

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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Application of Southern California Edison
Company (U 338-E) For Authority To, Among
Other Things, Increase Its Authorized Revenues
For Electric Service In 2012, And to Reflect That
Increase In Rates.

Rulemaking A. 10-11-015
(Filed November 23, 2010)

OPENING BRIEF OF SIERRA CLUB

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I. INTRODUCTION

In this proceeding, Southern California Edison (“SCE”) seeks Commission approval for certain past, current and future capital investments in the Four Corners Power Plant (“Four Corners”) totaling \$138.475 million. SCE describes these investments in Exhibit SCE-02, Vol. 06 (Parts 2 and 3) of its direct testimony. These investments are governed by the Commission’s Emissions Performance Standard (“EPS”), which prohibits capital investment that extends the life or increases the capacity of a coal-fired power plant. As explained below, many of SCE’s investments do both. For the remaining investments, SCE fails to provide sufficient evidence showing no life-extension or capacity increase. Although the Commission has granted SCE a limited exemption from the EPS for investments are that necessary to sustain basic operation until 2016, when SCE’s contractual term ends, SCE further fails to show why its investments are necessary for basic operation until 2016. For these reasons, Sierra Club urges the Commission to reject SCE’s attempt to make capital investments in Four Corners that not only represent a massive “repowering” project, but will extend the life and/or increase the capacity of this power plant, thus increasing the pollution and greenhouse gas emissions from one of the nation’s largest polluters for many years to come.

II. BACKGROUND

A. The Existing Pollution Load from Four Corners

With five units carrying more than two thousand megawatts of generating capacity, Four Corners is one of the largest and dirtiest coal-fired power plants in the country. According to the EPA, last year, the plant emitted over 38,000 tons of nitrogen oxide (“NO_x”) pollution, over 11,000 tons of sulfur dioxide pollution (“SO₂”), and over 14 million tons of carbon dioxide. The plant also emits significant amounts of particulate matter (“PM”), and mercury, an established neuro-toxin.

With respect to nitrogen oxide, which also includes the pollutant nitrogen dioxide (“NO₂”), Four Corner’s emissions are higher than any other U.S. coal plant. Current scientific evidence links short-term exposures with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma.¹ These studies also show a connection between breathing elevated short-term NO₂ concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma.² EPA reports similar health-related impacts from human exposure to SO₂.³

PM, and especially fine particles, “contain microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems.”⁴ Furthermore “numerous scientific studies have linked particle pollution exposure to a variety of problems, including: increased respiratory symptoms; decreased lung function; aggravated asthma;

¹ <http://www.epa.gov/air/nitrogenoxides/health.html>

² *Id.*

³ <http://www.epa.gov/air/sulfurdioxide/health.html>

⁴ <http://www.epa.gov/air/particlepollution/health.html>

development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease.”⁵

Mercury from power plants also carries human health concerns, especially for the very young. A 2006 study concluded that methylmercury emitted by American power plants “is associated with clinically significant mental retardation in hundreds of American babies born each year, and that this excess burden of mental retardation exacts a significant economic cost to American society, a cost that amounts to at least hundreds of million dollars each year.”⁶

Four Corners also happens to be located in Shiprock, New Mexico, which is within the Navajo Nation. Although the plant provides power to many states, including California, the plant’s pollution disproportionately affects the Navajo people. A 2010 research article identified a cluster of 37 Navajo communities that rank high for most of the diseases/conditions west of Shiprock based on local hospital records.⁷ Among these 37 communities, the town of Shiprock ranked in the top ten for all seven of the reported diseases and/or conditions. More specifically, of all 37 communities, Shiprock ranked second for asthma, third for coughing and wheezing, sixth for pneumonia, seventh for upper respiratory tract infection, eighth for bronchitis, and ninth for chronic obstructive pulmonary disease. The study further reported that Red Valley, which is situated west-southwest of Shiprock, ranked first for five of the seven diseases/conditions. Although Red Valley is not in the San Juan River Valley, it is lower in elevation than Shiprock. The study reports that according to anecdotal evidence, power plant emission plumes often flow locally in that direction, especially during thermal atmospheric inversions.

⁵ *Id.*

⁶ Trasande, L. and Schecter, C. et al., *Mental Retardation and Prenatal Methylmercury Toxicity*, American Journal of Industrial Medicine 49:153–158 (2006), p. 156

⁷ Bunnel, J., Garcia, L., et al. *Navajo Coal Combustion and Respiratory Health Near Shiprock, New Mexico*, The Journal of Environmental and Public Health (2010), p. 12.

The potential impact of Four Corner’s pollution on the surrounding community is particularly troubling given the high levels of poverty and the relative lack of access to health care services for this population. As concluded by a 2004 report on the subject by the U.S. Commission on Civil Rights, “our nation’s lengthy history of failing to keep its promises to Native Americans includes the failure of Congress to provide the resources necessary to create and maintain an effective health care system for Native Americans.”⁸

The power plant’s pollution not only raises public health concerns, but also adversely impacts visibility in our nation’s national parks and wilderness areas. In fact, the EPA identified 16 such pristine or “Class I” areas, including Grand Canyon National Park and Arches National Park, that are affected by Four Corner’s pollution load. 75 Fed.Reg.64221 at 64229-30.

B. The Commission’s EPS for Four Corners

The Commission’s review of SCE’s request to make capital investments in Four Corners is governed by the Public Utilities Code (“Code”) and by the Commission’s Emissions Performance Standard (“EPS”). The Code states that “[t]he commission shall not approve a long-term financial commitment by an electrical corporation unless any baseload generation supplied under the long-term financial commitment complies with the greenhouse gases emission performance standard established by the commission pursuant to subdivision (d).” Code § 8341(b)(1). The Code defines a “long-term financial commitment” as “either a new ownership investment in baseload generation or a new or renewed contract with a term of five or more years, which includes procurement of baseload generation.” Id. at § 8340(j).

The EPS similarly prohibits approval of “new ownership investment” in high greenhouse gas (“GHG”) emitting facilities such as coal-fired power plants. The EPS defines new ownership investment as an investment that “is intended to extend the life of one or more units of

⁸ <http://www.usccr.gov/pubs/nahealth/nabroken.pdf>

an existing baseload powerplant for five years or more, or results in a new increase in the existing rated capacity of the powerplant.” D.07-01-039 at 5. The purpose of restricting major investment in high greenhouse gas (“GHG”) emitting facilities is to prevent “new long-term financial commitments to electrical generating resources that will have major impacts on GHG emissions for many years to come.” D.07-01-039 at 35.

The Commission has tailored the EPS for Four Corners. Significantly, the Four Corners-specific ruling prohibits ratepayer compensation for any capital investment in the facility after January 1, 2012. Decision 10-10-016, dated October 14, 2010 at 19, 27-28. For pre-2012 capital investments, the ruling creates a limited exemption that allows the Commission to consider two categories of investments; those that fall below one million dollars and those that are above one million dollars. *Id.* at 29. Specifically, for discrete investments of less than \$1 million, SCE must make a reasonableness showing for purposes of rate recovery. *Id.* For capital expenditures of \$1 million or more, SCE’s reasonableness showing also should establish necessity. *Id.* According to the Four Corners-specific EPS, this necessity showing should identify whether the expenditure likely will extend the life of Units 4 or 5 beyond five years, ten years, or some additional five-year increment. *Id.* And, if life extension by one or more five-year increments is likely, the showing should explain the precise nature and purpose of physical modification(s) and why the expenditure is, nonetheless, necessary, given the impact on life extension. *Id.*

Furthermore, under the Four Corners-tailored EPS, SCE’s necessity showing should examine four factors: (1) whether the investment is necessary to prevent the risk of an imminent safety hazard or comply with state or federal environmental standards; (2) whether the investment is necessary to continue basic operation of Unit 4 or Unit 5 within the period of SCE’s existing contractual obligations; (3) whether, in considering the cost and benefits and the

prohibition on long-term investment at Four Corners, the investment is necessary within the period of SCE's existing contractual obligations and; (4) the cumulative impact of all Four Corners capital expenditures for which SCE seeks recovery in its 2012 GRC. *Id.* Notably, as ordered by the Commission, in making the requisite showings on reasonableness and necessity, "Southern California Edison Company must...fully explain the bases for its positions." *Id.* at 30.

III. ARGUMENT

A. SCE Has Not Met the Standard of Review for Its Proposed Capital Investments

As explained below, SCE has failed to meet its burden to show that these proposed investments will not extend the life of the facility and/or increase its capacity. It has also failed to show why these investments are needed to continue basic operation of the power plant until 2016 (the end of SCE's contractual commitment to the co-owners of Four Corners).

1. SCE Carries the Burden of Proof for Its Proposed Investments

There is no dispute that SCE carries the burden of proving that its proposed investments do not extend the life or increase the capacity of the power plant. Decision 10-10-016 at 28-29; also see, ALJ Darling's November 23, 2010 Scoping Ruling at App. A, p.1 ("Applicant has the burden of proof.") If the investments raise the specter of life extension, the company carries the additional burden of showing, among other things, that the proposed investments are necessary for basic operation of the facility until 2016, when its contractual commitment to Four Corners expires. *Id.* at 29.

As explained below, SCE has not met its burden of proof to show that its investments will not extend the life or increase the capacity of Four Corners. To the contrary, SCE provides evidence showing that its investments do both. SCE has further failed to explain the necessity of its proposed investments. More specifically it has not provided sufficient evidence to show that

its investments are necessary to prevent the risk of an imminent safety hazard or comply with state or federal environmental standards or that its investments are necessary to continue basic operation of Unit 4 or Unit 5 within the period of SCE's existing contractual obligations. The record is also devoid of evidence discussing the cumulative impact of all Four Corners capital expenditures for which SCE seeks recovery in its 2012 GRC. *Id.* As a result SCE has failed to satisfy the Commission's mandate that "Southern California Edison Company must...fully explain the bases for its positions." R.06-04-009, dated October 14, 2010.

2. SCE Has Not Met Its Burden of Proof on Life Extension

SCE asks the Commission to rely on nothing more than the company's "belief" that its capital investments are not life-extending.⁹ Without providing any objective evidence, SCE first defines the "life" of Four Corners as ending in 2016. To support this definition of "life," the company relies on its contractual commitment to the facility, which provides no information on the plant's original design or current condition, but merely represents the company's "belief" that the plant would last that long. SCE further fails to provide evidentiary support for some of the basic assumptions for its life extension analysis. And, even under this flawed framework, SCE itself concludes that some of its investments extend the life of the facility. Finally, despite the Commission's clear direction, SCE simply ignored its duty to conduct a cumulative impact analysis on life extension.

a. SCE's Analytical Framework Is Fundamentally Flawed

SCE evaluated the life-extending implications of its investments by analyzing whether those investments provide customer benefits that exceed project costs within the remaining period of its contractual obligation to Four Corners. This analysis is based on the assumption

⁹ See, e.g., "SCE believes that the capital spending at issue in this proceeding will have very little bearing on the future of Four Corners Units 4&5 after SCE's participation ends..." Rebuttal Testimony at 15.

that the “life” of Four Corners is defined by the 50-year term of SCE’s co-ownership agreement and other contractual commitments to Four Corners. Yet, these contractual commitments have no bearing on the physical life of the plant as originally designed, nor on the remaining life of this plant based on its current condition. Although SCE makes the self-serving claim that its “capital spending decisions have been entirely consistent with the original 50-year life expectancy”¹⁰ it provides no objective evidence (such as guarantees from the turbine manufacturer or other technical evaluations) demonstrating that the plant, as originally designed, had a 50-year life expectancy. SCE also does not address the fact that its 50-year commitment to the plant may have assumed that major life-extending investments, such as the ones at issue here, would be necessary before 2016.

The fact that owners are now investing hundreds of millions of dollars into the plant to support what they claim to be “basic operation” belies SCE’s claim that the plant was designed to last 50 years. According to the expert opinion of Mr. Robert Koppe in his direct testimony, the life expectancy of the plant was more likely 30-35 years. SC-01 at p.4. SCE provided no objective rebuttal evidence to counter Mr. Koppe’s expert opinion.

Instead, the company dismisses Mr. Koppe’s opinion as “unsupportable speculation” and attempts to shift the burden of proof to Sierra Club by stating that “Sierra Club fails to explain how SCE’s 2007-2011 projects . . . do not comply with [the EPS].”¹¹ SCE thus fails to recognize that it carries the burden of proving compliance with the EPS; it is not Sierra Club’s burden to disprove SCE’s case. Decision 10-10-016 at 28-29; also see, ALJ Darling’s November 23, 2010 Scoping Ruling at App. A, p.1 (“Applicant has the burden of proof.”) By failing to provide any

¹⁰ Exhibit No. SCE-17, Vol.6 (Part 2) (“SCE Rebuttal Testimony”), at p.13: lines 16-17.

¹¹ *Id.* at p. 13: lines 17-23.

objective evidence showing that Four Corners was originally designed to last 50 years, SCE fails to meet its burden to show that any its investments do not “extend the life” of the plant.

Furthermore, as explained by Mr. Robert Koppe in his direct testimony (Exhibit SC-01 at 3-4), SCE’s life extension framework is fundamentally flawed because it could lead to absurd results. Specifically, as explained by Mr. Koppe, if one of Four Corner’s boilers were to explode and need replacement before 2016, SCE’s framework would not consider this massive project life-extending because it would not alter the term of SCE’s contractual commitment to Four Corners. SC-01 at p.3-4. SCE should not be eligible for California ratepayer compensation for life-extending, greenhouse gas-emitting capital investments in one of the largest sources of pollution in the country, without providing objective evidence showing that the plant was designed to last 50 years and that the plant’s current physical condition supports that 50-year life expectancy.

SCE next attempts to divert the Commission’s focus away from its investments by claiming that other factors, such as “securing a cost-effective fuel supply contract” and Clean Air Act compliance costs, have more of a life-extending impact than its investments.¹² These other factors are entirely irrelevant to the Commission’s EPS, which does not allow this type of “comparative analysis” on life extension. While these issues (along with a myriad of others) may also affect the future of the plant, they do not inform the Commission’s independent review of SCE’s proposed investments under the EPS.

b. SCE Acknowledges That at Least Six of Its Projects Are Life-Extending.

Even assuming Four Corner’s “life” is properly defined as the end of SCE’s contractual commitment to Four Corners in 2016, SCE itself concludes that at least six of its proposed

¹² *Id.* at 15; lines 26-29.

investments (SCE's share of which totals \$4.3 million) do not pay for themselves itself until after 2016, which postdates SCE's contractual obligation. SCE's Rebuttal Testimony at 56: lines 19-20. Thus, based on SCE's own analysis, these six projects are life-extending investments under the Commission's EPS and are therefore ineligible for ratepayer compensation.

c. SCE Acknowledges that Its 2013-2014 Investments Are Life-Extending

SCE's application includes \$62 million of investment in 2013-2014. As explained below, the EPS prohibits post-2011 investment in Four Corners. Yet, even if these investments were allowed by the EPS, SCE has failed to meet its burden to show that they are not life-extending. Without offering any objective analysis of the potential life-extension implications of these investments, SCE states that "SCE does not believe that these projects will cause plant reliability during 2014 to surge above 2000-2010 levels." SCE's Rebuttal Testimony at 22: lines 11-13. It then states, "We believe our 2012-2014 expenditure forecast is a reasonable basis for 2012 GRC ratemaking..." Id. at p. 23: lines 7-8. SCE admits that it lacks objective support for its belief by stating that "it is not possible to perfectly predict the rate at which ... equipment ... will continue to degrade" and by stating that "the frequency of outages is often somewhat random...." SCE Rebuttal Testimony at 23: lines 1-3, 15-17.

After asking the Commission to simply follow SCE's unsupported "belief" that these investments are not life-extending, SCE then contradicts its own belief by stating that if "the plant is to cease operation by mid-2016, it might be more cost effective to cancel many (or perhaps even all) of these 2014 overhaul projects and incur reduced reliability . . ." Id. at p. 22: lines 15-17; Id. at p.14: lines 14-15 ("many of these 2013-2014 projects will likely not be completed if the owners decide to shut down and decommission the plant at the end of the current ownership agreements.") In other words, according to SCE itself, the only purpose of

these investments is to extend the life of the plant beyond 2016. *Id.* These post-2011 investments thus violate the EPS even under SCE's flawed assumption that Four Corners has a 50-year life.

d. SCE Fails to Consider the “Big Picture” with Respect to Life Extension

As explained by Mr. Koppe, the typical lifespan of a coal-fired power plant built in the 1960s was 30 -35 years. SC-01 at p.4. Now that Four Corners is being operated well beyond its originally-designed lifetime, it is not surprising that some major components have worn out. *Id.* Thus, replacement of any one of these components contributes to extending the life of the unit. *Id.* at 4-5. And, as Mr. Koppe further explains, replacement of many worn-out components within a relatively short timespan unquestionably extends the life of a unit. *Id.* at 5. On that basis, Mr. Koppe finds that the projects proposed in this proceeding represent a massive life extension program for Units 4 and 5 of Four Corners. *Id.* at 5-6.

This is precisely why the EPS demands a “big picture” approach by requiring a cumulative impact analysis of SCE's capital investments. Decision 10-10-016 at 29 (Order, Paragraph No. 1(c)(iv)). This cumulative analysis goes to the primary objective of the EPS, which is to prevent “repowering” of high GHG-emitting power plants. D.07-01-039 at 53. SCE has not conducted a cumulative analysis of its currently proposed projects, thus SCE fails to meet its burden of proof for life-extension for this reason as well.

In response to Mr. Koppe's opinion that the cumulative impact of these investments constitute a massive life extension project, SCE argues that its capital expenditures “equate to only approximately 12%” of the cost of building a new power plant.” SCE's Rebuttal Testimony at 26: lines 8-11. This argument is a red herring. There is no dispute that it is cheaper to extend the life of Four Corners (an old, highly-polluting power plant that disproportionately impacts a low-income community of color) than to build a new, cleaner power plant elsewhere. But, the

economic motivation behind these investments has nothing with the current question before the Commission—i.e. whether these investments are prohibited life-extension projects under the EPS. Moreover, citing the relative economy of extending the life of the power plant cannot supplant an analysis of the cumulative life-extension impact of SCE’s replacement projects, when viewed as a whole. Because SCE has not conducted any cumulative life-extension analysis of its capital investments, it is ineligible for California ratepayer compensation for its investments under the EPS. Decision 10-10-016 at 29 (Order, Paragraph No. 1(c)(iv)).

e. SCE Provides No Basis for Its Replacement Cost Assumptions

A key aspect of SCE’s cost-benefit analysis for its capital investments includes the estimated cost of procuring replacement energy in the event of an equipment failure. Although SCE’s rebuttal testimony responded to Sierra Club’s critique of the company’s analysis by adjusting its estimated energy replacement costs downward by 50 percent, SCE fails to explain the basis for this newly reduced assumption and further fails to explain why it is reasonable. SCE must provide the basis for its replacement costs assumptions to meet its burden of proof on life extension.

f. SCE Provides No Basis for Its Assumed Failure Rates

Another key aspect of SCE’s cost-benefit analysis assumes certain failure rates for equipment if it is not replaced. According to Mr. Koppe, SCE’s assumed probabilities of equipment failure appear to be inflated. SC-01 at p. 13. In any event, SCE fails to provide any justification for its assumed rates of equipment failure. SCE thus fails to show why the replacement projects must take place before 2016 (the end of its contractual term).

3. SCE's Proposed Investments Increase the Capacity of Four Corners

a. "Nameplate" Capacity Has No Practical Significance

The original EPS also prohibits investments that increase the capacity of the power plant. D.07-01-039 at 5. SCE argues that the "capacity" of each unit should be defined as the capacity listed on the nameplate of each unit. A unit's "nameplate" is a metal plate that is usually affixed to the exterior of each unit of a power plant. The metal nameplate contains a theoretical maximum capacity of a unit under certain optimal design and operating conditions. As explained by Mr. Koppe, a unit's nameplate capacity has little to no bearing on a unit's actual operating capacity. SC-01 at 15-16. SCE itself acknowledges that plant's nameplate capacity is a theoretical number that is never achieved in practice. SCE Rebuttal Testimony at 29: lines 13-21.

More importantly, and as further explained by Mr. Koppe, from the perspective of quantifying emissions, it is a unit's actual capacity (as demonstrated by actual operation of the unit) that matters, not some theoretical number on a nameplate. SC-01 at 15-16. Therefore, SCE's focus on nameplate capacity has no practical relevance to the capacity and emissions increases caused by its projects. For this reason, SCE fails to show that its proposed projects will not actually increase the capacity of Units 4 and 5.

b. The Turbine Upgrade Projects Increased the Capacity of Four Corners

As explained by Mr. Koppe, a capacity-increase analysis must first disclose baseline capacity levels, supported by actual operational data, for each unit. Once that baseline is established, SCE must then compare the potential increase in capacity resulting from its proposed projects. SC-01 at 16-17. Although SCE did not perform this type of analysis in its

testimony, the exhibits to its rebuttal testimony provide information showing at least some of SCE's modifications (the HP turbine upgrades) did cause an actual increase in the capacity of Units 4 and 5. Although SCE readily admits that upgrades increased the generating capacity of each unit by 20 megawatts (from 750 megawatts to 770 megawatts), the company then misleads the Commission and the public by claiming that this higher capacity represents nothing more than increased efficiency. The company thus claims that it is now able to generate more power with the same amount of coal, "without a discernable increase in GHG emissions." SCE Rebuttal Testimony at p. 28: lines 22-26.

Information contained in the confidential exhibits to SCE's rebuttal testimony contradicts these claims. Those confidential exhibits include turbine cycle diagrams both before and after the modifications. Comparing the two sets of diagrams clearly shows that the turbine upgrades increased the plant's potential rate of coal combustion and its potential to emit greenhouse gases. Upon being cross examined on these confidential exhibits to his rebuttal testimony, Mr. Tom Ware confirmed the significance of heat input rate contained in these diagrams as follows:

Q: And all else being equal, a coal-fired power plant's greenhouse gas emission rate is directly related to its rate of coal combustion, correct?

A: Generally speaking, yes, that's correct.

Q: Mr. Ware, heat input is one way to measure a power plant's coal combustion rate, correct?

A: If by that term you mean measuring the amount of heat that's emitted to the boiler reflective of the amount of coal that's emitted to the boiler, yes.

See Transcript of August 11, 2011 Evidentiary Hearings ("August 11 Transcript"), p. 1837, lines 5-17. Upon being asked about the significance of the diagram on page B-12 of SCE-

17, Volume 6 (Part 3C) Appendices, Mr. Ware stated that to his best knowledge, that diagram provides the manufacturer's guaranteed turbine cycle before the company upgraded the plants turbine upgrades. Id. at p. 1842: lines 7-10; p.1843: lines 12-17. Mr. Ware further confirmed that the diagram on page B-11 of SCE-17, Volume 6 (Part 3C) Appendices provides the turbine cycle at the highest electric output (i.e. not guaranteed) before those turbine upgrades. Mr. Ware also confirmed that the equations at the bottom of each of those diagrams represent the heat input to the turbine at each output (guaranteed and non-guaranteed). August 11 Transcript at p. 1844. For each of those equations, heat input in Btu/hr can be ascertained by multiplying the denominator on the left side of the equation with the value on the right side of the equation.

The appendices to SCE's rebuttal testimony also provide turbine cycle diagrams representing the turbine cycle after the turbine upgrades. SCE-17, Volume 6 (Part 3C) Appendices, page B-118 and B-119. These diagrams represent the same two scenarios — guaranteed output on page B-119 highest design-level output (not guaranteed) on page B-118. The same heat input equation is provided at the bottom of each of these diagrams. Here again, multiplying the denominator of left side of the equation with the value on the right side of the equation provides the design-level heat rate in British thermal units per hour ("Btu/hr"). By comparing these post-turbine upgrade heat input rates with the heat input rates associated with the original turbine design (p. B-11 and B-12), it is clear that the modifications increased the design-level heat input rate for Units 4 and 5. This means that the high pressure turbine projects were designed to allow higher rates of coal combustion, thereby allowing more air pollution, including greenhouse gases, to be emitted by the plant.

The appendices to SCE's rebuttal testimony contain further evidence showing potential heat input increases. Specifically, as explained by Mr. Ware on cross-examination, the "net

supply cycle” value on page B-32 reflects the heat input rate of Unit 4 before the high pressure turbine upgrade, or the baseline heat rate. August 11 Transcript at pp. 1848-1851. Mr. Ware confirmed that that this value is millions of Btu/hr (“Mmbtu/hr). August 11 Transcript at p. 1848: lines 20-23. When compared to the heat rates for the turbine upgrades (after converting the heat rate values on pages B-118 and B-119 from Btu/hr to Mmbtu/hr), these values also show an increase in the heat rate from the turbine upgrades.

In light of the above evidence, SCE’s claim that it “has no reason to believe that any projects in this proceeding...have the potential to increase future GHG compliance costs” is false. SCE Rebuttal Testimony at 32: lines 4-7. SCE’s belief is not only contradicted by the evidence in the record, but also indicates willful ignorance. More specifically, upon being asked whether Mr. Ware had conducted any of the basic calculations described above to support his testimony, he responded in the negative. August 11 Transcript at p. 1851: lines 18-23.

SCE next argues that any increase in reliability from its investments should be measured against the average reliability “recorded by similar coal plants across North America” instead of being measured against the past performance of Four Corners. SCE Rebuttal Testimony at 24: lines 3-6. This argument has no legal or logical basis. The EPS requires evaluation of the necessity of SCE’s investments in the context of California’s general prohibition against new investment in coal-fired power plants; comparing an increase in reliability at Four Corners against a continental industry average does not serve this function and does not help SCE meet its burden to show that its investments are necessary before 2016.

Instead of examining the future implications of its modifications, SCE’s testimony also focuses on past emission levels and past capacity factors to claim that it has not increased the capacity or extended the life of the plant. See, e.g., SCE’s rebuttal testimony at 32. This historic

information is irrelevant to the question of whether the modifications have increased the total capacity and the resulting potential to emit pollution in the future, should the owners decide to use that extra capacity. Also, SCE's historical analysis ends at 2010, when the Unit 4 turbine upgrade occurred. Because it does not provide capacity or emissions information after the turbine upgrade, SCE's historical analysis is irrelevant for a second reason.

4. SCE Has Not Shown that the Proposed Investments Are Necessary for Basic Operation of the Plant until 2016.

As explained above, SCE's investments extend the life and increase the capacity of Four Corners. Under the Commission's EPS for Four Corners, for all investments that exceed \$1 million, SCE must demonstrate "whether, in considering the cost and benefits and the prohibition on long-term investment at Four Corners, the investment is necessary within the period of SCE's existing contractual obligations." D. 10-10-016 at 20. As explained below, SCE has failed to make this showing.

SCE characterizes its proposed projects as necessary to maintain reliable operation of Four Corners until 2016. On the one hand, SCE claims that the plant would suffer from a decrease in reliability without the proposed projects. Yet, on the other hand, SCE indicates that at least one category of projects, its boiler tube replacements, were aimed at reducing the forced outages caused by tube leaks, which averaged 679 hours per year and apparently accounted for "4% of the total 18% of unavailability of Units 4&5" during 2006-2010. SCE's rebuttal testimony at 36: lines 19-12. SCE fails to quantify the actual change in reliability that resulted from the past replacements or the anticipated change in reliability from the future replacements. It has thus failed to show that these investments are necessary to maintain levels of reliability to support "basic operation" of the plant in light of the EPS's prohibition on new investment. Moreover, SCE has not explained why some incremental decrease in the reliability of Units 4

and 5 would be unacceptable or prevent basic operation of the plant until 2016, given the EPS' prohibition on new investment in the plant. In short, SCE's reliability-based conclusions are not only based on an incomplete analysis, but also lack evidentiary support.

For example, SCE claims that [t]he only practical alternative to tube panel section replacement . . . is to simply incur an increasing number of costly forced outages, and individually replace the tubes as they fail." SCE's Rebuttal testimony at 35:lines 22-24. Yet, the company does not discuss anticipated future rates of failure (until 2016) without the replacements, does not provide failure rates that would allow for "basic operation" of the plant and does not explain why individual tube replacement is cost prohibitive in the near term. Instead, SCE's reliability discussion for these projects consists of the following: "If these degraded tube panels are not replaced, reliability will go down." Id. at p.36: lines 21-22. Similarly, with respect to its GSU transformer replacement scheduled for 2014, SCE claims that it will experience a 10% probability of failure beginning in 2014, but does not explain why incurring such a risk until 2016 is unreasonable. SCE Rebuttal testimony at 44: lines 33-34. Such generalized language does not explain why these replacements must take place to support basic operation of the plant until 2016. SCE's discussion of the remaining replacement projects suffers from the same defect.

On the issue of reliability, Mr. Koppe reaches the opposite conclusion to that of SCE in his attached testimony. Mr. Koppe expects that these projects are intended to increase the levels of reliability of the units, rather than simply maintain historical levels of reliability. SC-01 at 8. In fact, with respect to the boiler tubes, Mr. Koppe explains that the replacement equipment is expected to result in little or no outage time in the future, which would improve the overall performance of the facility. Thus, these projects are not solely intended to maintain "basic

operation” of the power plant, but will result in an incremental increase in the reliability of the affected unit over historical levels. *Id.* at 8-9. To support its claim that these projects are cost-effective in the near term, SCE must provide evidence to show that the cost of improving the units is not greater than the cost of simply maintaining them for the next five years.

As the purported basis for its reliability-based arguments, SCE points to language related to the Mohave Generating Station in the Commission’s decision in SCE’s 2003 GRC. SCE Rebuttal Testimony at 17; D.04-07-022. SCE’s reliance on this language is indicative of its “business as usual” approach to its current investments. The EPS did not exist at the time of SCE’s 2003 GRC, making the Commission’s review of SCE’s investment in Mohave irrelevant to whether SCE’s investment in Four Corners complies with the EPS. More importantly, by relying on the Commission’s approach to investment in previous GRCs, SCE fails to acknowledge the new requirements and higher standard of proof under the EPS. In short, SCE argues that it should be allowed to use the same framework it has always used to obtain ratepayer compensation for its investments. Such an approach not only violates the EPS, but attempts to render it meaningless.

a. SCE Failed to Consider a Reasonable Range of Alternatives

For each capital project, SCE merely compares the alternative of complete replacement with the alternative of simply fixing failures. As explained by Mr. Koppe in his testimony, it fails to consider more nuanced alternatives such as extended maintenance or partial replacement, even though such alternatives would likely be more appropriate if a unit was scheduled for retirement in five years or less. SC-01 at 4. Extended maintenance or partial replacement would generally be less expensive than complete replacement and would minimize the amount of money committed to the units. By artificially constraining the range of options to address reliability concerns, SCE thus fails to show that its replacement projects are cost-effective.

One example of SCE's failure to examine alternatives involves its coal ash impoundment expansion projects. The new coal ash impoundments would be located above existing impoundments on the site. SCE admits that it is monitoring for soil and groundwater contamination from these impoundment structures¹³, and does not dispute that liability resulting from any such contamination could be passed on to California ratepayers. Yet, the company has simply refused to disclose whether there is soil and/or groundwater contamination resulting from these impoundments and further fails to analyze whether alternatives to the project, such as off-site coal ash disposal, would better serve the economic interest of California ratepayers. Such disclosure and analysis are particularly important given SCE's potential obligations under upcoming federal regulation of coal ash, which would include corrective action on existing contamination.¹⁴

B. The EPS Prohibits SCE's Post- 2011 Investment

In this proceeding, SCE is requesting Commission approval for certain post-2011 investments. Although the Four Corners-specific EPS is narrowly tailored to provide SCE a limited exemption for pre-2012 capital expenditures, it creates a presumption against investment in 2012 and beyond. The decision specifically states that "we cannot treat the period from 2012 through 2016 in the same way [as pre-2012], since this four-year period occurs after CARB's AB 32 rules take effect. Accordingly, we should deny SCE's request to recover in rates any capital costs planned for Four Corners Units 4 or 5 in 2012 or later, if the related capital projects will increase the life of the powerplant by five years or more." Decision 10-10-016, dated October 14, 2010 at 19. Further on, the decision contains even more definitive language in its legal conclusions:

¹³ August 11 Transcript at pp. 1852, 1855.

¹⁴ <http://www.epa.gov/osw/nonhaz/industrial/special/fossil/ccr-rule/ccr-table.htm>

After January 1, 2012, SCE's ratepayers would be exposed to potential financial risks to bring Four Corners into compliance with the pollution control requirements established by CARB pursuant to AB 32; therefore, approving a wholesale EPS exemption for Four Corners would be unsound, as would approving an EPS exemption for capital expenditures made after January 1, 2012.

Id. at 27-28; Conclusion of Law #1 (emphasis added).

This language is consistent with the Public Utilities Code, which states that “[t]he commission shall not approve a long-term financial commitment by an electrical corporation unless any baseload generation supplied under the long-term financial commitment complies with the greenhouse gases emission performance standard established by the commission pursuant to subdivision (d).” Code § 8341(b)(1). There is no question that Four Corners does not meet the Commission's EPS. Furthermore, the Code's plain language definition of “long-term financial commitment” is broad and includes any “new ownership investment in baseload generation.” Id. at § 8340(f). In sum, under the EPS and the Code, SCE is legally prohibited from making new capital investments in Four Corners after 2011.

IV. CONCLUSION

In light of the above, SCE's request for \$138.475 million in California ratepayer compensation should be denied.

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Respectfully submitted,

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