

Memorandum

To: Chair Robert B. Weisenmiller
Commissioner Karen Douglas
Commissioner David Hochschild
Commissioner Andrew McAllister
Commissioner Janea A. Scott

Date: October 19, 2018

From: Drew Bohan
Executive Director

Subject: APPROVAL OF A CITY OF PASADENA EMISSION PERFORMANCE STANDARD COMPLIANCE FILING

On October 2, 2018, the City of Pasadena (Pasadena) submitted a compliance filing requesting the Energy Commission find that Pasadena's covered procurement for the proposed Intermountain Power Project (IPP) Repowering Project (Project) be determined to be compliant with the Energy Commission's Greenhouse Gases Emission Performance Standard (EPS), pursuant to Title 20 of the California Code of Regulations, Section 2900, et seq.


Senate Bill 1368 (Perata, Chapter 598, Statutes of 2006) limits long-term investments in baseload generation by the state's utilities to power plants that meet an EPS jointly established by the Energy Commission and the California Public Utilities Commission. The CO₂ emission rate limit is 1,100 pounds per megawatt-hour. The EPS establishes a public process for determining the compliance of proposed utility investments. Utilities are required to submit a compliance filing upon committing to an investment that is required to meet the EPS.

A prior compliance filing by Pasadena for the IPP Project was submitted to the Energy Commission in October 2016 and approved pursuant to Order No. 16-1109-4. In that Order, the Energy Commission approved the procurement of energy from IPP's proposed 1,200 megawatt natural gas combined cycle (NGCC) facility. Since that time, participants in the IPP Project have re-evaluated their long-term power needs and have determined that new advanced class gas turbines with a reduced combined total output of 840 megawatt will allow additional capacity of renewable energy on the transmission lines associated with IPP.

The Siting Division has informed Energy Assessments Division staff that the three proposed NGCC manufacturers presented in Pasadena's compliance filing will meet the EPS, even if operated at their least efficient, highest greenhouse-gas-emitting load of 50 percent. This change in natural gas turbine technology in the IPP Project will still result in Pasadena's complete divestiture of all coal-based fuel in their generation resources portfolio two years earlier than was originally planned.

Chair Robert B. Weisenmiller
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Energy Commission staff completed a review of the compliance filing and determined that it is compliant with the Emission Performance Standard pursuant to Section 2902(a); specifically, that the proposed NGCC power plant design in the compliance filing is below the EPS limit of 1,100 pounds per megawatt-hour. Therefore, staff recommends the Energy Commission find that the covered procurement described in Pasadena's compliance filing complies with the Energy Commission's Greenhouse Gases Emission Performance Standard, Title 20, Section 2900 et seq., of the California Code of Regulations.



Drew Bohan
Executive Director

10-19-18

Date

Attachment



PASADENA WATER AND POWER

October 1, 2018

California Energy Commission
EPS Compliance
1516 Ninth Street
Sacramento, CA 95814-512
Attention: Compliance Filing

Re: Pasadena Emission Performance Standard Compliance Filing for the Intermountain Power Project Repowering Project ("IPP Repowering Project")

Dear Sir or Madam:

Summary

The City of Pasadena, Water and Power Department ("PWP") hereby submits the attached Compliance Filing package, seeking California Energy Commission ("CEC") approval of the Compliance Filing for the IPP Repowering Project as required by Senate Bill 1368 ("SB 1368"). The Intermountain Power Agency ("IPA") holds legal title to the Intermountain Power Project ("IPP"), which includes two 900 MW (net) coal generating units located near Delta, Utah. The Los Angeles Department of Water and Power ("LADWP") is IPA's Project Manager and Operating Agent for IPP. The City of Pasadena ("Pasadena"), along with LADWP and other municipal and cooperative entities ("Purchasers"), buy IPP's energy.

A prior Compliance Filing package for the IPP Repowering Project was submitted to the CEC in October of 2016, which was approved by the CEC pursuant to Order No: 16-1019-3. In that order, the CEC approved replacing IPP's combined 1,800MW coal generating units with CEC SB 1368 Emission Performance Standards ("EPS") compliant natural gas combined cycle ("NGCC") units totaling 1,200MW. Since then, IPA, LADWP and the other Purchasers have evaluated the needs of the IPP participants, and have determined that those needs would be addressed with an advanced class gas turbine with a reduced total output from 1,200MW to 840MW. The reduction in output will allow for additional capacity on the transmission lines associated with IPP for renewable energy integration, while still maintaining the minimum required dispatchable generation necessary to support the HVDC Transmission system that connects Utah and the Intermountain West Region with California.

Background

IPA, a political subdivision of the State of Utah, began construction of IPP in October 1981, with commercial operation of Unit 1 commencing in June, 1986 and of Unit 2 in May, 1987. Each Purchaser's share of IPP's generation was established by a Power Sales Contract, as entered into between IPA and the Purchasers. The Purchasers include 23 Utah municipalities, six rural electric cooperatives, and six California municipalities as follows:

UTAH MUNICIPAL PURCHASERS:

Beaver
Bountiful
Enterprise
Ephraim
Fairview
Fillmore
Heber
Holden
Hurricane
Hyrum
Kanosh
Kaysville
Lehi
Logan
Meadow
Monroe
Morgan
Mt. Pleasant
Murray
Oak City
Parowan
Price
Spring City

UTAH COOPERATIVE PURCHASERS:

Bridger Valley REA
Dixie-Escalante REA
Flowell Electric Assoc.
Garkane Power Assoc.
Moon Lake Elec. Assoc.
Mt. Wheeler Power, Inc.

CALIFORNIA PURCHASERS:

Anaheim
Burbank
Glendale
LADWP
Pasadena
Riverside

Although the Power Sales Contracts will expire on June 15, 2027, those contracts require IPA to offer the Purchasers the right to continue participating in an IPP Repowering Project beyond that date by entering into the Renewal Power Sales Contracts and the Agreement for Sale of Renewal Excess Power ("Renewal Contracts").

Subsequent to the CEC's approval of the IPP Repowering Project by Order No: 16-1019-3, Pasadena and Purchasers entered into the Renewal Contracts in early 2017.

Alternative Repowering of the IPP Repowering Project

Pursuant to the current Power Sales Contracts, which provide for the previously approved EPS-compliant IPP Repowering Project, an Alternative Repowering is also permitted in the event Purchasers choose that course. Accordingly, the Purchasers have exercised the desire for an Alternative Repowering to reduce the previously approved IPP Repowering Project for 1,200MW of EPS compliant NGCC to 840MW of EPS compliant NGCC.

Based on the generation power blocks currently available on the market, there are three (3) options for this generation output and generation type, as summarized in the Attachment A.

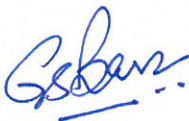
Compliance Filing:

Pursuant to 20 CCR § 2900 *et seq.*, of the California Code of Regulations, adopted by the CEC to implement SB 1368, Pasadena hereby submits the attached Compliance Filing. In submitting this filing, Pasadena respectfully requests that the CEC determine that the Alternative Repowering of the previously approved IPP Repowering Project is similarly in compliance with the EPS regulations promulgated by the CEC.

The CEC Compliance Filing is provided as Attachment 2. Attachment 3 is the attestation required by 20 CCR § 2909.

If the CEC has any questions or requests additional information regarding this coal divestiture and EPS-compliant repowering, please contact the following representative of PWP, Power Resource Planning Manager: Mandip Samra, (626) 744-7493, msamra@cityofpasadena.net.

Sincerely,



Gurcharan Bawa
General Manager
Pasadena Water and Power

Attachments

ATTACHMENT 2

CALIFORNIA ENERGY COMMISSION EMISSION PERFORMANCE STANDARD COMPLIANCE FILING

DESCRIPTION OF IPP REPOWERING PROJECT

Name of Facility: Intermountain Power Project

Location of Facility: 850 W Brush Wellman Road, Delta Utah 84624

Proposed Technology/Fuel: Natural Gas-Fired Combined Cycle Generating Facility

Planned Commercial Operation Date: July 1, 2025

Generation Configuration Options:

Preliminary Rated Capacity and CO₂ emission estimates were developed from vendor data with station service loads and long term degradation applied for the IPP Repowering Project at site conditions of: 102 °F, 9.7% RH, and an elevation of 4760 ft. with evaporative inlet cooling. The combined unit output will be limited to a maximum of 840 MW Net.

Prime Mover	1x1 Combined Cycle	1x1 Combined Cycle	1x1 Combined Cycle
Quantity	2	2	2
Manufacturer	GE	Siemens	Mitsubishi
Model	7HA.02	SGT6-9000HL	M501JAC
Rated Capacity (MW), at IPP Site	435 each, 870 total	430 each, 860 total	451 each, 902 total
Fuel Used	Natural Gas	Natural Gas	Natural Gas
EPS Compliant	Yes	Yes	Yes
Expected Operating Profile	See Figure 3	See Figure 3	See Figure 3
Expected energy output (MWh)	See Figure 3	See Figure 3	See Figure 3
Expected fuel use profile	See Figure 4	See Figure 5	See Figure 6
Estimated CO ₂ emissions for site conditions, (lbs/MWh)	752	755	764
Estimated CO ₂ emissions after derate	756	761	771

Figure 1 - Generation Configuration Options.

Power Purchase Contract Terms

Name of Counter Party: Intermountain Power Agency (IPA)

Length of Renewal Power Sales Contract: 50 years

Duration: July 1, 2027 – June 15, 2077

Product: Energy (MWh)

Capacity for Project: 840 MW¹

Capacity for Participants: Below in Figure 2, is the subscribed generation entitlement for each Participant under the Renewal Power Sales Contracts.

CALIFORNIA PURCHASERS		
PURCHASER	SHARE TO BE DELIVERED	SHARE OF 840 MW
Burbank	4.167%	35
Glendale	4.167%	35
LADWP	64.775%	544
Pasadena	1.667%	14
Riverside	4.167%	35
GROUP TOTAL	78.943%	663
UTAH COOPERATIVE PURCHASERS		
GROUP TOTAL	7.017%	59
UTAH MUNICIPAL PURCHASERS		
GROUP TOTAL	14.040%	118
PURCHASER TOTAL	100.000%	840

Figure 2 - Generation Distribution

Expected Deliverables: Please refer to Figure 2

Must Take Provisions: Please refer to Figure 2

Dispatch Provisions: It is assumed that LADWP will continue its responsibilities as the Operating Agent for the repowered IPP units, and will continue to be responsible for the dispatch of the IPP units based on Participant and system demand.

Unit Contingency: N/A

Expected Operating Profiles:

A simulation of the load profile performed by LADWP staff is below in Figure 3 utilizing the GE configuration. The Siemens and Mitsubishi options will follow similar profiles as the heat rates and other characteristics are comparable. The load profile was used to derive the average estimated energy output per year as shown below:

Energy Output (MWh): 5,003,712

The average annual capacity factor for all manufacturers is 68%.

¹ The Project size per the Partnership needs is limited to 840 MW Net. The Generation Scenarios listed above are based on the available generation sizes from the 3 respective vendors.

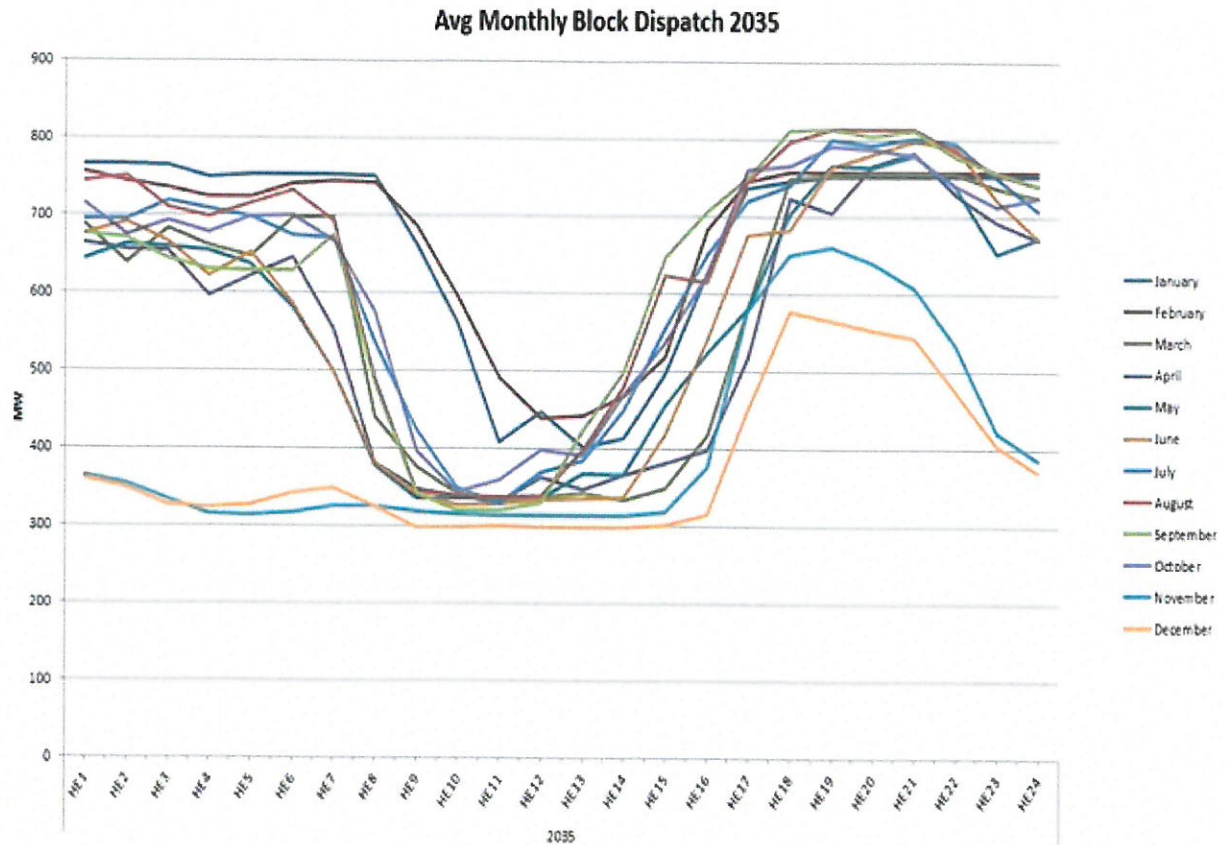


Figure 3 - Average Monthly Block Dispatch

Expected Fuel Use Profile:

Below is the preliminary fuel use data received from each respective vendor, estimated for the IPP site conditions.

GE - Estimated Combined Cycle Data for IPP Repowering				
All data estimated for site conditions, no duct firing, cooling towers				
Evaporative Cooling		On	Off	Off
Load		100%	100%	80%
Net Block Output	MW	435	385	313
Block Heat Input (HHV)	MMBTU/h	2,794	2,484	2,073
CO2 Emissions	lbs/MWh	752	755	775
				815

Figure 4 - GE Fuel Use Profile (from vendor data)

Siemens - Estimated Combined Cycle Data for IPP Repowering					
All data estimated for site conditions, no duct firing, cooling towers					
Evaporative Cooling		On	Off	Off	Off
Load		100%	100%	80%	60%
Net Block Output	MW	430	381	309	242
Block Heat Input (HHV)	MMBTU/h	2,776	2,475	2,124	1,756
CO2 Emissions	lbs/MWh	755	761	803	849

Figure 5 - Siemens Fuel Use Profile (from vendor data)

Mistubishi - Estimated Combined Cycle Data for IPP Repowering					
All data estimated for site conditions, no duct firing, cooling towers					
Evaporative Cooling		On	Off	Off	Off
Load		100%	100%	80%	60%
Net Block Output	MW	451	414	339	265
Block Heat Input (HHV)	MMBTU/h	2,942	2,720	2,282	1,860
CO2 Emissions	lbs/MWh	764	768	787	820

Figure 6 - Mitsubishi Fuel Use Profile (from vendor data)

Data from Existing Plant – Apex Generating Station

Below in Figure 7 is average hourly data extracted from LADWP's Apex Generating Station located in Clark County, Nevada. The plant consists of a GE MS7000FA 527 MW 2x1 Combined Cycle generating station. The total energy output for the plant in 2015 was 2,635,293 MWh, with a resultant capacity factor of 57%.

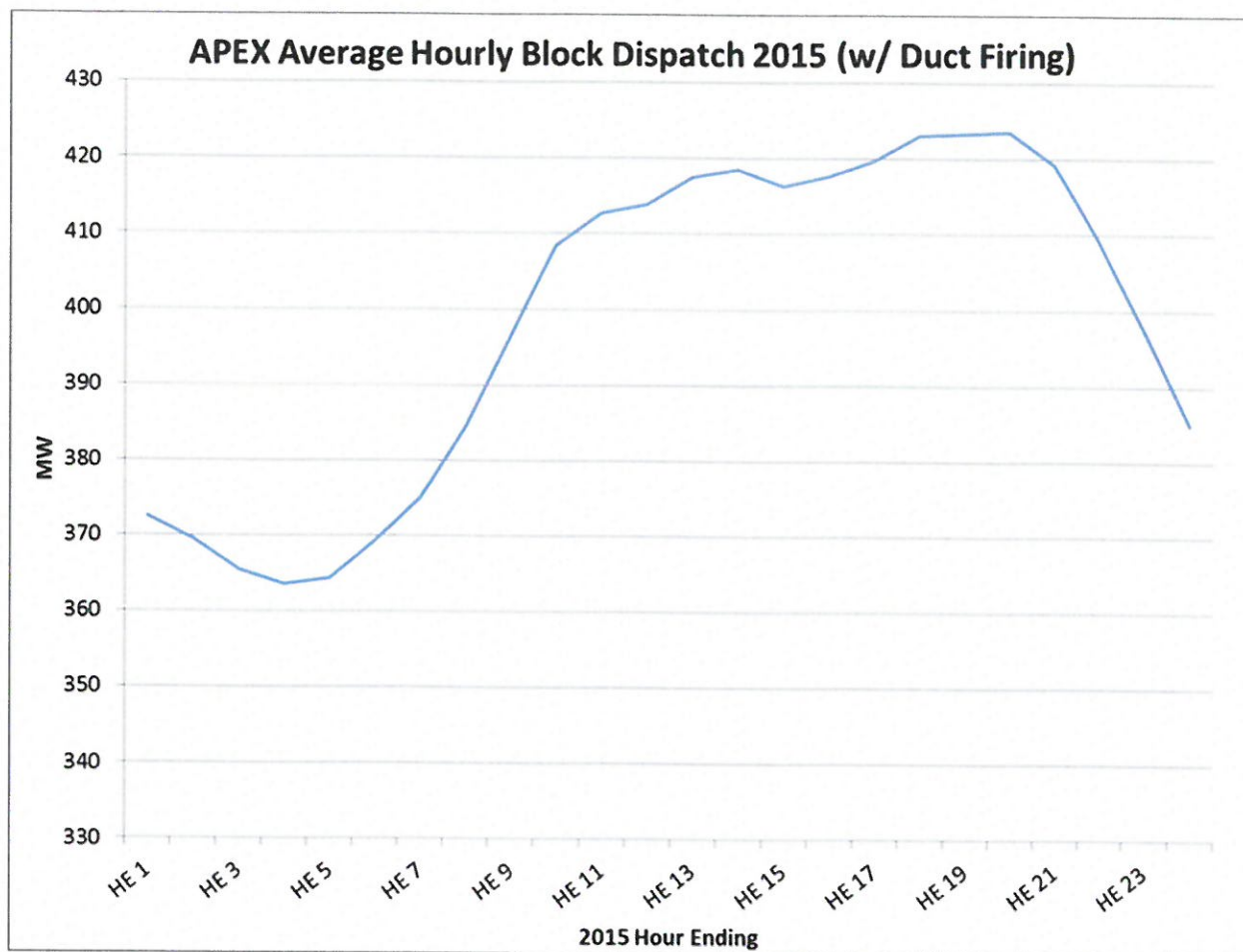


Figure 7 - Apex 2015 Load Profile

Apex - Data									
Load		100%	90%	80%	70%	60%	50%	40%	30%
Net Plant Output	MW	531	478	425	372	319	266	212	192
CO2 Emissions	lbs/MWh	884	835	841	856	886	939	1,031	1,084

Figure 8 - Apex 2015 Fuel Use Profile

ATTACHMENT 3

CALIFORNIA ENERGY COMMISSION
EMISSION PERFORMANCE STANDARD COMPLIANCE FILING
ATTESTATION

I, the official named below, certify under penalty of perjury, the following:

1. I am an agent of the City of Pasadena authorized by its City Council to sign this attestation on its behalf;
2. The City Council has reviewed and approved in noticed public meetings both the covered procurement (on July 20, 2015) and the Compliance Filing (July 9, 2018) to which this attestation is attached;
3. Based on the City Council's knowledge, information, and belief, the Compliance Filing does not contain a material misstatement or omission of fact;
4. Based on the City Council's knowledge, information, or belief, the covered procurement complies with Title 20, Division 2, Chapter 11, Article 1 of the California Code of Regulations; and
5. The covered procurement contains the contractual terms or conditions specifying that the contract or commitment is void and all energy deliveries shall be terminated no later than the effective date of any CEC decision pursuant to 20 CCR § 2910 that the covered procurement fails to comply with 20 CCR § 2900 *et seq.*

Executed this 1st day of October, 2018, at Pasadena, California.



GURCHARAN BAWA
General Manager
Pasadena Water & Power

CALIFORNIA ENERGY COMMISSION

1516 Ninth Street
Sacramento, California 95814

**STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION**

IN THE MATTER OF:)	DOCKET No. 18-EPS-01
)	[PROPOSED] ORDER No.
)	
CITY OF PASADENA EMISSION PERFORMANCE)	
STANDARD COMPLIANCE FILING)	
)	

I. INTRODUCTION

Pursuant to Public Utilities Code section 8341(e)(1), the Energy Commission established a greenhouse gases emission performance standard (EPS) of 1,100 pounds carbon dioxide per megawatt hour, as codified in Title 20 of the California Code of Regulations, sections 2900 *et seq.* The Energy Commission is responsible for reviewing all long-term financial commitments entered into by local publicly owned electric utilities for compliance with the EPS.

II. FINDINGS

a. On October 2, 2018, the City of Pasadena (Pasadena) submitted a compliance filing requesting that the Energy Commission find that Riverside's Second Amendatory Power Sales Contract (contract) with the Intermountain Power Agency (IPA) for electricity from the Intermountain Power Project (IPP) Repowering Project, which involves replacing the existing coal facility as LADWP's source of generation with a new natural gas-fired combined cycle power plant, be determined to be compliant with the EPS;

b. On October 19, 2018, Energy Commission staff submitted a review of Pasadena's filing and found it complete. Based on its review, staff recommended that the procurement be found to be in compliance with the EPS; and

c. The Energy Commission concurs with staff's recommendation that Pasadena's compliance filing is complete and that the contract with IPA, as described in the compliance filing, complies with the EPS.

III. CONCLUSION AND ORDER

The California Energy Commission hereby adopts staff's recommendation and orders that the long-term financial commitment described in Pasadena's compliance filing complies with the Energy Commission's Greenhouse Gases Emission Performance Standard, as codified in Title 20 of the California Code of Regulations, sections 2900 *et seq.* Should the final design significantly change from the specifications provided in the compliance filing, Pasadena must submit a subsequent compliance filing providing the updated information.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the California Energy Commission held on November 7, 2018.

AYE:

NAY:

ABSENT:

ABSTAIN:

Cody Goldthrite, Secretariat
California Energy Commission