

*Southern California Edison*  
*R.18-10-007 – SB 901*

**DATA REQUEST SET T U R N - S C E - 0 0 4**

**To: TURN**  
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**Job Title: Senior Manager**  
**Received Date: 3/1/2019**

**Response Date: 3/6/2019**

**Question 02:** Re. WMP p. 26, RAMP Control C2:

- a. Does footnote 35 mean that SCE will replace existing transformers only if they are “failing”? If yes, please explain how SCE determines if a transformer is failing.
- b. Have there been any ignitions associated with the operation of existing mineral oil transformers? If yes, please quantify. Please explain whether the ignition was related to the mineral oil or fluid.
- c. Please quantify the number of existing mineral oil transformers disaggregated by Tier-1, Tier-2 and non-HFTD.
- d. Please quantify the number of existing ester fluid transformers disaggregated by Tier-1, Tier-2 and non-HFTD.
- e. How many transformers does SCE forecast will be replaced in 2019 and 2020?

**Response to Question 02:**

- a. SCE replaces existing transformers under a number of conditions which includes when a transformer is demonstrating signs of degradation potentially leading to failure. SCE uses visual inspections of transformers to identify degraded parts that may lead to reduced service life and failure such as oil leaks, tank corrosion, overheated terminals, and damaged bushings. SCE has had success using smart meter voltage readings for transformers to identify failing transformers where internal winding shorts can be detected, and the transformer may be replaced prior to a faulted condition developing due to the transformer. Severely overloaded transformers cause degradation of the insulating oil, paper, and other components of transformers. SCE has established loading limits for transformer replacements where prolonged operation may lead to reduced service life and premature transformer failure. SCE may also replace installed transformers as maintenance opportunities to allow for bundling work activities to take advantage of work execution efficiencies, such a replacement of transformers during a pole replacement where limited additional work is needed for updating the installation.
- b. There have been three transformer-related fires where the transformer contained mineral oil. However, SCE could not determine if they were associated with mineral oil or some other cause.
- c. SCE’s existing inventory of in-service mineral oil transformers is as follows:

|                          | Tier 3 | Tier 2 | Non-HFRA |
|--------------------------|--------|--------|----------|
| Mineral Oil Transformers | 45,507 | 25,813 | 357,214  |

The above counts are based on a system query ran on 3/4/19. SCE expects these numbers to decrease by a few thousand over the next few months as 2018 work orders continue to be completed in the system reflecting replacements of some of the above units with ester oil units.

- d. SCE's existing inventory of in-service ester oil transformers is as follows:

|                        | Tier 3 | Tier 2 | Non-HFRA |
|------------------------|--------|--------|----------|
| Ester Oil Transformers | 645    | 242    | 2,361    |

The above counts are based on a system query ran on 3/4/19. SCE expects these numbers to increase by a few thousand over the next few months as 2018 work orders continue to be completed in the system.

- e. Prior to 2019, SCE has replaced roughly 5,000 overhead transformers annually in HFRA. Including the Wildfire Covered Conductor Program efforts, SCE expects to replace roughly 5,600 overhead transformers for circuits in HFRA. SCE HFRA locations include CPUC Tier 2, Tier 3, a small buffer, and non-CPUC HFRA as detailed in Section 3.4.1 of SCE's 2019 Wildfire Mitigation Plan. 2020 wildfire mitigation activities, including those associated with WCCP, will be considered in the 2020 WMP proceeding, and are not within the scope of this proceeding. For 2020, SCE has not yet decided upon a final scope of grid-hardening work including the overhead transformers; however, we anticipate replacing roughly 5,600 transformers.