20, 2015).

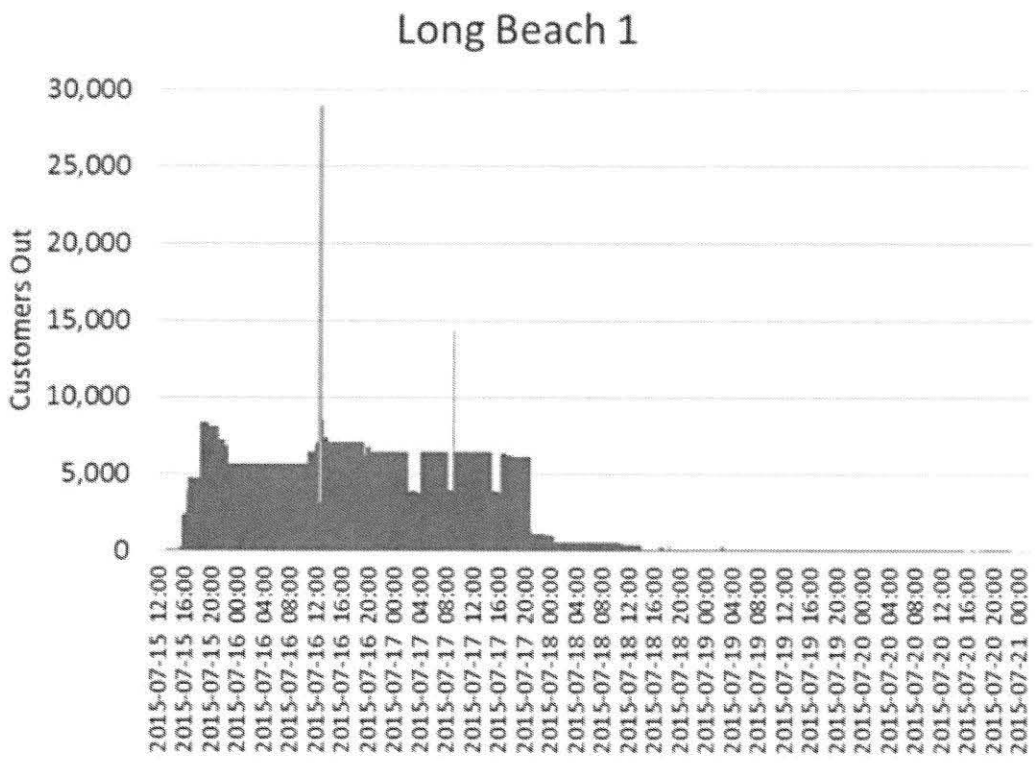


Figure 7: Number of customers out by date and time for July 15-20, 2015 outages. The large spikes in the customers out of power are due to SCE shutting off primary feeder circuits for troubleshooting purposes, causing outages to radial customers. The small customer outages after 20:00 hours on July 18, 2015, represent repairs and restoration activities for the final few customers. *Source: Davies Consulting.*

C. July 30, 2015-August 3, 2015 Outages Cause

At approximately 4:00PM on July 30, 2015, secondary conductors burned and failed in SCE vault number V5132757. The fire caused damage to sections of the Dusk and Hoback 12kV primary feeder circuits that were also in vault number V5132757, causing them to relay and lockout. In order to prevent the cascading failures experienced during the July 15-20 events and applying knowledge learned from the July 15-20 events, SCE Grid Operations proactively de-energized the State and Seabright substations. This action also consequently de-energized non-primary feeder circuits out of State and Seabright substations, in addition to de-energizing primary feeder circuits. At the peak of the outages, more than 17,500 customers were without power.

During the July 15-20 events, NP 28113, located in vault number V5132733, was set in the manual closed position with no relay installed. As explained previously, during those outages SCE proactively de-energized the Cargo 12kV primary feeder circuit in an effort

to mitigate damage to the circuit components in manholes numbered M5133091, M5133092, and M5133093. However, because other feeder circuits were still energized, the secondary conductors of the network system were still energized. This caused current to backfeed onto the Cargo 12 kV primary circuit through NP 28113. As explained earlier, this will cause the secondary conductors to overload as the network system attempts to rebalance current flow in the secondary conductors. Additionally, as current is drawn away from the network due to backfeeding, voltage may dip in the network and currents may converge and add in single conductors. These factors caused secondary conductors to sustain damage, and this premature degradation ultimately caused the secondary conductors in V5132753 to fail and ignite, initiating the following events.

D. July 30, 2015-August 3, 2015 Sequence of Events

The following is a sequence of events that describe SCE's response to the outage events and the effect of each event:

July 30, 2015

- Approximately 4:00PM – Customers around 9th street and Pine Ave. reported low voltages. At the same time, secondary conductors within vault number V5132757 began to fail and catch on fire.
- 4:43PM – The Dusk 12kV primary feeder circuit relayed to lockout. This is caused by the secondary conductor fire spreading to a section of the Dusk 12kV circuit within vault V5132757. Around this time, the cover of manhole number M5132758 is explosively blown off.[7,8]
- 4:50PM – The Hoback 12kV primary feeder circuit relayed to lockout. This is caused by the secondary conductor fire spreading to a section of the Hoback 12kV circuit within vault V5132757.
- 4:53PM – SCE Grid Operations set the Dusk and Hoback 12kV primary feeder circuit relays to immediately lockout (i.e., breaker will open and remain open) to prevent re-energization of the Dusk and Hoback circuits from the substation.
- 5:07PM – SCE field personnel reported fires in vault number V5132757 and manhole number M5132758. As a result, the field personnel requested to de-energize the Seabright and State Street substations to shut off power to only a portion of the network.
- 5:13PM – SCE Grid Operations de-energized the Seabright and State Street substations. This effectively de-energized the Chestnut, Loop, Steam, Float, Ocean, and Cargo 12kV primary feeder circuits, as well as the Mitchell 12 kV

[7] https://www.youtube.com/watch?v=R9A_RbODdL0

[8] These explosions are due to the accumulation of combustible gases in the manhole. As underground conductors, splices, or other equipment degrade, they release combustible gases, which in turn are ignited by fire, excessive heat, electrical arcs, or fault currents.

non-primary feeder circuit.

- 6:35PM-7:44PM – Partial service is restored to the Hoback 12kV primary feeder circuit, Seabright substation, and State Street substation.
- 7:44PM – Partial service is restored to the network system.
- 8:29PM-8:49PM – Partial service is restored to the Cargo 12kV primary feeder circuit
- 9:12PM-10:59PM – Partial service is restored to Cargo, Dusk, and Hoback 12kV primary feeder circuits.
- 11:03PM – The Cargo 12kV primary feeder circuit is de-energized as part of an emergency outage.
- 11:05PM – Partial service restored to the Cargo 12kV primary feeder circuit.

July 31, 2015

- 3:32AM – As part of its troubleshooting and restoration, SCE de-energized the Dusk 12kV primary feeder circuit.
- 5:08PM – SCE partially restored the Dusk 12kV primary feeder circuit.
- 8:38PM-11:09PM – SCE fully restored the Dusk and Hoback 12kV primary feeder circuits.

August 1, 2015

- 3:00AM – SCE fully restored the Cargo 12kV primary feeder circuit.

August 3, 2015

- 3:28PM –SCE restored service to all customers on the network system.

Figure 8 below depicts Long Beach 2 outages (the number of customer who were without power at different times and dates during the outages of July 30 to August 3, 2015).

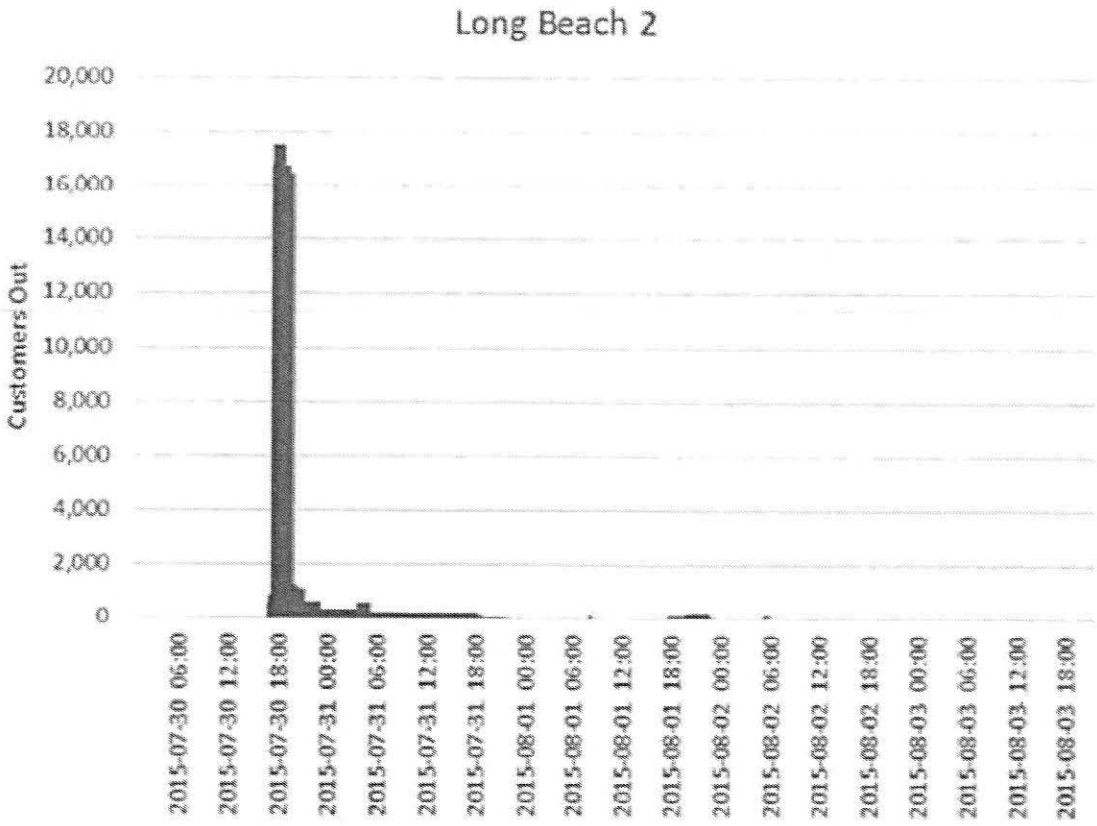


Figure 8: Number of customers out by date and time for July 30-August 3, 2015 outages. The small customer outages after 00:00 hours on August 1, 2015, represent repairs and restoration activities for the final few customers. *Source: Davies Consulting.*

V. SED Findings Pertaining to the Cause of the Outage

SED interviewed SCE staff on August 17, 2015; August 19, 2015; August 31, 2015; and October 13, 2015. Additionally, SED interviewed PG&E personnel on October 9, 2015 (SCE solicited advice from PG&E in troubleshooting and restoring the network system). SED also conducted field investigations and reviewed a large number of documents, records, and data provided by SCE. Based on these interviews, field investigations, and data reviews, SED concluded the following:

A. SCE Improperly Configured and Improperly Maintained Network Protectors

At the time of the July 15, 2015 outage, SCE had multiple network protectors that were improperly configured or missing critical components:

- Network protectors NP 20649 and NP 28113 in vaults V5134205 and V5132733, respectively, were set in the manually closed position without a relay installed.
    - NP 20649 was installed in V5134205 in December 17, 2007.
    - Sometime in 2008, the relay in NP 20649 was removed and the handle of NP 20649 was left in the manual open position. SCE could not provide an explanation of this action.
    - On October 15, 2010, an SCE Apparatus crew inspected NP 20649 and identified that NP 20649 was missing a relay. However, no follow-up or corrective action was taken.
    - On March 2, 2013, NP 20710 was installed in vault number V5132733.
    - On March 3, 2013, an SCE troubleman responded to low voltage calls in the areas and set NP 20710 in the manual closed position to address the low voltage calls.
    - On March 15, 2013, an SCE Apparatus crew was unable to inspect V5134205, which contained NP 20649, due to inaccessibility issues. The inspection was closed out, with no follow-up inspection.
    - On April 16, 2013, someone in SCE Distribution Apparatus discovered that NP 20710 would not close automatically and submitted a notification to replace NP 20710.
    - On July 31, 2014, a field crew from SCE's Long Beach District replaced NP 20710 with a new network protector numbered NP 28113. NP 28113 did not come with a relay, and the field crew telephoned Distribution Apparatus that a relay still needed to be installed. An SAP (a software program that SCE uses to manage its workload and maintenance) notification was created, but did not have a specification notification for replacing or installing network protector relays. Instead, the notification was classified under "Special Programs." NP 28113 was left in the manual closed position without a relay installed.

- On June 18, 2015, an SCE troubleman responded to a low voltage call around the areas of 3rd Street and Crystal Court, which was served by equipment in V5134205. The SCE troubleman discovered that NP 20649 was non-operational and set NP 20649 in the manual closed position to address the low voltage issues.
- On July 15, 2015, a PILC cable on the Float 12kV primary feeder circuit fails, causing the circuit to relay to lockout. Because NP 20649 (which was fed by the Float 12kV circuit) was in the manual closed position, the network system backfed onto the PILC cable failure.
- On July 15, 2015, SCE Grid Operations de-energized the Cargo 12kV primary feeder circuit, which fed NP 28113. However, because NP 28113 was in the manual closed position without a relay installed, it backfed onto the Cargo 12kV primary feeder circuit. This consequently stressed secondary conductors within manhole number M5132757, causing the insulation to degrade, contributing to the onset of the events starting on July 30, 2015.
- July 30, 2015 – Secondary cables in manhole number M5132757 failed and caught fire due to damage sustained during the July 15-20 events.

- At least two (2) network protectors were either set in the manual open position or found in the open position with a missing or inoperable relay.[9,10]
- At least six (6) network protectors, including NP 20649 and NP 28113, were missing a relay or configured incorrectly.[11]
- At least two (2) network protectors[12] were found in the manual closed position.

Leaving a network protector in the manual closed position is an unsafe condition as it can lead to backfeeding that can perpetuate primary feeder faults (as in the case of the Float 12kV splice failure) and overstress secondary network cables. Additionally, it is unsafe for workers who may enter a structure believing it is de-energized when, in fact, it is not. Ideally, network protectors should not be left in the manual closed position, and certainly

[9] SCE "NP Vault Inspection Forms" provided on August 31, 2015 indicated that network protector numbers NP 25505 and NP 20653 were found in the open position with a missing relay and in the manual open position, respectively.

[10] A network protector that is set in the automatic position with an inoperable or missing relay is equivalent to a network protector set in the manual closed or manual open position. This is because of the absence or inability of a relay to send a signal to the network protector to open or close when conditions warrant.

[11] A September 30, 2015 SCE data request response identified network protector number NP 20638 as "Configured Incorrectly", and network protector numbers NP 20649, NP 25505, NP 25505, NP 25509, NP 30397, and NP 28113 as "Missing Relay"

[12] A September 30, 2015 SCE data request response indicated that network protectors numbered NP 20649 and NP 28113 were "locked in the closed position". Additionally, "NP Vault Inspection Forms" provided on August 31, 2015 indicated that at some point during vault inspections that took place between July 29, 2015, and August 15, 2015, SCE inspectors found network protectors numbered NP 20632, NP 20647, NP 20710, NP 20721, NP 25504, and NP 30376 in the manual closed position.

not for an extended period of time. However, on July 15, 2015 SCE had at least one network protector that had been in a manual closed position without a relay in operation for more than several years.

Network protectors in the manual open position can lead to overstressed secondary cables on the network system. SCE's network system, regulated by sixty-two (62) network protectors, is designed to operate with all network protectors in the automatic setting, with an operational relay which will automatically determine whether the network protector breaker should be open or closed based on conditions in the network and on the primary feeder.[13]

As the number of network protectors that are set in the manual open position increases, fewer conductors are available to carry the load current in the network. As explained earlier, voltage in the system may dip and, as current in the network system rebalances itself in response, this may lead to secondary conductors carrying extra current and exceeding their rated ampacity, leading to overloading and failure.

Finally, without its relay installed or properly working, a network protector cannot operate for its intended purpose. Placing the protector in "automatic" will have no effect as the protector cannot automatically respond to network conditions without a relay.

B. SCE Failed to Maintain Adequate, Accurate, and Complete Network System Maps

Lack of accurate maps of its network system prevented SCE from properly de-energizing its entire network system during troubleshooting, which delayed restoration efforts and may have contributed to more damage on SCE's facilities.

At the start of the July 15th outage, SCE field personnel had incomplete and inaccurate maps of the Long Beach secondary network system. Specifically, the field map did not contain all the primary feeder circuits of the network system. The maps available to SCE's Grid Operations on July 15 only contained seven (7) of the 12kV primary feeder circuits (Float, Steam, Cargo, Chestnut, Ocean, Loop, and Tribune). Three primary feeder circuits (Afton, Dusk, and Hoback) were not on the map. This missing information complicated and prolonged restoration efforts during the July 15-20th events, as SCE would de-energize the seven primary feeders on the map under the impression that the whole network was de-energized.

C. SCE Lacks Adequate Training on the Network System

Despite the fact that multiple groups within SCE conduct work involving the network system, there is very minimal training on the network system. SED interviewed several members of SCE's Apparatus Group on October 13, 2015, and they indicated that the

[13] A network system can operate with some network protectors in the manual closed or manual open position for a very limited period of time, but a network system operates optimally with all network protectors in the automatic position with a properly functioning relay.

only network protector training SCE formally offers is a single-day training course that consists of classroom and hands-on training. The training class only covers basic information about the network in general. After the training class, there are no subsequent refresher courses. Other SCE personnel outside the Apparatus Group that work on the network system and network protectors, such as troublemen, Underground Detailed Inspection (UDI) inspectors, and Apparatus Engineers, do not receive any formal training course on network protectors. Instead, most of their knowledge is obtained through informal communications with other SCE workers and institutional tribal knowledge.[14]

SED also found the training presentation material contained inaccurate information on the network system. For example, training materials indicated that the Long Beach network system only had six (6) primary feeder circuits, when in reality ten (10) primary feeder circuits fed the Long Beach network system.

D. SCE Lacks Adequate Methods to Capture Network Protector Field Findings and to Communicate this Information Between Various Groups in SCE

Prior to the events of July 15-20, SCE's methods to capture field findings on the network protectors and to transfer that information to different groups within SCE were inadequate. Sometime in 2008, SCE adopted a new database system (SAP) to capture, store, and manage inspection information. This system did not have an adequate method to capture information pertaining to network protectors. For example, findings regarding network protectors would be classified as "Special Program" with no additional explanation of the problem or indication that it was related to the network system.

In addition, SCE Apparatus would often rely on telephone calls to notify repair crews of maintenance orders, for work both on radial systems and on the network system rather than using an automated system. As a result, critical information regarding the status of network protectors was unable to be passed on to various groups within SCE, causing them to neglect critical repairs. One such instance is when NP 20649 was set and left in manual open in 2008; since SAP did not adequately capture this information it did not reach the SCE Apparatus Group for proper reconfiguration.

E. SCE Does Not Perform Testing on its Network Transformers

Although network transformers were not directly involved with the outages, they are nevertheless a critical part of SCE's Long Beach network system. Except at the time of installation, SCE's testing of network transformers amounts to visual inspection.

SCE does not conduct any regular electric testing of network transformers, such as power factor testing, turns ratio testing, or partial discharge testing.

[14] Tribal knowledge is unwritten or undocumented information that is known by only a few individuals or small group of people within a company, but is critical to the overall quality or operation of a product or system.

Additionally, SCE indicated in its data request response dated December 18, 2015 that it does not perform oil testing on network transformers. Instead, SCE performs visual inspections on the network transformers every three years.

Oftentimes, utilities incorporate manufacturer testing specifications into their testing protocols. General Electric (GE), for example, recommends that transformer insulating oil should be sampled and tested regularly.[15] SCE employs several GE transformers in its secondary network system, but unfortunately was unable to produce the GE data sheets and maintenance manual for the network transformers associated with NP 20649 and NP 28813 (the network protectors left in manual closed position, leading to backfeeding that caused overloading of the secondary network system).

F. SCE Conducts Insufficient Inspections of Network Protectors

SED engineers reviewed inspection records of network protectors and discovered that sometime in 2008 SCE decreased its inspection frequency for network protectors from an annual basis to a three year cycle. As such, a network protector installed in 2008 would have been inspected for proper function only three times between 2008 and 2015 (at installation, once in 2011, and then in 2014). SED believes that keeping the network protector on an annual inspection frequency would increase the probability that critical network protector issues would be captured and corrected more expeditiously. For example, Richards Manufacturing, a company that manufactures network protectors SCE used in its network system (including NP 20649), recommends annual operation and electrical testing.[16]

G. SCE's Lack of Knowledge of its Own System Led to Complications in Restoring the Network System

SCE encountered several major complications during the restoration of the network system:

- At numerous instances during the outages and restoration efforts, primary feeder circuits, which served the network system and radial system, were unintentionally or intentionally de-energized. As a result, customers who are served by the radial system lost power each time the primary feeder circuit was de-energized.
- SCE did not have an established protocol for identifying and isolating major problems on the network system. As was revealed during an interview with SCE personnel on August 21, 2015, after the report of smoke coming out of vault number V5134053 on July 16 2015, SCE attempted to split the network system into three sections and re-energize the network system a section at a time rather than all at once. SCE would then energize one section, wait for a report for a smoking underground structure or cable failure, then de-energize that section. SCE attempted to use such a method to troubleshoot its circuit and determine the

[15] General Electric. *Network Transformers, Oil Immersed*

[16] Richards Manufacturing. *Network Protector Instruction Manual, Type 313NP*

source of problems. The use of such a method displays a lack of knowledge by SCE of the fundamental operation and maintenance of network systems.

- During the outages, SCE solicited the help of Con Edison (in New York) and Pacific Gas and Electric Company (PG&E).
    - PG&E manages a network system in San Francisco significantly larger than SCE's Long Beach network system. SCE requested copies of PG&E's standards for isolating issues on the network system. SED believes that this is indicative that SCE did not have extensive knowledge on how to restore the Long Beach network system in the event of a major failure.

H. SCE Demonstrated Complacency in Maintaining the Long Beach Network System

SED interviewed PG&E personnel on October 9, 2015. During this interview, the PG&E personnel indicated that managers of network systems must remain vigilant because it is easy for a utility or a group managing a network system to become complacent in the operation and maintenance of the network system, in part due to the general reliability of network systems. SED believes that SCE was complacent in its operation and maintenance of the Long Beach network system. During interviews, multiple SCE employees strongly expressed and reiterated that problems are unlikely to occur due to the reliability of the Long Beach network system, and that the last major outage on the network system was in 1959.

SCE's complacency in maintaining the Long Beach network system was due, in part, to the very redundancy in the system which made it so reliable for many years. SCE does not have this luxury in management of its radial network, given that most failures on the radial system immediately result in loss of power to customers, requiring immediate attention by SCE. Many problems on the radial system are visible to customers, inspectors, and regulators, whereas problems on the network system may go undetected for years.

I. SCE Lacked a Defined Management Structure for the Long Beach Network System

SED interviewed personnel from various groups within SCE. Based on these interviews, SED concluded that SCE did not have a well-defined management structure for the Long Beach network system. SCE provided inconsistent and confusing information regarding which group in SCE covered what area of responsibility for the network system. Additionally, SED could not identify a singular principal entity that was responsible for maintaining the network system.

J. SCE Failed to Ensure Proper Workmanship on PILC Splices

In its investigation into the Long Beach outages, SCE submitted the Float and Steam 12kV PILC splices that were contained in vault number V5134053 to IMCORP, a third

party contractor, to analyze the splices and identify risk factors to their failures. Petrelli Electric, an SCE subcontractor, constructed and installed both splices.

While IMCORP was unable to identify the cause of failure of the Float 12kV PILC splice, it identified a "significant departure" from the manufacturer's installation instructions. An air pocket around the oil tube surrounding the insulation interface was discovered, revealing uneven shrinkage around the insulation interface. This is indicative of improper installation, as the oil tube around the insulation interface should have even shrinkage according to manufacturer instructions.

IMCORP identified Petrelli's failure to remove conductive material from the joint and insulation interface as the most significant factor leading to the premature failure of the Steam 12kV PILC splice. While this does not likely represent the single actual cause of the Steam 12kV PILC splice failure (the Steam 12 kV PILC splice also sustained collateral damage from the failure of the Float 12kV splice), it signifies that the splice was not installed properly, and as such was not being used for its intended purpose.

K. SCE Failed to Properly Address Employee Warnings and Implement Internal Recommendations Related to the Secondary Network System Maintenance Problems

In a data request response dated December 18, 2015, SCE indicated that prior to the events of July 15, 2015, current members of SCE's Apparatus Group had voiced concerns to their management over the frequency of inspections of the network system. In the same data request response, SCE indicated that "[a]dditionally, several current employees stated that they had heard unverified accounts of a former apparatus foreman who voiced concerns about the switch from an annual inspection schedule to a 3 year inspection schedule for network protectors in the Long Beach Network."

Finally, SCE also reported that a 2011 SCE internal presentation identified multiple problems in its secondary network system.[17] Although SCE performed corrective action for some of the findings, it failed to complete corrective action for others.

SED believes that the findings listed above may be indicative of a corporate culture issue in which concerns from field personnel are not given adequate consideration by lower to mid-level management at SCE, and internal recommendations are not fully implemented.

L. SCE Lacks a Proper Method for Evaluating Ampacity Ratings - Transferal of the Bow 12kV Circuit Load to the Float 12kV Primary Feeder Circuit

Although a single, specific cause of failure of the Float 12kV PILC splice has not been identified, SED believes that the transfer of the Bow 12kV non-primary circuit feeder load to the Float 12kV primary circuit feeder load contributed to the failure of the Float 12kV PILC splice. On July 15, 2015 at 9:28AM, approximately five and a half hours before the Float 12kV PILC splice failed, SCE transferred the Bow 12kV circuit load to

[17] SCE, *Performance Review Long Beach Network Outage, p. 33*

the Float 12kV circuit in order to isolate vault number V5408333 to replace an underground gas switch. After transferring the Bow 12kV load to the Float 12kV circuit, the Float 12kV circuit load increased from below 30 amps to an average of approximately 270 amps and a peak of 290 amps.

Transferring a circuit's loads is a common industry-wide practice, and under normal circumstances does not cause any distribution equipment to fail. The current carrying capacity, or ampacity, of the Float 12kV circuit was 550 amps, well above the peak 290 amps that the Float 12kV circuit carried. However, this ampacity rating is made under the assumption that conductors are in new, working condition.

Resistive heating (also known as Joule Heating) is proportional to the square of the amount of current.[18] As such, when current on the Float 12kV circuit increased approximately nine fold (30 amps to 270 amps) heating of the conductor would have increased by more than 80 times. This heating is not immediate, but increases exponentially over time, and may accelerate with any cable degradation. As mentioned above, the IMCORP report identified an air pocket around the insulating tubing. If there were any other installation defects present in the Float 12kC PILC splice, these defects, in conjunction with the increased resistive heating, could lead to premature failure of the Float 12kV splice.

M. SCE Failed to Correct or Replace Deteriorated Equipment and Cables throughout the Network System

On July 31, 2015, SED engineers entered several vaults containing network system equipment and observed multiple instances of leaking and deteriorating conductors. Additionally, in the aftermath of the July 30th events, SCE personnel conducted inspections of approximately 300 vaults within the downtown Long Beach area and identified multiple vaults with equipment in various states of disarray and disrepair, including splice damage, leaking splices, blown fuses, inoperable blowers, and heat damage. In one specific instance, disorganized cables blocked the ladder in vault number V5133089, preventing safe entry.

N. SCE Failed to Fully Utilize Network Protector Automation and Communication Capabilities

SCE inspection sheets show numerous network protectors missing radios and antennas necessary to provide automation and telemetry capabilities for the network system. Without these components, SCE cannot fully remotely monitor the condition of the network system in real time. Upon inquiry from CPUC investigators, SCE indicated that they were in the process of fully implementing these capabilities.

[18] As a mathematical formula, the relationship between heat and current may be expressed as $H \alpha I^2$, where "H" represents heat and "I" represents current in a conductor.

VI. Non-Secondary Network System Outages During the Summer and Fall of 2015

In addition to the outages on the secondary network system, the City of Long Beach experienced a number of other unrelated unplanned outages on the radial system during the summer and early fall months of 2015. In order to determine if these outages indicate significant problems in SCE's maintenance outside the secondary network system, SED requested a list of all unplanned outages affecting over 50 customers for over one hour in the City of Long Beach, for the months of July to November 2015. SCE compiled a listing including the outage date, time, location, duration and cause. A review of the information shows that most of these outages occurred during the high temperature, high load summer months, when utility distribution systems are typically stressed. The outages tapered off as the weather cooled.

A significant number of these outages were manual interruptions during the network restoration activities on July 15 to July 20, and July 30 to August 3, 2015, and have already been discussed in this investigation report. Aside from these unusual outages, the outage causes listed are typical for radial system outages during periods of high load. These include blown fuses, failed connectors, conductors, elbows, switches, transformers, and splices, trees falling against facilities, and other wire to vegetation contact (usually branches, palm fronds and other vegetation blown into conductors). While any outage is unacceptable, these types of failures are common in all utility systems. A review of reliability data for July and August 2015 (see Section VII) showed that aside from the two major outages on the secondary network system, SCE's electrical system in the City of Long Beach performed more reliably than SCE's system as a whole.

According to the data supplied by SCE, apart from the outages related to secondary network problems, the City of Long Beach experienced approximately 40 outages meeting the criteria set by SED in its data request (affecting over 50 customers for over one hour) over the five month period from July to November 2015. Of these non-secondary system outages, only one extended outage affected more than 1,000 customers[19], with the vast majority affecting under 500 customers for under twelve hours, and a significant number of outages lasting under five hours.

SED consistently emphasizes the importance of effective root cause analysis, failure trending, infrared and advanced testing, predictive maintenance, and other modern inspection and maintenance program to the utilities, in an attempt to reduce all unplanned outages on distribution facilities. In addition, SED conducts regular audits, incident and outage investigation, analysis and special investigations to ensure compliance with Commission requirements.

[19] An August 18, 2015 outage caused by a failed primary cable affected up to 2021 customers for under four hours.

VII. Historical Reliability Statistics of the Long Beach District

SCE's Long Beach District (which includes the City of Long Beach) typically enjoys high reliability when compared to reliability in SCE's overall service territory. The Long Beach secondary network in particular has performed reliably in the past, and has not experienced a major outage since the 1950s.

SED looked at SCE's Long Beach District reliability using industry standard reliability metrics – System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Customer Average Interruption Duration Index (CAIDI).

SAIDI measures the number of hours of power outage for an average customer over a time period.

SAIFI measures the average number of times an average customer experiences an outage during a time period.

CAIDI measures the average amount of time a customer is out of power for a specific outage.

Lower numbers are preferable for all metrics.

Long Beach is one of SCE's more reliable districts, likely due in part to the reliability of the secondary network. In 2014 the Long Beach District recorded a SAIDI of 66.23 compared to a system-wide metric of 112.18, and in 2013 recorded a SAIDI of 75.83 compared to the system-wide metric of 108.13.[20] Long Beach has typically been at least the second best performing district in SCE's service territory for the past 5 years.

Aside from minor variation from year to year, the three major investor owned utilities (IOUs) in the state exhibit comparable reliability. Annual reliability reports for the major IOUs are publicly available on the CPUC website. [21]

For the months of July and August, SCE's SAIDI and SAIFI metrics for the Long Beach District and system-wide are as follows[22]:

Area Covered	Dates	SAIDI	SAIFI
Long Beach District (including network outages)	July 2015	91.0	0.21
	August 2015	7.58	0.11
Long Beach District (excluding network outages)	July 2015	2.43	.015

[20] https://www.sce.com/nrc/reliability/reports/county/santabarbaracounty_district_5.pdf. Note that these metrics are for a full year.

[21] http://www.cpuc.ca.gov/General.aspx?id=4529

[22] SCE provided no statistics for August 2015 reliability excluding network outages because after July 31, 2015, virtually no secondary network system customers were without power. See Figure 8.

SCE System-wide	July 2015	17.08	0.09
	August 2015	8.74	0.07

As shown above, in July 2015, excluding the major network outages, the Long Beach District outperforms SCE system-wide in both SAIDI and SAIFI. System-wide, SCE reported a spike in SAIDI during July, no doubt partially attributed to the Long Beach outages and the generally hot, high load condition in the SCE service area during that month. The system-wide statistics return to a more acceptable level in August. Given the huge disparities caused by the network outages, these statistics, while not entirely dispositive, do not by themselves point to major neglect of the maintenance, inspection, and operations of SCE facilities in its entire service territory.

The July 15 to 19, 2015 outages, aside from all other information, and based on CAIDI numbers alone were certainly significant and problematic outages. Although CPUC General Order 166 does not apply to these outages, the General Order does set a benchmark CAIDI number of 570 which is useful in evaluating a utility's outage restoration performance. The General Order states that a utility's restoration performance shall be presumed unreasonable for a CAIDI number above 570.[23] In the case of SCE's overall performance from July 15 to 19, the CAIDI number is 574.81, and the number for July 15 alone is 2234.87. SCE's performance improved for the July 30 outage to a CAIDI of 135.56.[24]

[23] General Order 166, Standard 12, Section A. *Restoration Performance Benchmark for a Measured Event.*

[24] SCE Data Request Response SCE-Long Beach Incident-003.Q22.

VIII. SCE Emergency Response

A. Overview

In addition to technical problems in the downtown Long Beach secondary network and SCE's maintenance and inspection activities in the Long Beach District, SED examined SCE's emergency response during the 2015 Long Beach outages.

Following the 2011 windstorms in the Los Angeles area, SED conducted a similar investigation of SCE's emergency response planning and implementation, and issued several recommendations for improvement. While SCE has addressed many of the recommendations from the 2011 windstorm report,[25] most specifically through improvements in its Incident Command System (ICS), some specific problems remain, and became evident during the recent Long Beach outages.

These problems include inadequate restoration time estimates and protocols for communicating restoration activities to customers, failure to appropriately use all available communication methods with customers, difficulty for Long Beach first responders to obtain specific operational information, and inadequate risk assessment and preparation for localized incidents such as the Long Beach outages. A number of these problems were exacerbated by SCE's lack of knowledge in network system restoration protocols, which made it difficult for SCE to predict restoration time.

Long Beach experienced no injuries or major property damage as an immediate result of these outages.[26] SED notes that the City of Long Beach had developed an ICS of its own prior to these events, as well as an active Community Emergency Response Team which provided invaluable assistance during the outages. Without the assistance of Long Beach officials, first responders, and the cooperation of Long Beach residents and business customers, the outcome could have been worse.

B. Independent Consultant (Davies) Report and SED Investigation

In addition to a technical causal analysis, SCE's independent consultant, Davies Consulting (Davies), also examined SCE's emergency response to the Long Beach incident. SCE also prepared its own technical Root Cause Evaluation (RCE).

Davies conducted a comprehensive examination of SCE's emergency response, and issued recommendations in several areas, including improvements to the implementation of the emergency command structure, improved communications with the public and first responders, and better use of technology tools during the outages.

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[25] SED's windstorm report is Attachment 2 to the Order Instituting Investigation (I.) 14-03-004.

[26] One apartment fire was reportedly caused by the use of candles.

In general SED agrees with Davies' recommendations (see Attachment A), which can be found in the public Davies report.[27] SED also generally agrees with SCE's internal recommendations from its RCE (see Attachment B).

Although SED also looked comprehensively at SCE's emergency planning, and reviews SCE's full emergency plan annually under the provisions of CPUC General Order 166, SED focused its investigation on specific shortcomings mentioned by City of Long Beach staff, first responders, and residents during public meetings. SED also examined issues SCE failed to address since the 2011 windstorm.

SED will not rehash all deficiencies identified by Davies, but will discuss some of the most significant programmatic shortcomings SED identified in SCE's emergency response planning and implementation. This includes some issues identified by Davies as well as some additional problems discovered by SED.

C. SED Findings Pertaining to SCE Emergency Response

Problems with Incident Command System Deployment

A primary SED recommendation following the 2011 windstorm was that SCE fully develop an ICS based on Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS) protocols. ICS is a standard emergency management construct for "the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure."[28] SCE had implemented a nascent ICS in 2011, and has since improved its ICS, but still has some distance to go in its efforts to achieve a fully developed and mature ICS.

SCE's current Corporate Emergency Response Plan is based on an ICS structure. SCE's "Watch Team" within its Business Resiliency Group monitors its service territory for possible emergency situations requiring implementation of an Incident Management Team (IMT). The Business Resiliency Duty Manager uses special tools including Complexity Analysis to determine the severity and potential impact of threats or events. SCE will then develop an appropriate Incident Action Plan.

Both SED and Davies found problems in SCE's ICS. To characterize the most significant issue, SCE's emergency response was hampered due to SCE's initial failure in recognizing the severity of the Long Beach emergency, and SCE's subsequent difficulty appropriately scaling and implementing a response to the Long Beach network outage within an ICS structure. This, combined with SCE's limited knowledge of the difficulty in restoration of a network system appears to have led SCE to improperly classify the July 15 outages at first. This caused some delays in standing up its IMT.

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27 http://newsroom.edison.com/internal_redirect/cms.ipressroom.com.s3.amazonaws.com/166/files/201510/Report%20on%20the%20SCE%20Long%20Beach%20Outage.pdf

28 ICS Glossary, FEMA Emergency Management Institute

According to Long Beach officials and residents, SCE's response improved as the July 15 outage extended past one day, and also improved for the July 30 outage.

When the July 15th outage occurred, SCE did not fully activate its IMT until July 16, and never fully implemented its Incident Support Team. Long Beach city officials complained that SCE took too long to send representatives, particularly authoritative representatives, to Long Beach's emergency operations centers. Because of this, Long Beach first responders lacked important information and Long Beach city officials were unable to fully answer questions from residents. Davies points out that SCE did not utilize its Mobile Command Center vehicle and established geographically separated command posts. SED agrees that these are serious problems that SCE should address to prevent future recurrences.

Davies identified potential areas for improvement of SCE's ICS, recommending that SCE change its incident complexity analysis process to consider all appropriate factors, improve use of the IMT, use rosters for company emergency response teams, activate its Mobile Command unit,[29] better plan for command and control locations, and improve collaboration with local agencies. SED identified similar issues and agrees that these actions will likely improve the effectiveness of SCE's emergency response as a whole.

Specific Problems with SCE Emergency Response to Long Beach Outages

In addition to the cross-cutting problems identified above, SED identified several problems specific to the response to the July 2015 outages. Some of these issues appear to be recurring problems with SCE's incident response.

SCE Needs Better Knowledge of Customers and Areas to Effectively Plan for Emergency Response

Many downtown Long Beach residents, including some elderly residents in high rise apartments, receive electricity from the secondary network under "master meter" agreements. Under master meter agreements, building owners purchase electricity from the utility and resell it to their tenants.

In this case, SCE initially characterized this outage based on the number of "customers" out, which may have understated the actual number of residents suffering from the outages, since one "customer" might actually represent many electricity users (for example, an entire apartment building might be one customer, but represent many residents). Long Beach first responders also indicated this confusion in terminology presented some issues during the outages.

Identifying unique characteristics of various portions of its service area prior to outages, and incorporating this knowledge into its emergency planning process would allow SCE to more effectively respond to outages. SCE would necessarily treat outages in urban

[29] SCE owns large vehicles outfitted for use in an emergency. These vehicles can be strategically located for logistic planning, and are well suited for use by an IMT.

high rise areas differently than outages in primarily business areas, outages in forested rural areas, or outages in suburban areas.

For example, during the 2011 windstorm, large numbers of trees and other vegetation impeded restoration efforts. Had SCE identified the vegetation issues in this area prior to the 2011 windstorm it might have been able to plan more effectively.

Similarly, the Long Beach outages provided unique challenges. The Long Beach outages affected a significant number of elderly and immobile residents in multi-story buildings. Many of these residents rely on elevators to leave and return to their dwellings. Concerns of such residents are different than the concerns of the typical suburban customer. These people may need more face to face assistance, different types of communication activities, and emergency generators earlier than other customers.

SED recommends that SCE consider specific issues and difficulties presented by various neighborhoods or areas in its service territory as it conducts its emergency planning.

Problems with SCE's Pre-Incident or "Blue-Sky" Planning

SCE staff participates in several emergency planning drills, exercises, and training activities. SCE also invites stakeholders to participate in many of these activities. SCE performs regular outreach to stakeholders including community leaders and first responders through emails, meetings, distribution of its "pocket field guide," and development of its new smartphone application for first responders.

SCE provides staff training in NIMS emergency response protocols. Specifically, last year SCE held 38 classes in ICS, in which it trained 344 students.

During the first half of 2015, SCE's Local Public Affairs organization held a Community Forum in Long Beach. SCE also offers electrical safety training to community organizations on request. SCE co-chairs a Critical Lifelines working group focused on emergency management coordination between utilities and government agencies.

CPUC General Order 166 requires utilities to hold annual emergency drills and invite local stakeholders.[30] For General Order 166 drills, SCE invites officials at the county level rather than the city level. SCE held emergency planning "Rehearsal of Concept" drills in 2014 and 2015, and a full Emergency Exercise in 2014. SCE notes that Long Beach had a representative at their 2015 "Rehearsal of Concept Drill." For these drills SCE typically invites participants at a county level. SED recommends that for future emergency drills, SCE should specifically invite Long Beach city officials to participate in these exercises.

Finally, PU Code Section 768.6 requires utilities to hold biannual emergency planning meetings with local municipalities and stakeholders in their service territories. In 2015

[30] In general, G.O.166 applies only to very large scale outages affecting over 10% of a utility's service territory. Most provisions of G.O.166 would not apply to the Long Beach outages.

the utilities were required to notify stakeholders of these meetings, inform the Commission of the meetings, hold the meetings, and memorialize the meetings and then report on the meetings to the Commission.

Despite the significant emergency planning activities listed above, SCE did not hold specific meetings pursuant to PU Code Section 768.6, and did not notify the Commission of these meetings or submit copies of records of these meetings to the Commission. SCE did not fully comply with the specific requirements of Section 768.6; therefore SED finds that SCE is in violation of Section 768.6. SED notes that SCE has committed to maintaining full compliance with this regulation in the future.[31]

Problems Communicating Operational Activities to First Responders and City Officials

Although SCE liaisons and other personnel began communicating with Long Beach first responders early during the July outages, Long Beach City officials (in particular Deputy Fire Chief Rich Brandt) related that during the July 15 outages, often the available SCE staff did not have specific operational information and in some cases did not communicate specific operational activities to first responders.[32] This was also a specific problem SED identified during the 2011 windstorms.

In the case of the Long Beach outages, part of the problem arose because SCE was not always certain of the potential effects of its restoration processes on the secondary network or the rest of its radial system in the Long Beach district. SCE found that restoring power to one area might trigger a vault fire in another area. To a certain extent, at the beginning of its restoration process, SCE was operating partly by "trial and error," and was therefore unable to pass on operational information about which it was uncertain.

In other cases SCE apparently possessed information but for various reasons failed to pass it on to first responders. For example, during the outages SCE was often required to de-energize large portions of its radial network to perform work on the secondary network. This caused temporary, large scale outages of up to 30,000 customers. In most of these instances SCE stated that it informed first responders beforehand. However, in some instances it did not, presenting a security concern for first responders.

SCE Mobile Application Tool

SCE has recently developed a mobile application for use by state and local government. This application was not deployed during the outages. SED concurs with Davies that this application "is an important tool" but will not replace SCE's current liaison process.[33]

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[31] In early 2016, SCE began holding emergency plan review meetings pursuant to Public Utilities Code Section 768.6. SED staff attended one of these meetings on March 25, 2016.

[32] Long Beach officials did comment that SCE field crews were responsive and effective in their immediate response to the hazardous vault fires, and assisted in making the vaults electrically safe for firefighters.

[33] Davies Consulting. *Independent Report. Evaluation of the July 2015 Long Beach Network Outages.* P71.

SED recommends that SCE develop plans to ensure that it constantly provides all important and relevant information, including operational information to local officials and first responders.

Problems Communicating with the Public - Restoration Time Estimates

SED reviewed anecdotal evidence[34] that suggests customers expect a few basic items from their electrical provider:

- They expect their power to stay on and in the event of outages they expect the power to be restored quickly,
- In the event the utility cannot restore the power quickly, they expect to be informed frequently and accurately as to when the power will be restored and at a bare minimum the activities the utility is taking to restore the power,
- If they cannot receive accurate restoration time estimates, at a minimum they expect frequent communication to know the utility is present and involved, and
- They appreciate emergency assistance for extended outages and to be safe during the outages.

Inaccurate restoration time estimates and insufficient communication with the public regarding restoration efforts were highlighted as major issues during SCE's emergency response to the 2011 windstorms. Again, these same areas remained problematic during the 2015 Long Beach outages, as mentioned in the Davies Report as well as by residents in public fora.

The primary problem in both the windstorm and the Long Beach outages was that SCE was completely unable to accurately estimate restoration time for the grid, and in particular the secondary network. To remedy this, SCE must improve its awareness and knowledge of the network system. In addition, better automation and metering of its network protectors, as well as use of smart meters (Advanced Metering Infrastructure – AMI), SCE's Energy Management and SCE's Outage Management Systems should also assist SCE in this effort.

During outages, frequent communications with the public are essential. SCE should provide the best and most accurate restoration estimates available. Overly conservative estimates are preferable to overly optimistic estimates. If SCE cannot provide estimates, it should at the very least inform the public of what it is doing and that it understands their concern. More is better in these instances. Formalized plans which allow some leeway are preferable to either rigid communication guidelines or fully ad-hoc decisions on communications.

[34] "Anecdotal evidence" includes comments from customers during townhall meetings, and council meetings, during the Long Beach outages and windstorm incidents, as well as historical comments during various SED customer complaint investigations.

SED recommends that, to the extent possible, SCE should improve and formalize both its methodology for making restoration estimates and communicating the estimates (or lack thereof) to the public.

SCE Response to Medically Sensitive Customers

SCE identified 350 medical baseline customers (MBL) affected by the Long Beach outages. This includes 47 critical care customers with less than a 2 hour tolerance for a loss of electricity. Since the 2011 windstorm, SCE has activated telephone notification for MBL customers.

For master metered customers, SCE conducts an annual communication outreach program using multiple means of communications to reach any medically sensitive customers. SCE also works with the owner of master metered apartment buildings to ensure information is passed on to tenants. Following the outages, in several area public meetings, SCE discussed options for medically sensitive customers.

SCE identified only one master-metered resident as MBL affected by the Long Beach outages. Given the area demographics, this seems like a small number. According to SCE, this resident was only out of power for 15 minutes, therefore SCE did not attempt to contact the resident. Regardless, SED recommends that SCE continue to ensure that all medically sensitive customers, particularly those in master metered residences, are aware of and properly enrolled in its Medical Baseline program.

Use of Press, Social Media and Other Communication Methods

SCE provided information to print, television and local media during the event, and posted eight articles to its online newsroom with over 45,000 page views. SCE issued several press releases, and utilized social media sending 34 tweets, 23 retweets and two Facebook page updates during the July 15 outages, and 51 tweets and 18 retweets during the July 30 outages. SCE also utilized its own website, and experienced no technical problems during the outages.

SED notes several things about this usage of social media and traditional communication channels during these outages. First, as noted in the Davies report, the public appreciates constant communication during outages. Rigidly conforming to its "one-voice" policy and waiting for confirmed significant "facts" before initiating a communication may prove counterproductive for SCE. Customers want to know the utility is involved and is working towards solutions, regardless of whether the utility has significant progress to report. To a point, more is better with respect to communication updates.

Not all people are familiar with, or have, the capability to access information through modern communication channels. Although SCE did provide information at its distribution centers, and utilized 160 volunteers to staff the centers and provide face-to-face contact, it is apparent from resident comments at public fora that these efforts were not 100 percent effective. In a limited geographical area such as that involved in the Long

Beach downtown outages, it should be possible to plan and carry out adequate face-to-face customer contact.

SCE has no comprehensive "reverse 911" system, although it has been expanding telephone notification of planned outages to certain customers and businesses. Additionally, SCE has studied the possibility of partnering with local municipalities in order to utilize existing reverse 911 systems on a shared basis, but it currently has no specific plans in this area.

Despite the modern technology and multiple available communications channels, residents still complained that they lacked information during the outages. Many residents, in both the 2011 windstorm and the Long Beach outages, went so far as to recommend using police cars with loudspeakers to announce outage related information from the streets.

SED recommends that SCE performs a specific, comprehensive review of its existing communication methodologies, and research all potential additional communication methodologies to develop a more effective baseline communication policy, and to "think outside the box" as far as communications during outages is concerned.

Generators/Temporary Power

SCE deployed approximately 21 generators beginning at 9 AM on July 17, 2015, almost two days after the outages began. SCE continued to deploy generators until 1:02 PM on July 20, 2015. SCE deployed the generators based on City of Long Beach requests, and to facilities housing the elderly and high rise apartments. These generators provided power to several hundred residents. Given the hot temperatures during these outages, and the nature of the customers and residents in the area, SED believes SCE could have deployed these generators sooner.

SED recommends that SCE thoroughly review its policy for deploying generators in emergency situations, and implement a policy that allows it to provide generators/temporary power as soon as feasible to affected customers.

<u>Other Areas of Interest Related to Emergency Response</u>

Call Center Performance

SCE's call center is staffed 24 hours a day. SCE has had a dedicated line for first responders since 1995. Because the Long Beach outages were limited in geographical scope, the call centers were not stressed during these events. SCE received approximately 65,000 calls during the July 15 to 19 event and 22,000 calls during the July 30 event. SCE escalated 151 calls to supervisors during both events. Not all of these calls were necessarily related to the Long Beach outages.

As of October 5, 2015, SCE's Consumer Affairs Department had received a total of two formal complaints related to communication during the outages.

Emergency Supplies

SCE established distribution sites for emergency provisions during the outages and provided residents with 8,000 pounds of ice, 28,350 bottles of water, and 4,500 flashlights. In some cases SCE staff delivered these supplies to residents who were unable to pick them up at the distribution sites. During the July 15-19 outages, the Red Cross prepared food for residents. SCE prepared food during the July 30 outage.

Claims Process

Following the outages, SCE held over 15 community meetings with Long Beach residents to discuss problems with the outage response and to provide information on the claims process and SCE assistance for medically sensitive customers.

As of October 5, 2015, SCE had issued 6,751 "one hundred dollar" bill credits to direct billed customers, and 1,059 "one hundred dollar" checks to master metered customers who were without power for over 24 hours during the outages. In addition, as of the same date, SCE had received 2,806 claims related to the outages and issued 2,261 checks related to those claims. The majority of the claims related to spoiled food (2311 claims), business expenses including lost work (330 claims), and voltage and other damage (164 claims). In October 2015 the City of Long Beach filed over $434,000 in claims against SCE. According to SCE, as of March 15, 2016, 2,947 Long Beach outage related claims have been filed, and SCE has paid out $1.5 million to settle Long Beach outage related claims.

IX. SCE Response to the Long Beach Outages

On September 1, 2015, SED sent SCE a letter ordering SCE to conduct several corrective actions, summarized below:

- Perform a detailed inspection of all underground facilities that are part of the Long Beach secondary network system. These facilities include, but are not limited to network protectors, mole limiters, lead conductors, and splices. The inspections are to verify proper working conditions and proper settings.
- Confirm the ventilation system of vaults and other underground structures that require ventilation in the City of Long Beach District is working properly.
- Confirm that the manhole and vault covers of underground structures in the City of Long Beach are properly tethered and secured in the event of an underground vault explosion.
- Confirm that transformers serving the Long Beach area are properly rated to meet customer demand during peak times.
- Inspect and confirm safe and reliable operation of the circuit(s) supplying power to the Port of Long Beach, and any SPOT networks serving a large customer in the City of Long Beach.[35]

On September 30, 2015, SCE responded to SED's letter, indicating that they performed the following corrective actions, summarized below:

- After the July 15 outage, SCE inspected 329 underground structures, including 303 underground structures that were part of the Long Beach secondary network system. The inspections included inspections of the underground structures, equipment contained within the structure, underground cables and their components, splices, network protectors, and mole limiters, and verifying proper configuration of network protectors.
- As part of the above-mentioned inspections, SCE created notifications to repair or replace equipment requiring corrective action, including underground blowers used for ventilation.
- Moving forward, SCE will commence inspecting underground structures that do not contain equipment such as underground switches or transformers.
- Following the events of July 15-20, SCE has commenced performing additional tests on substation circuit breakers for primary feeder circuits connected to the Long Beach secondary network system.

[35] A SPOT network is a network transformer and network protector pair that typically serves a single, "large" customer. For example, a SPOT network may serve a large apartment building or an industrial complex.

- SCE tethered 287 underground structures in the Long Beach secondary network system.

In addition to the corrective actions addressed by SCE's Response Letter dated September 30, 2015, SCE also implemented the following corrective actions:

- During an interview with SCE Apparatus Group on October 13, 2015, SCE staff indicated that SCE issued two new standard operating bulletins after the events of July 30-August 3, 2015. One operating bulletin directed not to leave a network protector in manual closed, and the other operating bulletin indicated what a network protector without a network protector relay looked like.

- SCE appointed a single "owner" of the Long Beach secondary network system. The Long Beach Distribution Business Line District Manager became the single point of contact for work on the Long Beach Secondary Network.

SED also discovered that SCE made the following repairs and replacements following the July 15-20 events and July 30-August 3 events. Although SCE did not conduct all of the repairs and replacements in reaction to damage sustained during both events, they nonetheless are indicative of serious problems with the condition of SCE's facilities in downtown Long Beach:

- Replaced 3 network protectors
- Repaired 19 structures
- Replaced 1 underground switch
- Replaced 9 blowers
- Replaced 1 vault lid
- Replaced 2 transformers
- Replaced multiple mole limiters
- Replaced 4 leaking splices
- Installed 278 tethers
- Installed 5 network protector relays
- Re-configured 1 network protector relay
- Replaced 4053 feet of cable.

X. Violations

A. General Order 128, Rule 17.1, *Design, Construction, and Maintenance*

Rule 17.1 states the following:

> *Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.*
>
> *For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of [the] communication or supply lines and equipment.*
>
> *All work performed on public streets and highways shall be done in such a manner that the operations of other utilities and the convenience of the public will be interfered with as little as possible and no conditions unusually dangerous to workmen, pedestrians or others shall be established at any time.*

SCE violated General Order 128, Rule 17.1 in the following instances:

- Network protectors are designed to be installed and maintained in the "automatic" position in order to fulfill their intended purpose to prevent backfeeding onto the primary feeder circuits (a network protector in the automatic position will allow it to automatically "open" or "close" based on conditions that are discussed earlier in this report). Additionally, network protectors must be installed with a functioning relay in order for a network protector to be able to operate automatically. SCE did not design and install or maintain the network protectors listed below for their intended use:

  NP 20649, NP 28113, were set in the "manual closed" position instead of automatic position (which is the correct position to set network protectors).

  NP 20638, NP 20649, NP 25505, NP 25509, NP 30397, and NP 28113 were without a relay installed or with an improperly configured relay:

- As identified in the IMCORP analysis, the Float and Steam 12kV splices were constructed with major deviations from manufacturer recommended installation procedures that introduced conductive paths on areas on the splices intended for non-conductive paths. As such, the splice was not constructed, operated, and maintained as intended.

- As indicated previously, there were numerous instances of degraded and leaking cables and splices being kept in service in underground structures that were part of the network system. These leaking and degraded cables and splices could

potentially have failed and resulted in vault fires and exploding manhole covers. The following table summarizes findings SCE crew found during their vault inspections after the July 30-August 3, 2015 events:

Structure Number	Description of Findings
5132893	Damaged splice
5061887	Hot, deteriorated, and leaking cable
5132647	Leaking Splice
5133097	Leaking Splice
5133251	Leaking Lead Cable
5132736	Splice Damage
5133094	Damaged Lead Cable
5133268	Heat Damage on Splice
5133353	Leaking Splice
5134048	Splice blown open

B. General Order 128, Rule 17.2, *Inspection*

Rule 17.2 states the following:

> *Systems shall be inspected by the operator frequently and thoroughly for the purpose of insuring that they are in good condition and in conformance with all applicable requirements of these rules[.]*

Sometime in 2010, a UDI crew inspected vault number 5134205, which contained NP 20649, and did not open and check NP 20649 to verify that it was set properly (NP 20649 was in service in the manual open position without a relay installed at the time). Three years later on March 15, 2013, an SCE Apparatus crew was unable to complete an inspection of network protector NP 20649 due to inaccessibility issues (construction in the area). The inspection was closed out, and a follow up inspection was not conducted. SCE is in violation of General Order 128, Rule 17.2, for not conducting and completing a thorough inspection of NP 20649.

C. General Order 128, Rule 33.6-A, *Accessibility*

Rule 33.6-A states the following:

> *Cables and conductors in manholes, handholes, permanent cable trenches, or other similar enclosures shall be reasonably accessible to workmen and working space shall be available at all times.*

During the 300 vault inspections conducted after July 30, 2015, SCE personnel discovered that vault number V5133089 contained cables that blocked the ladder inside the vault, preventing safe entry to the vault working space. Therefore, SCE is in violation of G.O. 128, Rule 33.6-A.

D. Public Utilities Code Section 768.6

PU Code Section 768.6 states in part the following:

> *"(3) Every two years, in order to update and improve that electrical corporation's emergency and disaster preparedness plan, an electrical corporation providing service in California shall invite appropriate representatives of every city, county, or city and county within that electrical corporation's service area to meet with, and provide consultation to, the electrical corporation...*
>
> *(c) A meeting pursuant to subdivision (b) shall be noticed and shall be conducted in a public meeting that allows for the participation of appropriate representatives of counties and cities within the electrical corporation's service area...(3) An electrical corporation shall notify the commission of the date, time, and location of a meeting pursuant to subdivision (b).*
>
> *(d) An electrical corporation shall conduct a meeting pursuant to subdivision (b) no later than April 1, 2013, and every two years thereafter.*
>
> *(e) An electrical corporation shall memorialize a meeting pursuant to subdivision (b), and shall submit its records of the meeting to the commission."*

In 2015 SCE was required to hold emergency planning meeting with the public. SCE was required to notify stakeholders of these meetings, inform the Commission of the meetings, hold the meetings, and memorialize the meetings and then report on the meetings to the Commission.

SED's investigation revealed that SCE did not hold specific meetings pursuant to PU Code Section 768.6, and did not notify the Commission of these meetings or submit copies of records of these meetings to the Commission. SCE did not fully comply with the specific requirements of Section 768.6, therefore SED finds that SCE is in violation of Section 768.6. SED notes that SCE has committed to maintaining full compliance with this regulation in the future.

E. CPUC Decision 14-08-009

CPUC Decision (D.) 14-08-009 states, in part:

> *The following settlements ... are approved as reasonable in light of the record, consistent with law and Commission precedent, and in the public interest: ...*
> *(b) 2011 Windstorm Settlement Agreement Between the Safety and Enforcement Division of the California Public Utilities Commission and Southern California Edison Company.*

The approved 2011 Windstorm Settlement Agreement, which is Attachment A to D.14-08-009, states in its Section 3(C)(4):

To the extent not already completed, SCE agrees to implement all of the recommendations in the SED windstorm report.

SCE has addressed many of the recommendations in the SED windstorm report. However, SED finds that SCE failed to implement the following recommendation on page 15 of the report:

SCE should ensure it provides accurate estimated restoration time to its customers.

The need for SCE to provide accurate estimated restoration times was a central issue in the windstorm OII. In reaching their $8 million financial settlement in that proceeding, parties included $3.5 million because SCE communicated inaccurate restoration times to customers.[36] However, as described in Section VIII above, SCE still was unable to provide accurate restoration time estimates during the 2015 Long Beach outages. Therefore, SED concludes that SCE is in violation of D.14-08-009 because it has failed to implement this recommendation in the SED windstorm report.

F. Public Utilities Code Section 451

Public Utilities Code Section 451 states the following:

All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.

Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities, as defined in Section 54.1 of the Civil Code, as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.

All rules made by a public utility affecting or pertaining to its charges or service to the public shall be just and reasonable.

SCE receives funding for operations and maintenance in every General Rate Case to maintain and furnish adequate, efficient, just, and reasonable service, instrumentalities, equipment and facilities throughout its system. This includes the Long Beach secondary network.

Given that the fires, exploding vaults, and lengthy outages in Long Beach fail to promote the safety, health, comfort, and convenience of its patrons, employees and the public, and that these conditions can be traced to SCE's maintenance and operations, SED concludes that SCE violated Public Utilities Code, Section 451.

[36] D.14-08-009, mimeo. pp. 12-13.

XI. SED Recommendations

In addition to the recommendations identified in SCE's Root Cause Evaluation report and those in the independent Davies report, SED makes the following recommendations:

A. Recommendations Relating to the Network System Outages

Revisions to the Network Protector Training Class

SED recommends that SCE make several major improvements to its network protector training class. At minimum, SCE should make the following changes:

- Groups outside of the Apparatus Group that deal with the network system (e.g., SCE troublemen) should also be required to take the training class.
- Network protector class should be amended to place a greater emphasis on the proper configuration of the network relays and the hazardous consequences of leaving a network protector in the manual closed position. Doing so will reduce the occurrence of complacency in maintaining and operating the network system.
- Regularly update training material to ensure that the information is accurate and up to date.

Develop a Protocol for a More Accurate Ampacity Determination

As identified earlier, transferring the Bow 12kV load to the Float 12kV primary circuit may have accelerated the failure of the Float 12kV PILC splice. SCE's load transferal protocols currently do not take into consideration a reduction in current carrying capacity due to degradation sustained to conductors and splices over their service life. SED recommends that SCE consider developing a protocol for more accurately determining the ampacity of a circuit, rather than relying on a nominal ampacity of a circuit.

Ensure Proper Ventilation

SCE should ensure that blowers and ventilation in underground structures are in optimal condition to remove any combustible gases from the structure and aid in cooling any equipment in the structure.

Fire Prevention and Mitigation

As part of equipment installation on underground structures, SCE should investigate methods to prevent fires in vaults from starting and spreading.

Mounting and Racking of Equipment

SCE should develop standards for the appropriate mounting and racking of equipment and cables in underground structures to ensure that at all times access to equipment by SCE field personnel is not impeded.

Understanding of Network Protectors

SCE should ensure that SCE personnel tasked with installing, operating, maintaining, and inspecting network protectors are aware that all network protectors need to have a functional controlling relay and be placed in an automatic position to function as intended.

Audits of the Secondary Network

SCE should conduct and document periodic audits and condition assessments of the secondary network, and perform follow-up maintenance as necessary.

Equipment Upgrades

SCE should complete automation and telemetry upgrades to all network protectors.

Maps and Diagrams

SCE should institute programs to ensure network maps and diagrams are consistently reviewed for accuracy and accurately reflect state of the network.

System Models

SCE should develop load flow models for the network and methodologies for utilizing real time data from network protectors to monitor the network and to aid in restoration of the network.

Network Protector Relays

SCE should ensure that network protectors are never installed without relays and are always tested immediately after installation.

Manual Closed Policy

SCE should develop a policy on when and for how long network protectors can be set in manual open and manual closed positions.

Spare Parts

SCE should maintain an adequate supply of replacement parts for the network.

Maintenance Management

SCE should develop effective maintenance management processes for the network including effective electronic database forms for entering field findings for the network.

Manufacturer Recommendations

At a minimum, SCE should follow all recommendations found in instruction manuals or data sheets for maintenance and testing of network system equipment (i.e. network transformers, network protectors, etc.)

Testing

SCE should develop effective testing protocols for network protectors and network transformers.

Single Entity Management

SCE should identify a single entity responsible for oversight of the network and coordinating efforts of all groups working on the network.

Risk Management

SCE should utilize all available data for predictive maintenance and effective risk management for the secondary network including assessment of the condition of conductors, transformers, protectors and all components of the network. For effective risk management, SCE should identify all possible threats and risks, assess the severity of those risks, develop a plan to mitigate those risks, implement that plan and track it to completion. Risk assessment should be an ongoing process.

Repair Priority

SCE should prioritize repairs on the secondary network to ensure work is completed in a timely manner without unduly stressing the system.

Real Time Monitoring

SCE should develop a program to ensure that the current state of the network is known in real time. From this program SCE should develop a regular report on the state of the network.

Benchmarking

SCE should participate in regular network benchmarking efforts with other utilities.

Addressing Staff Concerns

SCE should encourage its employees to report any concerns with the condition of the network and ensure that those concerns are addressed at the appropriate level.

Inspection Practices

SCE should ensure inspection practices cover all areas of the network, including inspecting manhole tethers regularly.

Splice Construction

SCE should improve oversight and training for splice construction.

B. Recommendations Relating to SCE's Emergency Response During the Network System Outages

To improve its emergency response SED recommends that SCE:

- Review its policy for deploying generators in emergency situations, and implement a policy that allows it to provide generators/temporary power as soon as feasible to affected customers.
- Perform a specific, comprehensive review of its communication methodologies during various types of outages to arrive at a baseline policy and to "think outside the box" as far as communications during outages is concerned.
- Ensure that all medically sensitive customers, particularly those in master metered residences, are aware of and properly enrolled in its Medical Baseline program.
- Improve and formalize both its methodology for making restoration estimates and communicating the estimates (or lack thereof) to the public.
- Develop plans to ensure that it constantly provides all important and relevant information, including operational information, to local officials and first responders.
- Include consideration of the specific issues and difficulties presented by various neighborhoods or areas in its service territory as it conducts its emergency planning.
- Specifically invite Long Beach city officials to participate in General Order 166 exercises and any other emergency planning activities and exercises.

C. Recommendations Relating to SCE Corporate Culture

The July 2015 Long Beach outages exposed some cultural problems in SCE's management of the Long Beach network, which could potentially extend outside of the network.

Davies also identified cultural issues in its report, primarily related to emergency response and communication with external stakeholders.[37] SED found corporate issues related to internal communications, risk assessment, training and transmission of institutional knowledge.

SED found that:

- Prior to the Long Beach outages, SCE's apparatus group employees expressed concerns to their management about the maintenance and inspection practices for the network protectors, and other SCE transmission and distribution employees expressed concern over lack of training for the fabrication of Poly to PILC splices. Apparently SCE never addressed these concerns.
- Although SCE conducted risk assessment for the secondary network as part of its distribution system risk assessment for its rate cases, it appears that SCE's risk assessment for the network system was inadequate. For example, although SCE is performing cable assessment in other districts, it did not perform these assessments on the Long Beach secondary network. An adequate risk assessment requires an organization to consider all available data, and in addition to "think outside the box." As is seen in the Long Beach outages, simply looking at overall reliability is insufficient.
- In 2011 SCE prepared a report based on an apparent risk evaluation of the secondary network system. This report warned of catastrophic failure of the entire network system in the event of the failure of important components. Many of the problems identified in the report mirror the findings of this report, including inadequate knowledge of the system and multiple problems with the network protectors. SCE made some changes based on the report recommendations, but failed to follow through with a comprehensive corrective action plan.
- SCE's training practices for the secondary network were insufficient. Additionally, an inordinate amount of training is performed through informal channels. SED is unsure if this extends to other training in SCE, but SCE should ensure that it develops appropriate formal training when necessary and captures institutional knowledge from retiring employees for dissemination through the company.

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[37] Davies. P 78.
http://newsroom.edison.com/internal_redirect/cms.ipressroom.com.s3.amazonaws.com/166/files/201510/Report%20on%20the%20SCE%20Long%20Beach%20Outage.pdf

To improve its corporate culture, SED recommends that SCE:

- Develop programs and practices to capture and address employee concerns regarding maintenance and testing of its facilities, and to ensure that the appropriate corrective actions are taken,
- Further develop and improve its emergency response protocols and ICS implementation companywide, including the adoption of recommendations of Davies consulting and the recommendations contained in this report,
- Review its risk management practices to ensure that SCE identifies and assesses all potential risks to its system, develops comprehensive plans to mitigate those risks, implements those plans and tracks the plans to completion,
- Establish programs to capture institutional knowledge and translate this information to formal training programs where appropriate,
- Continuously review its training activities, not only related to the secondary network system but for all elements of its business, and
- Utilize formal automated work management systems to report and track work on both radial systems and the network system.

ATTACHMENT A
DAVIES REPORT RECOMMENDATIONS

Corporate Culture Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
CC-1	Fully Endorse and Communicate the Emergency Management Vision and Guiding Principles	High	Easy	Immediate
CC-2	Assign Individuals with Broad Experience to Incident Leadership	High	Moderate	Immediate
CC-3	Continue to Champion a Cooperative and Transparent Relationship with its External Stakeholders	High	Moderate	Critical

Information Technology and Operational Technology Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
ITOT-1	Ensure that Network Outages are Part of the Design Basis in the Next Release of OMS	Low	Difficult	Long-term
ITOT-2	Update the AMI Capabilities for the Networked Area (at a minimum)	High	Difficult	Long-term
ITOT-3	Update the AMI Capabilities for the entire SCE Service Territory	High	Difficult	Long(er)-term
ITOT-4	Work with External Stakeholders to Affirm the LPA Application's	High	Moderate	Short Term

	Usefulness and Update as Necessary			

Communications Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
COM-1	Develop a Comprehensive Crisis Communications Plan, Plan Framework, Modules, and Associated Processes to Address Hazards, Threats, and Risks that SCE Faces	High	Difficult	Mid-term
COM-2	Enhance the One Voice Process to Account for Different Stakeholder Needs	High	Difficult	Mid-term
COM-3	In Developing the Communications Strategy, Consider the Need to Provide Stakeholders and Response Partners with Information Beyond "Confirmed Facts"	Moderate	Easy	Short-term
COM-4	Formalize the Information Sharing and Vetting Process and Implement a Database/Portal	High	Difficult	Mid-term
COM-5	Enhance Executive Distribution Lists to Ensure Executives are Apprised of the Incident Situation and Response Progress	Moderate	Easy	Short-term

COM-6	Enhance Process for Developing and Releasing ERTs	Moderate	Moderate	Mid-term
COM-7	Assess Communication and Partnership Preparedness and Response Models	High	Moderate	Immediate

Incident Response and Management Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
IRM-1	Enhance the Incident Complexity Analysis Process	High	Moderate	Immediate
IRM-2	Where the IMT is Required, SCE Should Not Rely on Remote Activation	High	Easy	Complete
IRM-3	Use Rosters and Streamline Shifts	High	Easy	Immediate
IRM-4	Establish Accountability for Preparedness and Response Role Activation	Moderate	Moderate	Mid-term
IRM-5	Consider Limitations of Existing Command And Control Locations; Activate the Company's Available Mobile Command Centers During Significant Incidents	Moderate	Easy	Immediate
IRM-6	Collaborate with Local Agencies to Support Communities Affected by Incidents	High	Moderate	Long-term
IRM - 7	Assign responsibility for determining level of response to	High	Moderate	Critical

	Business Resiliency organization			

Emergency Planning and Preparedness Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
EPP-1	Support and Enhance Business Resiliency Efforts	High	Easy	Immediate
EPP-2	ICS Maturity Model and 'Typed' Teams	High	Moderate	Mid-term
EPP-3	Implement ICS more fully	High	Difficult	Long-term
EPP-4	Expand On-call Incident Management Teams and Move Toward a More Mature ICS Model	High	Easy	Immediate
EPP-5	Create Plan Framework	High	Easy	Immediate
EPP-6	Develop an Underground Network Restoration Process or Annex	High	Difficult	Long-term
EPP-7	Train and Exercise In-Breadth	High	Moderate	Mid-term
EPP-8	Review Current Levels of Service During Response and Update Capabilities or Expectations	High	Difficult	Immediate

Underground Network Recommendations

Number	Recommendation	Value	Ease of Implementation	Implementation Timeframe
UNO-1	Network Training and Certification	High	Difficult	Long-term

UNO-2	Develop a Secondary Network Model	High	Difficult	Long-term
UNO-3	Develop a Network Contingency Plan	Moderate	Easy	Mid-term
UNO-4	Report Voltage Exceptions for the Network	High	Easy	Immediate
UNO-5	Improve Network Modeling Capabilities	Moderate	Easy	Immediate
UNO-6	Complete all Planned Maintenance in Off-Peak Season	High	Easy	Immediate
UNO-7	Continue the Underground Network	High	Easy	Immediate

ATTACHMENT B

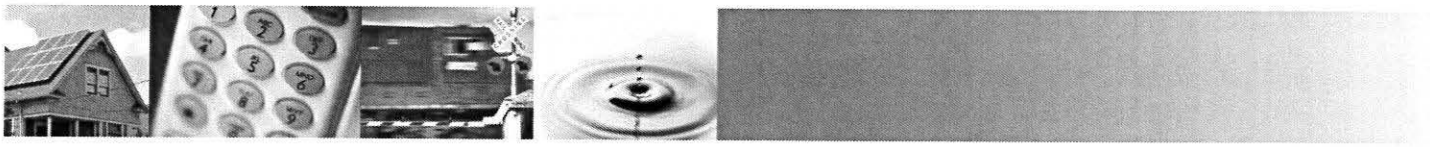
SCE's INTERNAL RECOMMENDATIONS

LESSONS LEARNED	CORRECTIVE ACTION
The SCE crew closed out the network protector inspection with no actions taken and did not return to complete the work request.	Conduct an All Hands meeting with Distribution Apparatus Crew members to review lessons learned of the Long Beach outage events specifically addressing not closing out equipment inspections with no actions taken, documenting deficiencies in SAP, and notifying Distribution Apparatus supervision of inaccessibility to underground structures and rescheduling the equipment inspection.
There was a lack of consistent, updated mapping and no formal mapping process for network map corrections of the Long Beach secondary network.	Update Long Beach Downtown secondary network map with the results of the Network Protector detailed inspections, Long Beach secondary network underground structure inspections, and repairs made from both July 15th and July 30th events. Improve the process for all mapping updates for Long Beach secondary network to ensure they are submitted through Western Mapping Office at Lighthipe.
There was limited automation and remote monitoring capability of network protector's status within the Long Beach secondary network.	Install radio, antennas, and monitoring equipment on all Long Beach Network Protectors. Develop and implement an Outage Management System (OMS) graphic interface to monitor secondary load on secondary networks.
After removal of asbestos fire/arc proofing insulation, alternative methods for insulating primary circuit cables were not sought.	Install fire protection wrap on cable splices.
A model of the Long Beach secondary network did not exist.	Create a computerized model of the secondary network for normal operation and contingencies.
There was a lack of adequate knowledge of the vulnerabilities and operational importance of the network protectors, NP relays, and secondary network system. This lack of knowledge resulted in network protectors being placed in service that were not able to perform their intended function due to missing NP relays.	Instruct SCE crews on the installation and maintenance procedures for addressing network protectors including periodic refresher training.
There was no standard design configuration of primary circuitry for the Long Beach secondary network, which included a combination of radial system and secondary network.	Develop and implement design configuration and planning criteria for secondary network distribution system. This includes configuration of primary circuitry, and loading criteria.
There were insufficient work processes and organizational structure to support continuous operation of the Long Beach secondary network,	Develop a specific organizational structure that is dedicated to the Long Beach secondary network. Become a participating member of a utility industry network forum such as at the Electric Power Research Institute to obtain lessons learned and best practices for secondary network

	design, construction, and maintenance. Initiate changes and corrective actions as identified.
The work management process was not adequately established to ensure that NP relays were ordered, tracked, and installed prior to placing a network protector in service. This includes an inadequate process established for capturing missing NP relays.	Develop a work management process to ensure proper handling of network protectors and associated relays. Establish a process to ensure all newly installed Network Protectors without the necessary components are physically tagged as "Out of Service" and a Notification that will prioritize the installation of a NP relay and/or other components is generated.

(END OF ATTACHMENT A)

EXHIBIT 5



Electric & Telecommunication Penalties Assessed by SED in Last 10 Years

February 2019

Entity	Penalties (M = Million)	Total (M = Million)
SDG&E	• $14.75 M combined for the Witch, Rice and Guejito fires.	$14.75 M
SCE	• $37 M for the Malibu Fire ($20 M to General fund) • $16.5 M for the 2011 San Bernardino incident ($10 million general fund) • $8 M for 2011 Windstorm ($5 million general fund) • $2.01 M for the 2013 Huntington Beach incident • $15 M for the Long Beach incident ($4 million general fund) • $50,000 for the 2016 Whittier incident/fatality • $8 M for the Twentynine Palms incident	$86.56 M
PG&E	• $5,569, 313 Kern Power Plant fatality ($2.3 million general fund) • $450,000 citation for 2014 San Jose incident • $50,000 citation for Metcalf 2014 incident • $300,000 citation for violating reporting requirement- Butte fire • $8,000,000 citation for Butte Fire • $400,000 citation for the 2015 Moss Landing incident	$14.8 M
Cox Comm.	• $2 M for the 2007 Guejito fire	$2.0 M
AT&T	• $4 M for the 2007 Malibu fire ($2.3 M to General fund)	$4 M
Sprint	• $4 M for the 2007 Malibu fire ($2.3 M to General fund)	$4 M
Verizon	• $4 M for the 2007 Malibu fire ($2.3 M to General fund)	$4 M
NextG (Crown Castle)	• $14.5 M for the 2007 Malibu fire (8.5 M to General fund)	$14.5 M
	TOTAL	**$144.61 M**