SCE Fire Management

SOUTHERN CALIFORNIA
EDISON
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Scott Brown

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SCE Fire Response Priorities

1. **Firefighter, Public, & Employee Safety**
2. Grid Stability (Transmission)
3. Electric Infrastructure Protection
4. Damage Assessment
5. Restoration
6. Repopulation

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SAFETY ALERT

Power Line Hazards On Wildland Fires

- ***Look Out*** for **power lines** in, and around, the fire area**.**
  - Treat all downed wires as if energized. Downed wires can energize fences, equipment, phone lines, cable lines, and anything else conductive.
- ***Communicate*** with your personnel, the location of power lines that are, or may be involved in the incident.
  - Contact Edison to report electrical facilities that are involved or damaged, with a location for crews to respond.
- ***Escape Routes*** **– DO NOT** identify escape routes that would take personnel under or near power lines!
  - Heat from extreme fire activity ionizes the air. Superheated, ionized air can act as a conductor, causing a line to arc to directly to ground.
  - Smoke, fire retardant, foam, or water can contaminate insulators, causing a power line to arc across insulators, through poles or towers to ground.
- ***Safety Zones*** **– DO NOT** identify safety zones under or near power lines!
  - In addition to the arcing potential described for escape routes, "Fire Shelter" material is conductive and may attract an arc if a power line faults to ground due to direct, or near direct flame impingement.
  - Do not locate the ICP, or park equipment under power lines.
- ***Extinguish pole fires when discovered.*** This will help prevent "wire down" hazards that may block escape routes, equipment, or pose a hidden danger during mop up operations.
  - *Avoid applying water, foam, or gel above the first level of communication cables. If necessary, only use a water fog pattern on pole-top equipment.*
- ***Air Operations*** - Be aware of all power lines in and around the fire area, including skylines that run along the tops of transmission towers. Skylines are single, grounded, ¼" steel wires that are very easy to overlook in contrast to the larger conductors on the same tower.

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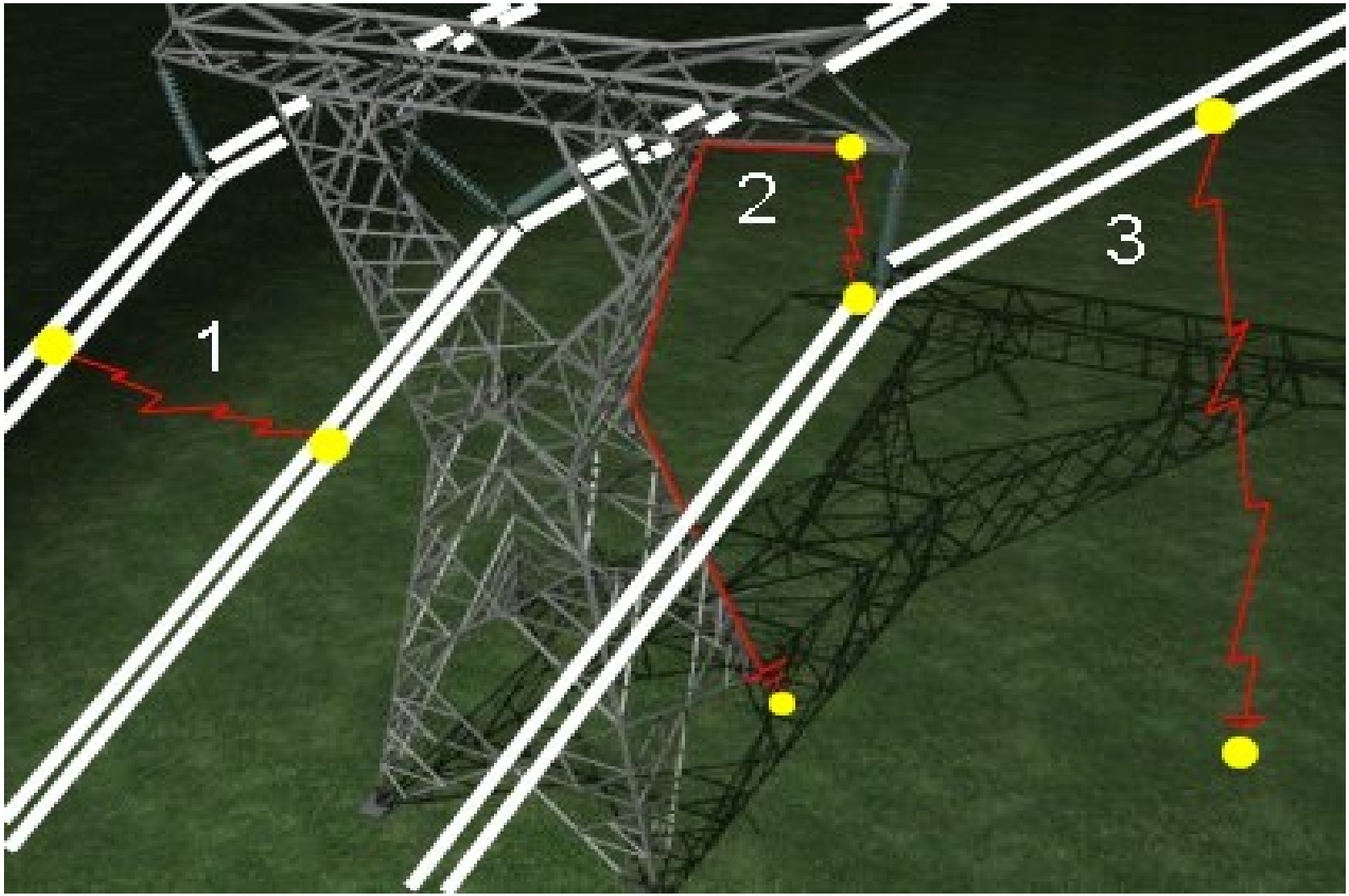
Electrical Transmission Lines and Towers

- Heat from the fire ionizes the air above the flames, creating a conductor to ground, or across conductors.
- When extreme heat is present, you can expect high voltage lines to arc to the ground. With up to a 500,000 volts in some transmission lines, you will see an arc similar to a lightning strike.
- The minimum safe distance to powerlines involved in a wildland fire is 1 ½ times the height of the pole or tower.
- Please be careful where you park equipment, or have crews work when extreme fire conditions are present.

2004 Foothill Fire LAC

Types of Faults

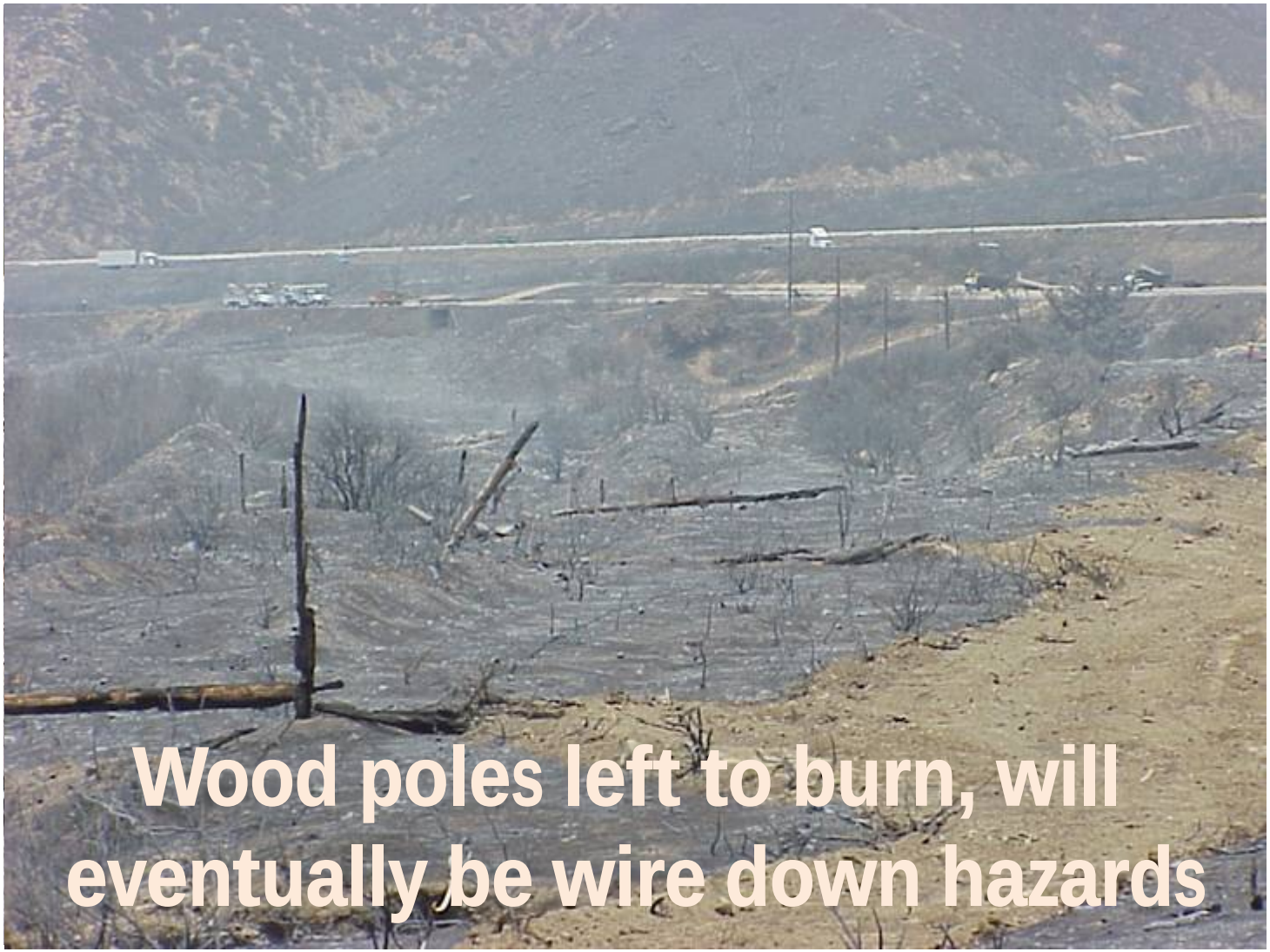


Phase-to-Phase Fault

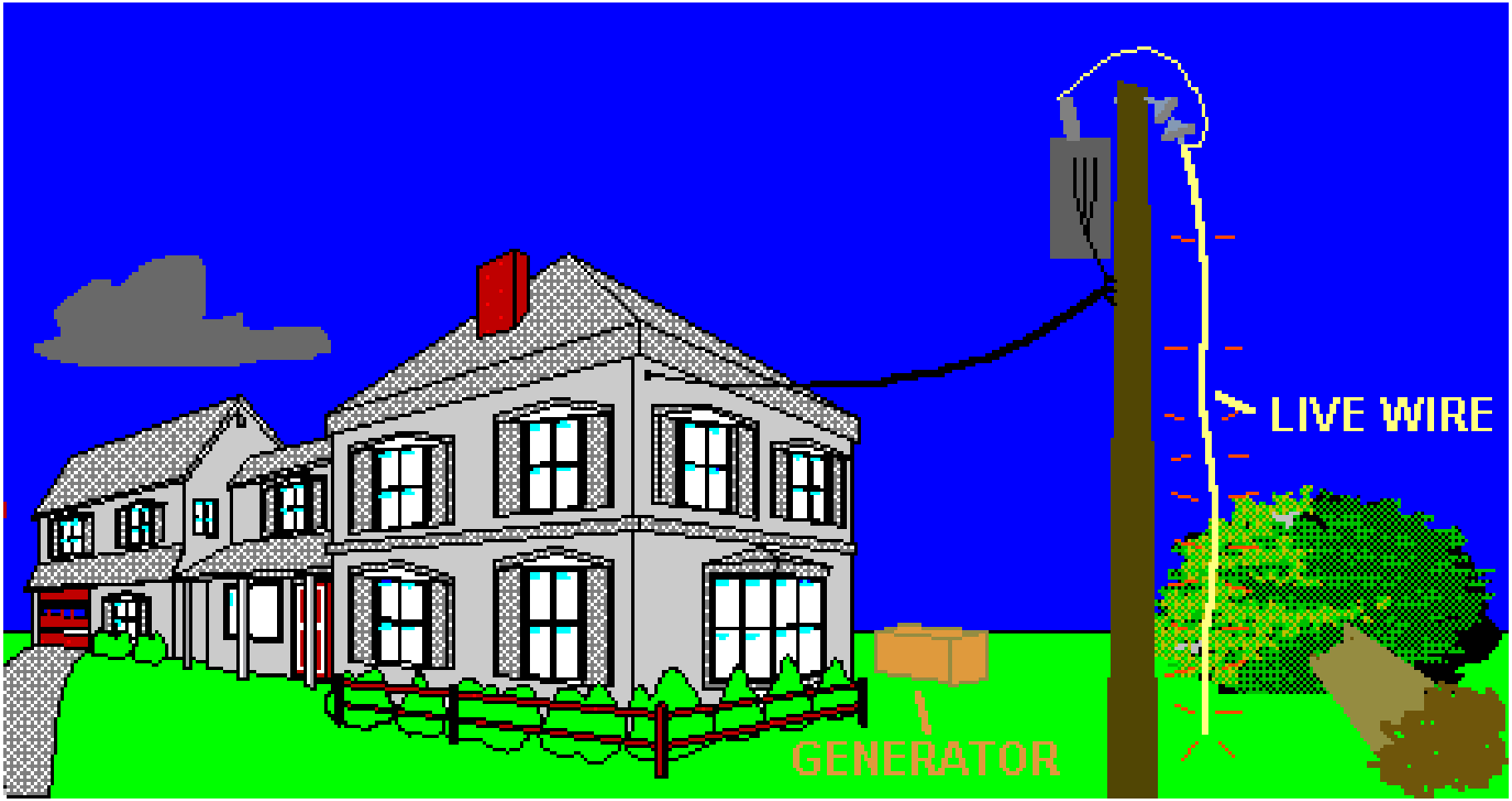
Time to Clear Faults on a Line

- The time to clear a faulted power line depends on three main factors.
  - The time it takes the relay to sense the fault,
  - The time required to communicate fault conditions at each end of the protected line on telecommunication circuits ("propagation delays")
  - The time it takes circuit breakers to operate on a "trip" command
- The typical fault clearing cycle on 500 kV AC transmission lines is 3 cycles, or approximately 50 milliseconds (0.05 seconds). This time is allocated as follows:
  - Relay operation - 1/2 cycle
  - Communication delay - 1/2 cycle (or less)
  - Breaker operation - 2 cycles

Extinguish Pole Fires When Possible



Backfeed



Aircraft Operations

Aircraft

- Powerlines on towers can be deceiving…
  - At the top of each tower is a single steel static line that provides structural support and lightning protection.
  - This “skyline” can be difficult to see in long spans.

2 - Skylines

Skylines can be difficult to see

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Thank you