As illustrated in workpapers to Schedule 10 and 16, during the period January 2014 through December 2015, SCE forecasts:

- $439 million in ISO-related non-incentive network transmission expenditures (including $153 million in ISO Blanket expenditures),
- $1.023 billion FERC incentive rate qualified CWIP expenditures, and
- $1.274 billion of FERC direct capital expenditures projected to go into rate base during the upcoming Rate Year (in the period January 2015 through December 2015)

In addition to the numerous but relatively small transmission projects, there are fourteen (14) significant transmission projects (each $5 million or greater in ISO-related costs) that are projected to go into rate base during the upcoming Rate Year – five Blankets (items 1 through 5 below), six non-incentive projects (items 6 through 11), and three incentive projects (items 12 and 14). Table 1 below provides a summary of forecast FERC-jurisdictional direct capital expenditures for fourteen significant transmission projects that are projected to go into rate base in the period January 2015 through December 2015.

Table 1
FERC Direct Capital Expenditures Projected to Go into Rate Base during Rate Year[1]
($millions)

No.	PIN	Project	FERC CWIP	FERC Non-CWIP	Total
1	4343	Substation Relay Replacement Program	0	8.160	8.160
2	5210	Substation Transformer Bank Replacement Program (AA- & A-Bank)	0	18.301	18.301
3	6428	Centralized Remedial Action Scheme (C-RAS)	0	12.933	12.933
4	7298	Transmission Line Rating Remediation	0	33.081	33.081
5	3363	Control Room Upgrades	0	14.349	14.349
6	6263	Vestal: Equip 230kV circuit breakers (CBs)	0	5.905	5.905
7	6791	Lugo 500kV Substation Breaker Installation	0	8.567	8.567
8	7248	Eldorado 500kV switchyard	0	91.415	91.415
9	7241	Eldorado 500kV Breaker Installation	0	11.519	11.519
10	7426	New Primm 220kV Substation	0	22.681	22.681
11	7116	Villa Park: 230kV CBs	0	6.355	6.355
12	6438	TRTP Segment 7	191.555	0	191.555
13	6439	TRTP Segment 8	510.460	0	510.460
14	6442	TRTP Segment 11	241.794	0	241.794
15	Various	Less than $5m each [2]	48.827	48.400	97.227
		Total	**992.636**	**281.666**	**1,274.302**

[1] For calculation, see: "WP-Schedule 16-Summary of ISO Capital Expenditures - Non-Incentive Projects" for PINs 4343, 5210, 6428, 7298, 3363, 6263, 6791, 7248, 7241, 7426 and 7116; "WP-Schedule 10-Summary of ISO Capital Expenditures – Incentive Projects" for TRTP Segments 7, 8 & 11.
[2] Also includes capital expenditures going into rate base for PINs whose operating dates are prior to 2015

1. Substation Relay Replacement Program (PIN: 4343)

Relays are devices that monitor the currents and voltages for each piece of equipment in substations and actuate circuit breakers should these parameters exceed acceptable limits. Relays in 500 kV and 220 kV substations fall under FERC jurisdiction.

SCE has a specific plan for replacing both its distribution protection and control equipment and its 500 kV and 220 kV relays. The forecast includes replacement of obsolete protection and control systems, replacement of first-generation integrated systems (relays and control computers), replacement of obsolete PLCs, and replacement of 500kV and 220kV relays. The estimated ISO-related direct capital expenditures for this program that are expected to be operational in the period January through December 2015 are $8.2 million.

2. Substation Transformer Bank Replacement Program (AA- & A-Bank) (PIN: 5210)

AA-Bank transformers are located in major substations where they take electricity at the 500kV transmission level and transform it down to 220kv. The Substation Infrastructure Replacement ("SIR") program identifies and replaces AA-Bank transformers that are approaching the end of their service lives, that contain parts which are known to be seriously problematic or are no longer available, or that can no longer be cost effectively maintained. The costs of AA-Bank transformer replacement are all under FERC jurisdiction.

A-Bank transformers are located in major substations where they take electricity at the 220kV transmission level and transform it down to a subtransmission voltage, either 115kV or 66kv. The SIR program identifies and replaces A-Bank transformers those are approaching the end of their service lives, that contain parts which are known to be seriously problematic or are no longer available, or that can no longer be cost-effectively maintained.

The consequences of an in-service failure of an A-Bank transformer are highly undesirable. A-Bank transformers typically supply power to large portions of SCE's distribution system servicing hundreds of thousands of customers. While redundancy is built into the A-Bank system, an in-service failure would place the system into an "N-1" condition, wherein a second failure or system disturbance could result in a massive blackout affecting significantly large areas. So severe are the consequences of such a blackout that SCE believes that every reasonable precaution must be taken to prevent it.

Although infrequent, in-service failures of A-Bank transformers can be violent. These transformers are oil-filled and catastrophic failures and ensuing fires can endanger the safety of SCE employees and the operability of nearby equipment. Inspections are extremely helpful in identifying many incipient failures. However, because of the speed at which failure mechanisms can arise and progress, inspections cannot prevent all failures. Therefore, planned preemptive replacements under controlled conditions of transformers clearly approaching the end of their service lives are a prudent and responsible action to minimize the risk of in-service failures.

In summary, the replacement of AA- and A-Bank transformers is managed by the Substation Infrastructure Replacement program which combines engineering analysis and expert judgment to ensure that the appropriate number of AA- and A-Bank transformers is replaced each year and that those which are replaced are the most risk-significant.

In 2014 - 2015, the 3AA and 4AA-Bank replacements at Eldorado substation are under FERC jurisdiction. In 2014, the 1A-Bank replacement at Kramer substation is under FERC jurisdiction while all remaining A-Bank replacements are under CPUC jurisdiction in 2014 - 2015. The estimated ISO-related direct capital expenditures for this program that are expected to be operational in the period January through December 2015 are $18.3 million.

3. Centralized Remedial Action Scheme (C-RAS) Program Phase (PIN: 6428)

After the CRAS Project Phase is completed, the CRAS Program Phase will implement new RAS using the CRAS system. These new RAS will allow for new generation interconnections, new or modified reliability based RAS, and conversion of existing RAS as required.

This project phase encompasses planning and designing new RAS, as well as procuring the relay and telecommunication equipment necessary to implement new RAS using CRAS, and to convert exiting RAS to the CRAS platform. The planning and engineering of these activities require a relatively long lead time. Therefore, before the end of the Project Phase, SCE will start planning and engineering the first new RAS that will be incorporated with CRAS. This will allow SCE to more quickly install the first CRAS protection schemes upon completion of the Project Phase.
SCE's cost forecast reflects this strategy. SCE will complete or partially complete deployment of nine additional RAS by 2017. The estimated ISO-related direct capital expenditures for this program that are expected to be operational in the period January through December 2015 are $12.9 million.

4. **Transmission Line Rating Remediation (PIN: 7298)**

SCE is beginning line remediation efforts based on the results of the Transmission Line Rating Remediation ("TLRR") Study. These efforts are expected to be ongoing through at least 2028. Remediation work includes replacing towers and poles, clearing brush, replacing insulators, removing slack from lines, and other efforts to remediate line clearance issues.

The forecast of TLRR capital expenditures is based on a specific, project-based forecast. The forecast includes the costs for remediation activities, engineering and design work, and materials, by year and by priority level of the work. Most of these costs are FERC jurisdictional. The estimated ISO-related direct capital expenditures for this program that are expected to be operational in the period January through December 2015 are $33.1 million.

5. Control Room Upgrades (PIN: 3363)

Over the past several years, many switching centers have been impacted as a result of automation and relay scheme installations that have led to encroachment in Grid Operation's personnel space. Load growth increases combined with reductions of switching centers in the SCE service territory over time created a consolidation of personnel without adequately addressing the remaining facilities space requirements. The result has hampered the switching center's ability to monitor and control the power grid using aging consoles and technology with adequate situational awareness. Additionally, none of these buildings were designed to accommodate NERC CIP Physical Security Perimeter compliance requirements.

Of the 13 switching centers currently in operation, several are in need of complete replacement. The need for replacement is mainly driven by age of the existing structures, system growth, and the need to upgrade the technology currently available in control room design. In addition, there is a need to be compliant with standards associated with the Americans with Disability Act.

Four control buildings have been identified for complete replacement and eight have been identified for remodel. New control buildings at Devers, Valley and Vista have 75% spend in 2014 and 25% spend in 2015. New control building at Lugo has 50% spend in 2014 and 50% in 2015. The proposed operating dates are December 2014 for Control Buildings and December 2015 for Energy Management System (EMS) control installation with estimated ISO-related direct capital expenditures of $14.3 million.

6. Vestal 230/66kV Substation (PIN: 6263)

Vestal 220/66 kV Substation is located in Richgrove and serves communities in Tulare County. By 2015, Vestal 220/66 kV Substation is projected to exceed its capacity limit due to continuing load growth in the area. The project scope is to replace two existing 100 MVA transformer banks with two 280 MVA transformer banks (thereby increasing total transformer capacity from 200 to 560 MVA). Currently, both of the existing 100 MVA A-bank transformers at Vestal 220/66 kV Substation are connected directly to the Vestal 220 kV switchrack without circuit breakers. The project scope includes installing four new 220 kV circuit breakers at Vestal 220/66 kV Substation to connect each of these two A-bank transformers to the Vestal 220 kV switchrack in double-breaker positions. Without the project, the loading at Vestal 220/66 kV Substation is projected to reach 127.8 percent of the substation's capacity limit by 2015 under N-1 transformer outage conditions. The operating date is June 2015 with estimated ISO-related direct capital expenditures of $5.9 million.

7. Lugo 500kV Substation Breaker Installation (PIN: 6791)

Currently, both No. 1AA and No. 2AA 500/230 kV transformer banks at Lugo substation are connected to the North and South Buses (respectively) via a bank-on-bus configuration. This configuration violates SCE's existing Transmission Planning Criteria. The project will improve operational flexibility, simplify future additions, and minimizes the loss of station capacity during planned outages. The proposed operating date is December 2015 with estimated ISO-related direct capital expenditures of $8.6 million.

8. Eldorado 500kV switchyard (PIN: 7248)

As part of the Transition Cluster Phase II, three projects were requesting interconnection to SCE's East of Pisgah Sub-Area. Studies performed determined that the existing system is insufficient to accommodate these three projects and that the addition of these projects adversely impact neighboring facilities. To reliably interconnect and integrate these generation resources in a manner that also addresses impacts to neighboring utilities; the Phase II Studies identified the need for a new SCE-owned Eldorado 220 kV Switchrack which is not connected to the existing 220 kV switchrack. The new rack would be connected directly to the 500 kV bus with a single AA-bank and implementing base case congestion management (curtailment of resources). The proposed operating date is December 2015 with estimated ISO-related direct capital expenditures of $91.4 million.

9. Eldorado 500kV Breaker Installation (PIN: 7241)

Currently, both No. 3AA and No. 4AA 500/230 kV transformer banks at Eldorado Substation are connected to the South and North Buses (respectively) via a bank-on-bus configuration. This configuration violates SCE's existing Transmission Planning Criteria. The project adds the following benefits: improved operational flexibility; simplifies future additions; minimizes the loss of station capacity during planned outages; and improved selectivity of protection schemes. The proposed operating date is December 2015 with estimated ISO-related direct capital expenditures of $11.5 million.

10. New Primm 220 kV Substation (PIN: 7426)

A new 220 kV collector substation (Primm) is needed to interconnect new renewable generation projects in Primm, Nevada. This project will provide the transmission infrastructure needed to interconnect solar generation along the Eldorado-Ivanpah 220 kV transmission corridor. The project consists of constructing a new 220 kV substation (switching station). The existing Eldorado-Ivanpah No. 1 220 kV line will be connected into and out of ("looped into") the new Primm Substation to form the Eldorado-Primm and Ivanpah-Primm 220 kV transmission lines. Also, a single 220 kV generation tie line will be interconnected to the new substation. The telecommunications scope of work to support the new substation and transmission lines includes the installation of fiber optic cable between Ivanpah and Primm Substation to meet the diverse routing requirements for the Ivanpah-Primm 220 kV transmission line. All required light-wave channel and related terminal equipment at Primm, Eldorado, and Ivanpah Substation will be installed to support the new fiber optic lines. The operating date is October 2015, with total ISO related direct capital expenditures of $22.7 million.

11. Villa Park 230kV CB (PIN: 7116)

In order to ensure compliance with current planning criteria and guidelines and higher operation flexibility, update the existing 2A Villa Park 230/66 kV Substation bank-on-bus configuration to bank-on-breaker configuration by equipping 220 kV bank position No. 4 with double breakers. In addition, relocate the existing No. 1A Bank currently connected at 220 kV position No. 2N to 220 kV

Position No. 3N and equip position No. 3 with double breakers. The proposed operating date is December 2015 with estimated ISO-related direct capital expenditures of $6.3 million.

12. TRTP Segment 7 (PIN: 6438)

Segment 7 of the Vincent-Mira Loma 500 kV transmission line section between Vincent and the Mesa area will be completed by replacing the Vincent-Rio Hondo No.2 220 kV transmission line with 500 kV construction, and upgrading existing transmission near Vincent and between the city of Duarte and the Mesa area. The upgrades near Vincent involve removing five miles of the Vincent-Rio Hondo No.2 220 kV single circuit transmission line between Vincent and the Angeles National Forest and replacing it with a new five mile 500 kV single circuit transmission line. The upgrades between the city of Duarte and the Mesa area involve removal of the remaining section of existing Antelope-Mesa 220 kV and replacing it with approximately 15 miles of new double-circuit 500 kV transmission line section. In addition, in order to maximize the use of the existing transmission right-of-way, several 66 kV subtransmission lines between the Rio Hondo and Mesa areas need to be relocated to either new right-of-way or SCE franchise. During the Rate Year, New Vincent-Rio Hondo No.2 500 kV transmission line is projected to be in service with estimated ISO-related direct capital expenditures of $191.5 million.

13. TRTP Segment 8 (PIN: 6439)

Segment 8, the remaining portion of Vincent-Mira Loma 500 kV transmission line between the Mesa area and Mira Loma, will be double-circuit 500 kV mostly located in existing SCE transmission line right-of-way. In order to utilize the existing right-of-way, 220 kV transmission consolidations will be required. These consolidations include the removal of an existing 220 kV “idled” transmission line segment, the removal of an existing 220 kV single-circuit line and replacement with new 220 kV double-circuit line, and the relocation of several 66 kV subtransmission lines in the Chino area. SCE plans to install fiber optic cables as part of Segment 8. This is necessary to replace the fiber optic cables to be removed with the Mesa-Chino 220 kV transmission line. SCE will also install associated equipment at various locations including a new communications room at the Mira Loma substation. The operating date for Segment 8 is May 2015 with estimated ISO-related direct capital expenditures of $510.4 million.

14. TRTP Segment 11(PIN: 6442)

Segment 11's scope includes rebuilding approximately 18.7 miles of existing 220-kV transmission line to 500-kV standards between the existing Vincent and Gould Substations. This segment would also include the addition of a new 220-kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV transmission line, between the existing Gould Substation and the existing Mesa Substation (Segment 11). The operating date for Segment 11 is May 2015 with estimated ISO-related direct capital expenditures of $241.7 million.

For further details, please see the following workpapers: "WP-Schedule 10-Summary of ISO Capital Expenditures - Incentive Projects", "WP-Schedule 16-Summary of ISO Capital Expenditures - Non-Incentive Projects", and "WP-Schedule 10 & 16."