

12745 N. Thornton Road Lodi, CA 95242

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Notice – Call of Special PPC Meeting

Date: February 12, 2020

To: NCPA Lodi Energy Center Project Participant Committee

From: Jiayo Chiang, Chairman

Subject: February 19, 2020 LEC PPC Special Meeting Notice & Agenda

PLEASE TAKE NOTICE that pursuant to Government Code section 54956, a special meeting of the Northern California Power Agency Lodi Energy Center Project Participant Committee is hereby called for **Wednesday, February 19, 2020 at 10:00 a.m.** to discuss those matters listed in the attached Agenda. The meeting will be held at the Northern California Power Agency, 12745 N. Thornton Road, Lodi, California.

If you are unable to attend the meeting in person at the Lodi location and wish to attend via teleconference, in accordance with The Brown Act, you must attend at one of the locations listed on the Agenda and post the Agenda at that location by 10:00 a.m. no later than 24 hours prior to the meeting commencement date and time, in a location that is accessible to the public until the completion of the meeting.

hang Chairman



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LEC PPC – Special Meeting Agenda

Date:	February 12, 2020
Subject:	February 19, 2020 Lodi Energy Center Project Participant Committee Meeting
Location:	12745 N. Thornton Road, Lodi, CA and/or Posted Teleconference Locations
Time:	10:00 a.m.

*** In compliance with the Brown Act, you may participate in person at the meeting location or via teleconference at one of the locations listed below. <u>In either case</u>, please: (1) post this notice at a publicly accessible location at the <u>participation</u> location at least 72-hours before the meeting begins, and (2) have a speaker phone available for any member of the public who may wish to attend at your location.

NCDA	NCDA	
651 Commerce Drive	12745 N. Thornton Road	401 Grove Street
Roseville, CA 95678	Lodi, CA 95241	Healdsburg, CA 95448
BAY AREA RAPID TRANSIT	CITY OF GRIDLEY	CITY OF LOMPOC
300 Lakeside Drive, 16 th Floor	685 Kentucky Street	100 Civic Center Plaza
Oakland, CA 94612	Gridley, CA 95948	Lompoc, CA 93438
		• •
CITY OF BIGGS	PLUMAS-SIERRA RURAL	POWER & WATER RESOURCES
465 "C" Street	ELECTRIC COOP	POOLING AUTHORITY
Biggs CA 95917	73233 Highway 70	17207 Industrial Farm Rd
	Portola CA 06122	Bakarafiald CA 022208
	FUILUIA, CA 90122	Bakersheiu, CA 955500
CALIFORNIA DEPARTMENT OF	SILICON VALLEY POWER/CITY OF	CITY OF UKIAH
WATER RESOURCES	SANTA CLARA	300 Seminary Avenue
2135 Butano Drive. Suite 100	881 Martin Avenue	Ukiah, CA 95482
Sacramento CA 95825	Santa Clara, CA 95050	
CITY OF AZUSA		
729 N. Azusa Avenue		
Azusa, CA 91702		

Persons requiring accommodations in accordance with the Americans with Disabilities Act in order to attend or participate in this meeting are requested to contact the NCPA Secretary at 916.781.3636 in advance of the meeting to arrange for such accommodations.

The Lodi Energy Center Project Participant Committee may take action on any of the items listed on this Agenda regardless of whether the matter appears on the Consent Calendar or is described as an action item, a report, or an information item. If this Agenda is supplemented by staff reports, they are available to the public upon request. Pursuant to California Government Code Section 54957.5, the following is the location at which the public can view Agendas and other public writings: NCPA, 651 Commerce Drive, Roseville, CA or <u>www.ncpa.com</u>

1. Review Safety Procedures

2. Call Meeting to Order and Roll Call

PUBLIC FORUM

Any member of the public who desires to address the Lodi Energy Center Project Participant Committee on any item considered by the Lodi Energy Center Project Participant Committee at this meeting, before or during the Committee's consideration of that item, shall so advise the Chair and shall thereupon be given an opportunity to do so. Any member of the public who desires to address the Lodi Energy Center Project Participant Committee on any item within the jurisdiction of the Lodi Energy Center Project Participant Committee and not listed on the Agenda may do so at this time.

BUSINESS ACTION ITEMS

- 3. Lodi Energy Center Turbine Restoration Project Staff to present the Committee with additional information regarding the cause of the current LEC unit forced outage, and provide options for bringing the unit back in service.
- 4. Lodi Energy Center Transformer Replacement Project Request for Additional Funds Staff is seeking a recommendation for approval of additional funds for the Lodi Energy Center Transformer Replacement Project, increasing the total project not to exceed amount from \$4,000,000 to \$4,425,000, and delegating authority to the General Manager or his designee to award bids, execute agreements, and issue purchase orders for the updated project amount, and authorize a budget augmentation for the Lodi Energy Center FY20 budget of \$425,000 to fund this project.

ADJOURNMENT

Persons requiring accommodations in accordance with the Americans with Disabilities Act in order to attend or participate in this meeting are requested to contact the NCPA Secretary at 916.781.3636 in advance of the meeting to arrange for such accommodations.



Lodi Energy Center Project Participant Committee Staff Report

AGENDA ITEM NO.:03

Date:	February 19, 2020
Meeting D	Date: February 19, 2020
То:	Lodi Energy Center Project Participant Committee
Subject:	Lodi Energy Center Turbine Restoration Project

Proposal

Staff recommends that the Lodi Energy Center Project Participant Committee approve the Lodi Energy Center Turbine Restoration Project Option #3 (New F4 Machine) in an amount not-to-exceed \$50,800,000; and authorize the NCPA General Manager to execute agreements, including revisions to the Long Term Maintenance Agreement, and issue Purchase Orders to carry out that work. Funding will come from insurance coverage and LEC's Maintenance Reserve account. The Maintenance Reserve will be replenished over four years in future budget years, beginning with FY21.

Background

On January 16, 2020 at 3:54 a.m. the Lodi Energy Center experienced a sudden failure on the combustion turbine. Prior to this failure, the LEC had been operating steady state at 260 MW for about two hours, and had been online for about two days. The length of time between the first sign of problems and the unit trip was about two seconds.

The LEC is under a long term contract with Siemens for work on the machine. This long term contract includes warranty provisions which are dependent upon the nature and part that might fail. This warranty coverage is limited to \$1,000,000 per incident. In addition, the language in the agreement requires that Siemens perform any work thought to be a warranty claim. If the work is subsequently discovered to be a valid warranty claim, Siemens will credit the cost back to NCPA.

NCPA has filed a claim with the insurance carrier regarding the property damage loss. The deductible for insurance is \$500,000. The insurance carrier is generally agreeable to the costs presented by Siemens for the like kind restoration. They are acting on NCPA's request to begin funding in advance. They anticipate an advance of 30% of the projected costs will be complete by the end of February.

Upon discovery of the failure, NCPA contacted Siemens and issued purchase orders within its authority to begin disassembly work to start the investigation as to the cause of failure. The assessment of the damage has now been completed. It has been determined that a significant number of the components in the turbine have been damaged. As a result, the cost to restore

Lodi Energy Center Turbine Restoration Project February 19, 2020 Page 2

this turbine is nearly the same as the purchase of a replacement turbine. Siemens has provided four options for restoration of this unit, as follows:

Option #1 (F3 Machine-Original). This option is not recommended because it restores the turbine to the original specifications with the inherent known risks.

Option #2 (Hybrid Rotor).

Option #4 (5ee Machine). Neither of these options were considered due to the lengthy lead time required to implement and not enough capability by the Generator Step-Up transformer to take advantage of the increase MW capability.

Option #3 (New F4 Machine). This option recommended. It replaces the turbine with a new F4 (revision) machine. The price and schedule for this option are identical to Option #1. In addition, NCPA has prepaid \$7,800,000 towards the Major Maintenance interval that will no longer occur. Because the F4 machine has higher maintenance costs, the following was negotiated using the prepaid dollars, Siemens will hold the variable rate flat, provide Ultra Low NOx Combustors and provide the Purge Credit option. The Long Term Maintenance Agreement will be modified to reflect these changes.

Selection Process

During the initial procurement of LEC equipment, a Public Works bidding process was followed. Siemens was awarded the contract for the LEC equipment as a result of that bid. Under the terms of the contract, Siemens is required to perform the work on the machine in order to preserve the warranty.

Fiscal Impact

The total cost for the restoration of LEC is projected to be \$50,800,000. Insurance is expected to cover all but \$800,000. Of that total, \$500,000 is the deductible and \$300,000 is for costs related to the upgrade that insurance is not expected to cover. NCPA recommends initially funding these costs through the Maintenance Reserve Fund, with the understanding that the Maintenance Reserve Fund will need to replenished in future budget years by increasing the funding by \$200,000 over four budget years beginning with FY21.

Description	Cost
Siemens Scope	\$39,150,653
Sales Tax	~\$3,349,347
Support (Crane, Scaffold, Insulation, etc)	~\$3,000,000
Incidentals (Permitting)	~\$300,000
Contingency	\$5,000,000
Total	~\$50,800,000

Funding for this project will come from the following sources. Project Participants would fund the deductible and additional funding as noted above.

Lodi Energy Center Turbine Restoration Project February 19, 2020 Page 2

Source	Amount
Insurance	\$50,000,000
Deductible	\$500,000
Additional Funding	\$300,000

Environmental Analysis

This project will be reviewed with the Air District and the California Energy Commission. It is expected that these activities are categorically exempt under Class 1 and 2 from the provisions of the California Environmental Quality Act pursuant to Section 15301 (b) and 15302 (c) of the CEQA Guidelines. A Notice of Exemption was approved by the NCPA Commission on September 27, 2013 for this class of work and was filed in San Joaquin County.

The Air District will review if the change represents a Federal Major Modification and will determine if it is subject to Best Available Control Technology. Adverse determination from the Air District may impact the overall schedule of this project, potentially delaying it by 2.5 - 4 months.

The California Energy Commission has not provided guidance, but recognize that no Conditions for Certification will be modified.

Submitted by:

Joel Ledesma Assistant General Manager Generation Services

LEC Options Status

NCPA

•Recommend Option 3

Option	Description	Status	Siemens Cost
1	Rebuild to Original Specifications	June 30, 2020	\$39,150,653
2	Rebuild with Hybrid Rotor	September 2020*	~same as #1
3	Replace with F4 Machine	June 30, 2020*	\$39,150,653
4	Replace with 5ee Machine	12+ Months	Not Priced

•Air Permitting is schedule risk

Scope

- New F4 Machine (reuse existing combustion parts)
- Application of Service Bulletins
- New hardware (hydraulic skid)
- Transportation
- Installation (including modifications)
- Commissioning
- Removal of old parts

Permits

- Air District
 - BACT Analysis
 - Federal Major Mod?
 - Risk 2.5-4 months
 - Public comment period
 - Allowed Start date to "construct"
 - Apply for expedited review
 - Must submit application to get answer

Permits

CEC

- No answer at this time
- Not expected to be problem
 - No permit conditions need changed
- Expect them to review foundation calcs

Engineering Review

- Foundation
 - 17% increase in weight
 - Reviewed
 - Torque-no change
 - Unbalance force-within original design
 - Blade loss force-decreased
 - Static deflection-same
 - Natural frequency-same
 - Acceptable for machine
- Other
 - No findings

LTA

- New machine more expensive to service
- Reduce 1 Major
- Keep same term
- Funding Balance on Account
 - Hold Variable Rate Flat
 - Upgrade to ULN combustors next outage
 - 45% Hydrogen
 - Reduced Ammonia, extend Catalyst, Reduce HRSG Maint
 - Purge Credit
 - Faster Startup
 - Reduced wear on torque converter

Cost Table and Funding

PA

Description	Cost
Siemens Scope	\$39,150,653
Sales Tax	~\$3,349,347
Support (Crane, Scaffold, Insulation, etc)	~\$3,000,000
Incidentals (Permitting)	~\$300,000
Contingency	\$5,000,000
Total	~\$50,800,000
Source	Amount
Insurance	\$50,000,000
Deductible	\$500,000
Additional Funding	\$300,000

Deductible and Additional Funding to come from maintenance reserve. Future budgets will be increased by \$200,000 for four years to replenish.

Recommendation

Staff recommends that the Lodi Energy Center Project Participant Committee approve Lodi Energy Center Turbine Restoration Project Option #3 (New F4 Machine) in an amount not-to-exceed \$50,800,000; and authorize the NCPA General Manager to execute agreements, including revisions to the Long Term Maintenance Agreement, and issue Purchase Orders to carry out that work. Funding will come from insurance coverage and LEC's Maintenance Reserve account. The Maintenance Reserve will be replenished over four years in future budget years, beginning with FY21.





Lodi Energy Center Transformer Replacement Project – Request for Additional Funds

Jeremy Lawson Director of Engineering February 19, 2020

Contents

CPA

- Background
- Current Status
 - Contracts
 - Budget
 - Manufacturing
 - Assembly
- Schedule
- Environmental Analysis
- Recommendation



LEC Steam Turbine Transformer installation in 2012

Background

Project Approval

- June 27, 2019 The Lodi Energy Center Transformer Replacement Project was approved in the Commission Meeting (SR: 169:19; Reso: 19-50), with an initial estimated budget not to exceed \$4.0m
- General Contractor (\$850k)
 - Remove and relocate existing transformer including all high voltage bus duct and overhead conductors, protection and control interconnection, and commissioning
 - December 19, 2019 NCPA received 2 bids
 - Costa Electric (\$826k)
 - Siemens Energy, Inc. (\$889k)
 - Contra Costa was lowest bid and determined to be the best value.



Current Status – Budget

Budgeted		
Budget, Transformer FY2020	\$2,915,858	
Budget, Reallocated Funds, Transmission Upgrade Project	\$1,084,142	
Total Budgeted	\$4,000,000	
Current Cost		
Transformer Manufacturing	(\$2,919,480)	
Engineering (Civil, Electrical Interconnection/Protection)	(\$238,000)	
Transformer Bus Duct Adapter	(\$64,995)	
Engineering (Transformer Quality Assurance)	(\$95,500)	Note #1
Hazardous Material Management	(\$12,650)	
Total Current Cost	(\$3,330,625)	Budget augmentati
Total Current Balance	\$669,375	driver: initial estima
		\$500,000
Estimated Forecasted Costs		
Construction, Bid Results	(\$850,000)	
CBO Plan Review	(\$20,000)	Note #2
Construction Contingency (26.4% of Construction Bid)	(\$224,374.75)	Below initial propos
Total Estimated Forecasted Costs	(\$1,094,375)	of \$4 8m
Estimated Total Cost (Current + Forecast)	(\$4,425,000)	
		-
Recommended Budget Augmentation	(\$425,000)	

Current Status - Manufacturing

Quality checks were compliant.

ICPA

 All checks were made after the sizing process was completed and the coils came out of the oven.







Current Status - Assembly



NCPA



Assembled core and coils mounted to tank lid



LV bushing connections



Current Status - Assembly

NCPA



"Tanking" - Inserting core and coil into tank

Core mounts



Tank



Tap Changer



ANCPA



Environmental Analysis

- These activities are categorically exempt under Class 1 and 2 from the provisions of the California Environmental Quality Act pursuant to Section 15301 (b) and 15302 (c) of the CEQA Guidelines.
- A Notice of Exemption was approved by the NCPA Commission on September 27, 2013 for this class of work and was filed in San Joaquin.

Recommendation

- NCPA staff is recommending that the LEC PPC approve additional funds for the LEC Transformer Project, increasing the total project not to exceed amount from \$4,000,000 to \$4,425,000,
- and delegating authority to the General Manager or his designee to award bids, execute agreements, and issue purchase orders for the updated project amount,
- and authorize the use of up to \$425,000 from the LEC Maintenance Reserve Fund, and acknowledging that the LEC Maintenance Reserve Fund will need to be replenished in future budget years.

Questions / Answers

CPA

Extra - Background

- LEC Combustion Turbine (CT) Generator Step-Up (GSU)
 - 230MVA, 230kV
 - MFG: Areva –> Alstom –> GE
- First inspection in 2013
 - Internal inspection, No findings
 - No evidence of physical damage
 - Recommendation: Monitor
- Second inspection in 2018
 - Increasing levels of gasses
 - Physical shifting of internal core
 - All electrical tests passed, except bushing Doble test
 - Recommendation: Replace

Note: gas turbine capacity, impact considered





These 2nd inspection pictures show core movement.

Extra - Background

- Initial bid scope engineering, procurement and construction bid
 - November, 2018 Invited transformer replacement bids
 - December, 2018 11 bidders joined bid walk
 - January, 2019 1 responsive bid, cost too high, +\$4.8m
- Revised bid scope transformer only (~procurement only)
 - February, 2019 Invited revised transformer only bids
 - April, 2019 2 bids received, Siemens won bid at \$2.9m
- Project Approval
 - June 27, 2019 The Lodi Energy Center Transformer Replacement Project was approved in the Commission Meeting (SR: 169:19; Reso: 19-50), with an initial estimated budget not to exceed \$4.0m

Extra Current Status – Contracts

- Engineering and construction in place
 - Engineering (Worley Parsons \$238k)
 - electrical, civil, project management, and general construction bid review
 - Quality Assurance and Manufacturing Inspection (VPF Transformer Consulting \$95k)
 - reviewing transformer manufacturing standard compliance, onsite witness acceptance testing review, and specification completeness checking
 - Isophase Bus Duct Work (Powell Industries \$65k)
 - providing bus duct system adapters
 - Hazardous Material Management (In Process, ACT \$13k)
 - Waste management of ~14k gallons of oil and support oil containment during disassembly of existing transformer
- Regulatory/Other Agency Involvement (\$20k)
 - CAISO (USE Consultants) Queue Management process for new transformers and BPM Section 10 data requirement updates
 - CEC (WC3) Delegated Chief Building Officer (DCBO)
 - PGE Process PGE's energization and interconnection procedure (DG5), provides OK to connect

Extra Current Status – Contracts

- General Contractor (In Process, Contra Costa, \$850k)
 - Remove and relocate existing transformer including all high voltage bus duct and overhead conductors, protection and control interconnection, and commissioning
 - On October 31, 2019, NCPA released a Notice Inviting Bids for the installation portion of the Transformer Replacement Project.
 - November 21, 2019 A bid walk took place on, and 3 potential bidders attended.
 - December 19, 2019 NCPA received 2 bids.
 - Costa Electric (\$826k)
 - Siemens Energy, Inc. (\$889k)
 - Contra Costa was lowest bid and determined to be the best value.

Extra Current Status - Manufacturing

LV phases

СРА

- The LV winding is a made of a helical winding containing 68 turns.
- The copper conductor is made of 6 Continuous Transposed Conductors (CTC) cables, 3 axial and 2 radial bonded CTC using 53 strands.
- Measurement of the CTC was confirmed.
- The winding conductor covering is nylon netting with enamel on conductor and was confirmed.
- The yield strength of the copper was confirmed.
- The inner diameter, outer diameter and winding height were checked. Magnet test to ensure no metallic particles were inside the windings.
- Quality checks were compliant.
- All checks were made after the sizing process was completed and the coils came out of the oven.







Extra Current Status -Manufacturing

HV phases

CPA

- The HV winding is a top fed disk winding, using 88 sections and 6 turn/disk.
- The maximum number of turns is 519 turns. There are wound in shields at the line ends at the top of the winding.
- The copper conductor is 1 bonded CTC 27 strands with 43 mil thermally upgraded paper insulation.
- Additionally, in order to control voltage stresses, Siemens uses wound in shields at the line end of the HV winding.
- The yield strength of the copper was confirmed.
- The inner diameter, outer diameter and winding height were checked. Magnet test to ensure no metallic particles were inside the windings.
- Quality checks were compliant.
- All checks were made after the sizing process was completed and the coils came out of the oven.



Extra Current Status -Manufacturing

HV DETC phases

ICPA

- De-Energized Tap Changing (DETC) windings
- The HV tap winding is a loop layer winding, using 4 groups with 14 turns per tap.
- The maximum number of turns is 56 turns. The copper conductor is 1 radial x 2 axial Bonded CTC 13 with 51 mil thermally upgraded paper insulation.
- The yield strength of the copper was confirmed.
- The inner diameter, outer diameter and winding height were checked. Magnet test to ensure no metallic particles were inside the windings.
- Quality checks were compliant.
- All checks were made after the sizing process was completed and the coils came out of the oven.





Lodi Energy Center Project Participant Committee

Staff Report

AGENDA ITEM NO .: 04

Date:	February 18, 2020
Meeting D	ate: February 19, 2020
То:	Lodi Energy Center Project Participant Committee
Subject:	Lodi Energy Center Transformer Replacement Project Request for Additional Funds

Proposal

Approve additional funds for the Lodi Energy Center Transformer Project, increasing the total not to exceed amount of this project from \$4,000,000 to \$4,425,000, delegating authority to the General Manager or his designee to award bids, execute agreements, and issue purchase orders for the updated project amount, authorize the use of up to \$425,000 from the LEC Maintenance Reserve Fund, and acknowledging that the LEC Maintenance Reserve Fund will need to be replenished in future budget years.

Background

In 2013, NCPA staff first identified elevated values of gasses in the LEC generator step-up transformer. An internal inspection resulted in no findings or physical damage, and the transformer was placed back into service. In 2018, NCPA staff identified another rise in elevated values of gasses. An internal inspection was completed during which physical damage was found, and it was determined that the generator step-up transformer was failing and would need to be replaced.

The Lodi Energy Center Transformer Replacement Project was approved in the June 27, 2019 Commission Meeting (SR: 169:19; Reso: 19-50), with a budget of not to exceed \$4,000,000. After completing competitive bidding, a contract was awarded to Siemens Energy for acquisition of the transformer equipment portion of the project. Based on current estimated costs and actual bid responses for the general construction portion of this project, the new forecasted total budget is \$4,425,000. Staff is recommending authorizing the use of up to \$425,000 from the LEC Maintenance Reserve Fund for the increased project cost.

Selection Process

On October 31, 2019, NCPA released a Notice Inviting Bids for the installation portion of the Transformer Replacement Project. NCPA received bids from Contra Costa Electric and Siemens Energy. Contra Costa submitted the lowest responsive bid.

NCPA estimates a cost savings of about \$400,000 by utilizing a separate bid process for the procurement of the equipment and procurement for its installation.

Fiscal Impact

The LEC Transformer Replacement Project was considered and approved in the FY20 budget for \$4,000,000. The funds will come from three sources, as show in the table below:

Budgeted	
Budget, Transformer FY2020	\$2,915,858
Budget, Reallocated Funds, Transmission Upgrade Project	\$1,084,142
LEC Maintenance Reserve Fund	\$425,000
Total Budgeted	\$4,425,000
Current Cost	
Transformer Manufacturing	(\$2,919,480)
Engineering (Civil, Electrical Interconnection/Protection)	(\$238,000)
Transformer Bus Duct Adapter	(\$64,995)
Engineering (Transformer Quality Assurance)	(\$95,500)
Hazardous Material Management	(\$12,650)
Total Current Cost	(\$3,330,625)
Total Current Balance	\$669,375
Estimated Forecasted Costs	
Installation, Bid Results	(\$850,000)
CBO Plan Review	(\$20,000)
Installation Contingency (26.4% of Installation Bid)	(\$224,374.75)
Total Estimated Forecasted Costs	(\$1,094,375)
Estimated Total Cost (Current + Forecast)	(\$4,425,000)

Environmental Analysis

These activities are categorically exempt under Class 1 and 2 from the provisions of the California Environmental Quality Act pursuant to Section 15301 (b) and 15302 (c) of the CEQA Guidelines. A Notice of Exemption was approved by the NCPA Commission on September 27, 2013 for this class of work and was filed in San Joaquin County.

Lodi Energy Center Transformer Replacement Project Request for Additional Funds February 19, 2020 Page 2

Recommendation

NCPA staff is recommending that the LEC PPC approve additional funds for the Lodi Energy Center Transformer Project, increasing the total not to exceed amount of this project from \$4,000,000 to \$4,425,000, delegating authority to the General Manager or his designee to award bids, execute agreements, and issue purchase orders for the updated project amount, authorize the use of up to \$425,000 from the LEC Maintenance Reserve Fund, and acknowledging that the LEC Maintenance Reserve Fund will need to be replenished in future budget years.

Submitted by:

JOEL LEDESMA Assistant General Manager Generation Services