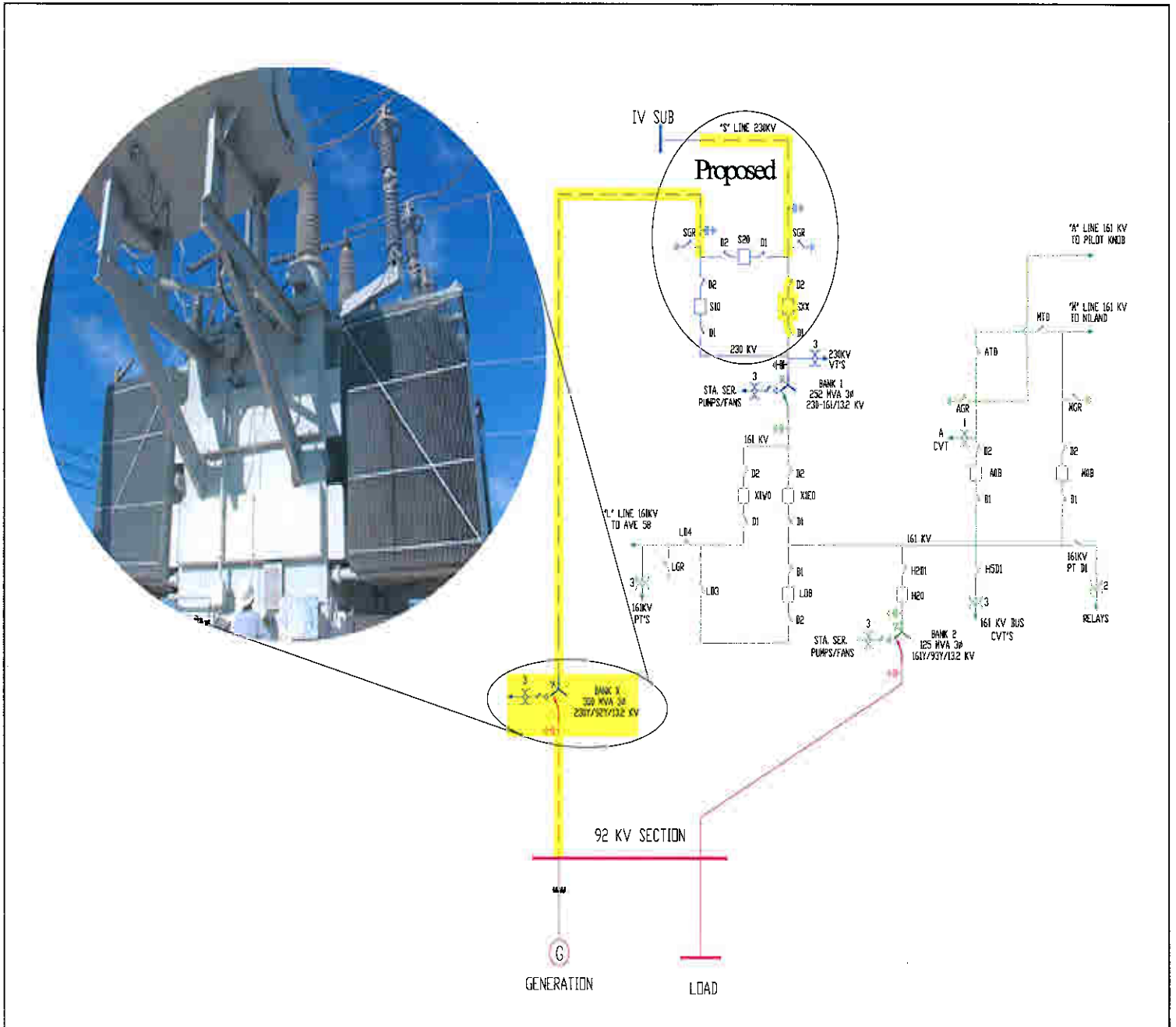




IMPERIAL IRRIGATION DISTRICT ENERGY DEPARTMENT SYSTEM PLANNING



ECSS Bank 4 Project
Major Work Authorization
P-6573
October 24, 2006



MAJOR WORK AUTHORIZATION
ECSS Bank 4 Project

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MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

INTRODUCTION

The information contained in this document outlines the design and installation of a 230/92kV, 300MVA transformer (Bank 4) at El Centro Switching Station as well as budgetary cost estimates, preliminary project schedule, information on the project team members and a project authorization sign-off sheet.

EXECUTIVE SUMMARY

The ECSS Bank No.4 project consists of installing a new 230/92kV 300MVA transformer at El Centro Switching Station (ECSS). The cost of the project is estimated at \$ 4,585,900.00

Funding for this project has been allocated in the 2006, 2007 and 2008 capital budget. Budget allocation has been reviewed by the Energy Budget Administration. The project team may revise the total funding amount upon design completion and construction unit final review.

The estimated project in service date is November 6, 2008.

PROJECT DESCRIPTION

The ECSS Bank Project (Project Number P-6573) consists of installing a new 230/92kV 300MVA transformer at ECSS.

The project also includes the following:

- Add a new 230kV breaker, to the existing 230kV ring bus to create a new line bay position.
- Switch the existing 230kV "S" line to the new line bay position.
- Modify the protection and control schemes of the vacant "S" line bay position to protect and control the new Bank No.4, 230/92kV transformer.
- Modify the protection and control schemes of the existing 92kV "B" line bay position¹ to protect and control the new 230/92kV transformer. The "B" line bay position will provide interconnection to the 92kV side of the new ECSS Bank No.4 230/92kV transformer.
- Build a temporary 230kV line extension to interconnect the new 230/92kV transformer to the vacant 230kV "S" line bay.
- Install a new protection and control relay panel at the existing 92kV control house² to protect ECSS Bank No.4.

¹ The 92kV "B" line between Drop 4 and ECSS will be cut over to 230kV as part of the IID's Transmission Expansion Plan (TEP). This portion of the TEP will be performed in coordination with ECSS Bank #4 project.

² The Protection and control panel will be designed taking into consideration the final 230kV upgrades related to IID's Transmission Expansion Plan (component of the Green Path) scheduled by 2007-2009 years subject to board authorization.



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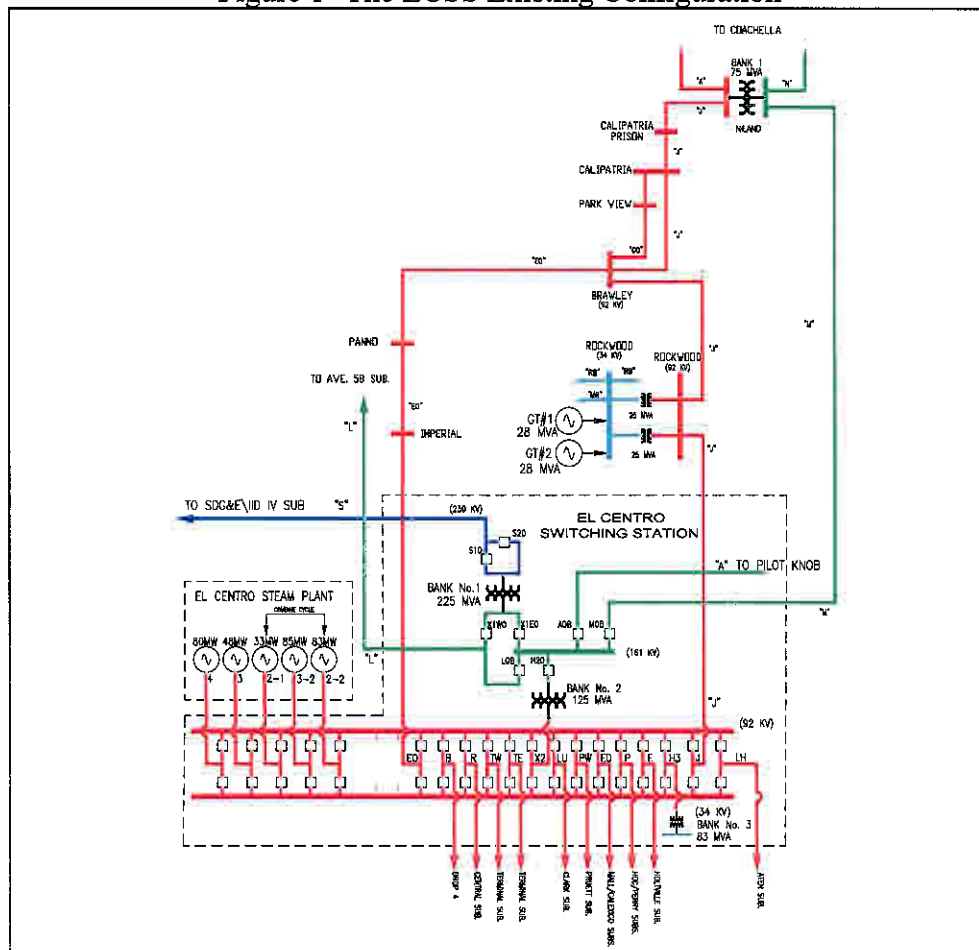
PROJECT JUSTIFICATION

El Centro Switching Station (ECSS) consists of 230kV, 161kV and 92kV bus sections, the 230kV section accommodates the 230kV "S" line to Imperial Valley substation³ and the ECSS Bank No.1 230/161kV 225MVA transformer⁴.

The ECSS 161kV bus provides interconnection to three 161kV lines⁵ and to the ECSS Bank No2 161/92kV, 125MVA transformer.

The ECSS 92kV bus provides interconnection to the ECSS Bank No.2 and to the El Centro Steam Plant generation station (ECSP) that consists of ECU2-1, ECU2-2 (combined cycle), ECU3 and ECU4 with a total of 241.5MW of generation. The ECSS 92kV bus also interconnects to multiple 92kV transmission lines that provide the transmission path to multiple distribution substations in the Imperial Valley service area. The following figure depicts the existing configuration of ECSS.

Figure 1- The ECSS Existing Configuration



³ Imperial Valley Substation is own by SDG&E and IID

⁴ Power purchased by IID delivered through the Imperial Valley Substation is transmitted into IID electrical system through the 230kV "S" line and through the ECSS 230/161kV transformer.

⁵ The "L" line to Ave 58 station, the "M" line to Niland, and the "A" line to Pilot Knob and



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During summer, the majority of the energy consumed by the Imperial Valley service area is served by the El Centro Steam Plant (ECSP) and by the power that flows across the ECSS Bank No.2 161/92kV 125MVA transformer.

The Niland Bank No.1, 161/92kV 75MVA transformer also provides an energy source to the Imperial Valley service area (northern).

System Planning studies indicate that under certain Heavy summer conditions, the outage of ECU2-1,2 combined cycle power plant or the outage of the Niland 161/92kV transformer creates an overload⁶ of the ECSS Bank No.2 161/92 kV 125MVA transformer.

In addition, the System Operation Control Center (SOC) dispatchers under routine bases during heavy summer conditions need to monitor and control the ECSS Bank No.2 loading. The loading of ECSS Bank No.2 is controlled by dispatching generation at ECSP and Gas Turbines at Rockwood generation station.

The ECSS Bank No.4 230/92kV 300MVA transformer will provide step down transformation from the ECSS 230kV Bus to the 92kV Bus, providing a parallel transformation path to the ECSS 230/161kV⁷ and to the 161/92kV transformers. Figure 2 depicts the proposed configuration for ECSS.

The ECSS Bank No.4 will remove the potential overload of the ECSS Bank No.2 161/92kV transformer for the outage of the ECSS U2-1 and 2 and the Niland transformer outage.

The ECSS Bank No.4 will reduce the need to dispatch ECSP generation and Rockwood gas turbines to reduce the thermal overload of the ECSS Bank No.2 creating operation flexibility to acquire less cost generation resources outside of our service area.

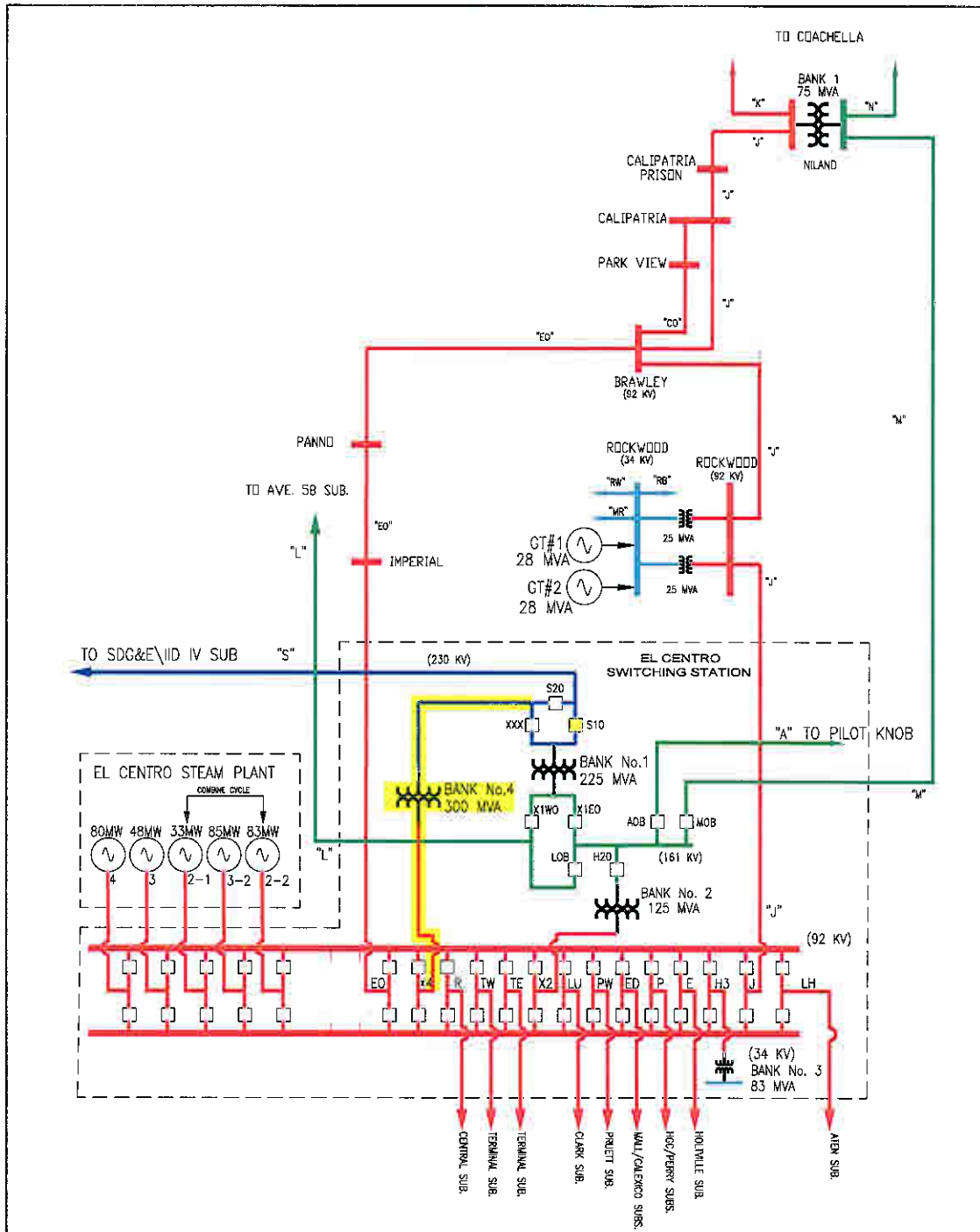
⁶ The magnitude of the overload is maintained within the emergency rating of the transformer, but will be increased due to load growth in the Imperial Valley service area.

⁷ The ECSS Bank No.1 230/161kV will be relocated to Mecca 230kV Station



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Figure 2- The ECSS 230/92KV 300MVA Transformer





MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

PROJECT SCOPE:

1. No acquisition of land is necessary for this project.
2. Obtain the necessary permits (including access) and comply with the environmental requirements.
3. Perform the engineering design as described in the project description of this document. Refer to Figure 2 and Appendix A.
4. Order the necessary equipment and materials for this project. (*Staged materials and equipment ordered for other non-priority projects may be used in this project*).
5. Perform the construction of the project.
6. Complete the project by the in service date of November 6, 2008



MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

REAL ESTATE REQUIREMENTS:

This authorization action is conditioned upon completion of all requirements specified in CEQA. This includes, but is not limited to an environmental assessment, an environmental impact review, or negative impact declaration. No property acquisition, right-of-way acquisition, or award of contracts for construction will be finalized until all requirements are complete.

ENVIRONMENTAL COMPLIANCE:

This authorization action is conditioned on completion, prior to commencement of work, of all requirements specified in the California Environmental Quality Act (CEQA), the Endangered Species Act (ESA) or other applicable environmental or wildlife resource laws. IID's Environmental Compliance Section (ECS) will review any of the proponent's environmental documentation to determine compliance with existing environmental regulations.



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PROJECT FINANCING/ACCOUNTING

Project's Funding Source: Energy Revenues

Funding for this project has been allocated in the 2006, 2007 and 2008 Capital Budget and reviewed by the Energy Budget Administration.

The project cost has been estimated at \$4,585,900.00 Included in the total cost is \$416,900.00 for contingencies⁸.

The project team will revise the total funding amount upon design completion and construction unit final review.

Estimated Summary of Probable Costs is as:

IID Engineering Services (Design)

Substation	\$	50,000.00	+
Relays	\$	14,000.00	
Transmission	\$	9,000.00	
Distribution	\$	-	
Communication & SCADA	\$	4,000.00	
	\$	<u>77,000.00</u>	

Equipment and Material

Substation	\$	3,320,000.00	+
Relays	\$	180,000.00	
Transmission	\$	100,000.00	
Distribution	\$	-	
Communication & SCADA	\$	20,000.00	
	\$	<u>3,620,000.00</u>	

Substation Exterior Work

Wall Fence (South Side)	\$	40,000.00	+
Grading	\$	20,000.00	
Road Base	\$	-	
Concrete (Foundations)	\$	-	
Landscaping	\$	-	
	\$	<u>60,000.00</u>	

⁸ Project contingency is 10%



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Construction Labor

Substation	\$	276,000.00	+
Relays	\$	17,000.00	
Transmission	\$	89,000.00	
Distribution	\$	-	
Communication & SCADA	\$	10,000.00	
	\$	<u>392,000.00</u>	

Operational Resources

Real Estate	\$	-	+
Environmental	\$	7,000.00	
	\$	<u>7,000.00</u>	

Administrative Cost

Transmission Plannig	\$	4,000.00	+
Distribution Planning	\$	-	
Project Management	\$	9,000.00	
	\$	<u>13,000.00</u>	

Project Cost Estimate	Subtotal	\$	4,169,000.00	+
	Contingency 10 %	\$	416,900.00	
	Grand Total	\$	<u>4,585,900.00</u>	

Transferred Material from Staged Inventory \$ -

Total to Fund This Project \$ **4,585,900.00**



MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

COST-BENEFIT ANALYSIS AND RISK ASSESSMENT

OVERVIEW

The project to install the 230/92kV, 300MVA Bank No.4 at ECSS will upgrade the power transfer capacity from the 230kV bus to the 92kV bus. The project entails the engineering, equipment/materials and construction costs to improve the system on one of the most important points in the District's electrical grid. The in-service date for this project is anticipated to be November 6, 2008.

ASSUMPTIONS

Assumptions used for the cost-benefit analysis were based on information of previous and forecasted summer peaks scenarios as well as data received from the power system operation section. Part of the intent of the cost-benefit analysis and risk assessment is to assess the reasonableness of the data and the methodology used in constructing the model. It is outside the scope of this analysis to validate all of the underlying data. Specific assumptions used in this cost-benefit analysis include:

- Loss of the El Centro # 2 generator (approximately 115MW) will result in 110 % loading on the ECSS 161/92kV 125MVA Bank. Thus, will result in the need to dispatch gas turbines for a period of nine hours per day for sixty days. The gas turbines hourly cost was calculated by summing the fuel, auxiliary energy and variable O&M costs for each unit. The incremental cost between external and internal energy costs was used. The incremental cost was further reduced to 33% of the total to offer a more conservative figure.
- The cost of cold starting the gas turbines for sixty days was also reduced to a more conservative 33% figure.
- Corrective and preventive maintenance to the existing 161/92kV, 125MVA transformer were considered to be done on seasons when a schedule outage can be implemented without causing the utilization of the gas turbines.
- The proposed transformer bank is estimated to have a useful life of 34 years.
- An interest rate of 5% was used to calculate the project's funding cost. No adjustments were made to predict the variability of this rate over the useful life of this project.
- A discount or hurdle rate of 5.5% was used in this analysis.



MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

PROJECT COSTS AND BENEFITS

The estimated cost for this project is \$4,585,900.00 funding for this project will be allocated in the 2006, 2007 and 2008 capital budget, and reviewed by the Energy budget Administration. A 10% reserve is included in the estimate to handle contingencies and other unanticipated costs.

The primary benefit of this project is the avoided incremental cost of internal versus external energy and the gas turbine startup costs required to replace the generation in the event that a combination of loss and/or reduction of generation at the ECSS steam plant units representing a total approximately of 115MW occur. Other than project costs and the cost to fund the project, no other costs were identified.

PROJECT FINANCIAL METRICS

A cost-benefit analysis was completed on this project using a spreadsheet modeled for the evaluation of reliability projects. Based on the assumptions previously defined, the following table highlights the financial metrics resulting from the cost-benefit analysis:

FINANCIAL METRIC	RESULT
Net Present Value (NPV)	\$3,357,242
Internal Rate of Return (IRR)	11 %
Estimated Payback Period	10 years
Return on Investment (ROI) Simple	152 %
Discounted	50%

The full cost-benefit spreadsheet has not been included in the MWA but is available if the reader desires additional information related to these results.

RISK ASSESSMENT

As previously stated this project is anticipated to increase the District's power capacity, and increase system reliability. Besides the benefit of overall system reliability, there will be economic benefits as well. The basic premise is that the planned system upgrades would reduce the dependence on running high cost generation units upon contingencies on ECSS steam plant generation units, especially on summer peak season.

"Estimated probable costs" were summarized in the Project Financing/Accounting section and a high-level project schedule was included in the appendices of the MWA. Project costs are preliminary in this stage of the project. Detailed design has not been completed. Therefore, contingency costs, equal to 10% of the total preliminary estimated costs, have been included to minimize the risk of project cost over-runs.

Not doing the project will have the IID grid at risk to be gradually constrained, especially at the time of the system peak demand.



**MAJOR WORK AUTHORIZATION
ECSS Bank 4 Project**

PROJECT TEAM

Chief Financial Officer.....	Robert J. Vodzack
Department Manager.....	John Federowicz
Assit. Manager Project Owner.....	J. C. Sandoval
System Planning Project Owner.....	D. L. Barajas


Project Leads:

Project Planning Engineer.....	Jorge Barrientos
Project Manager.....	Eddie Lutz
Project Engineer (T & S).....	Oscar Kebriti
Project Engineer (Telecom).....	Javier Jimenez
Project Management Coordinator.....	Walter Gonzalez
Project Substation Construction/Inspection.....	Al Minor
Project Budget Coordinator.....	Corina Jaramillo
Project Siting	Eddie Villanueva
Environmental Compliance	Mike Remington
Real Estate	Jim Kelley



MAJOR WORK AUTHORIZATION
ECSS Bank 4 Project


PROJECT AUTHORIZATION
SIGN-OFF SHEET




Manager, Energy Department 10/17/06
Date



Chief Financial Officer 10/18/06
Date



General Manager 10.24.06
Date

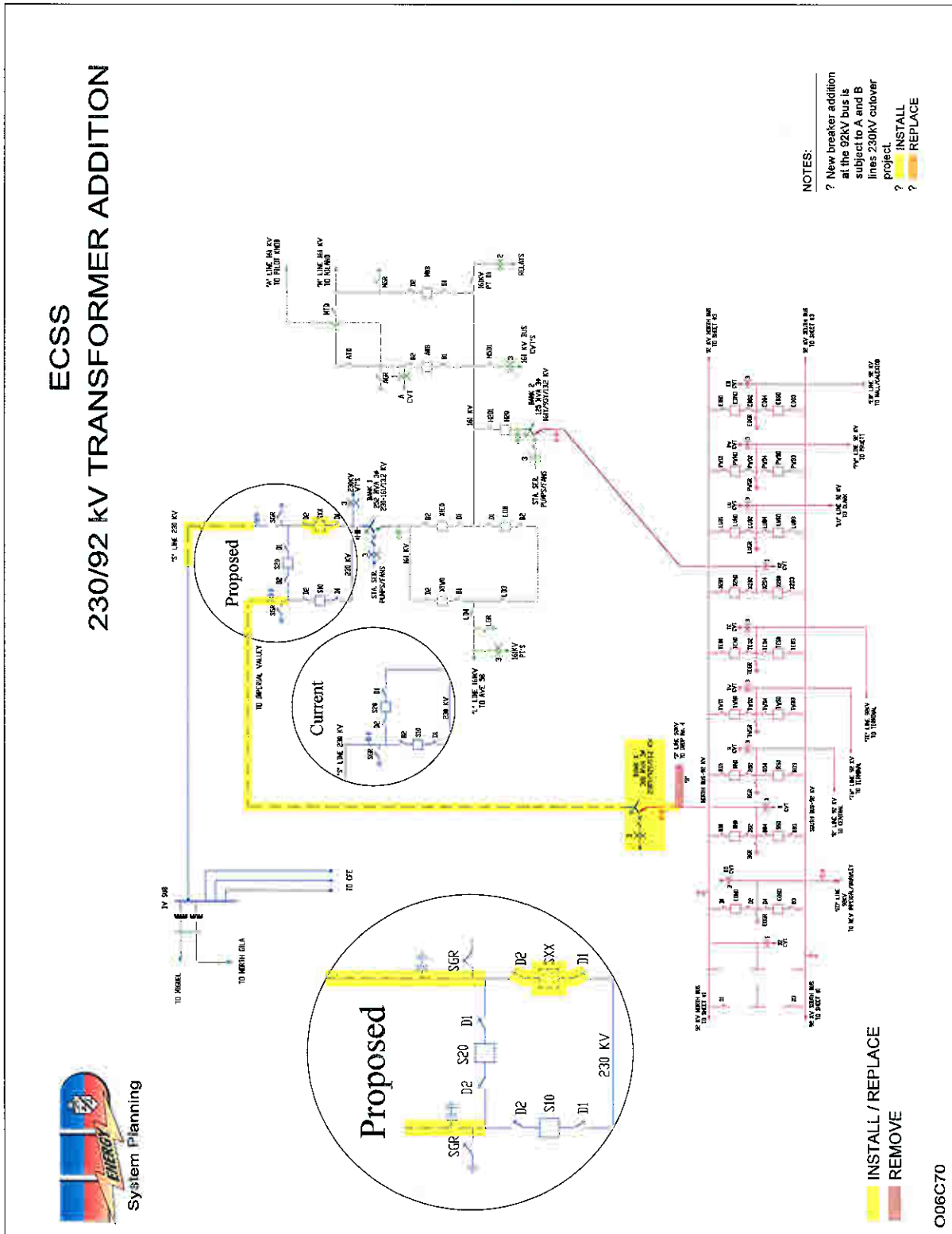


President, Board of Directors 10-24-06
Date



MAJOR WORK AUTHORIZATION ECSS Bank 4 Project

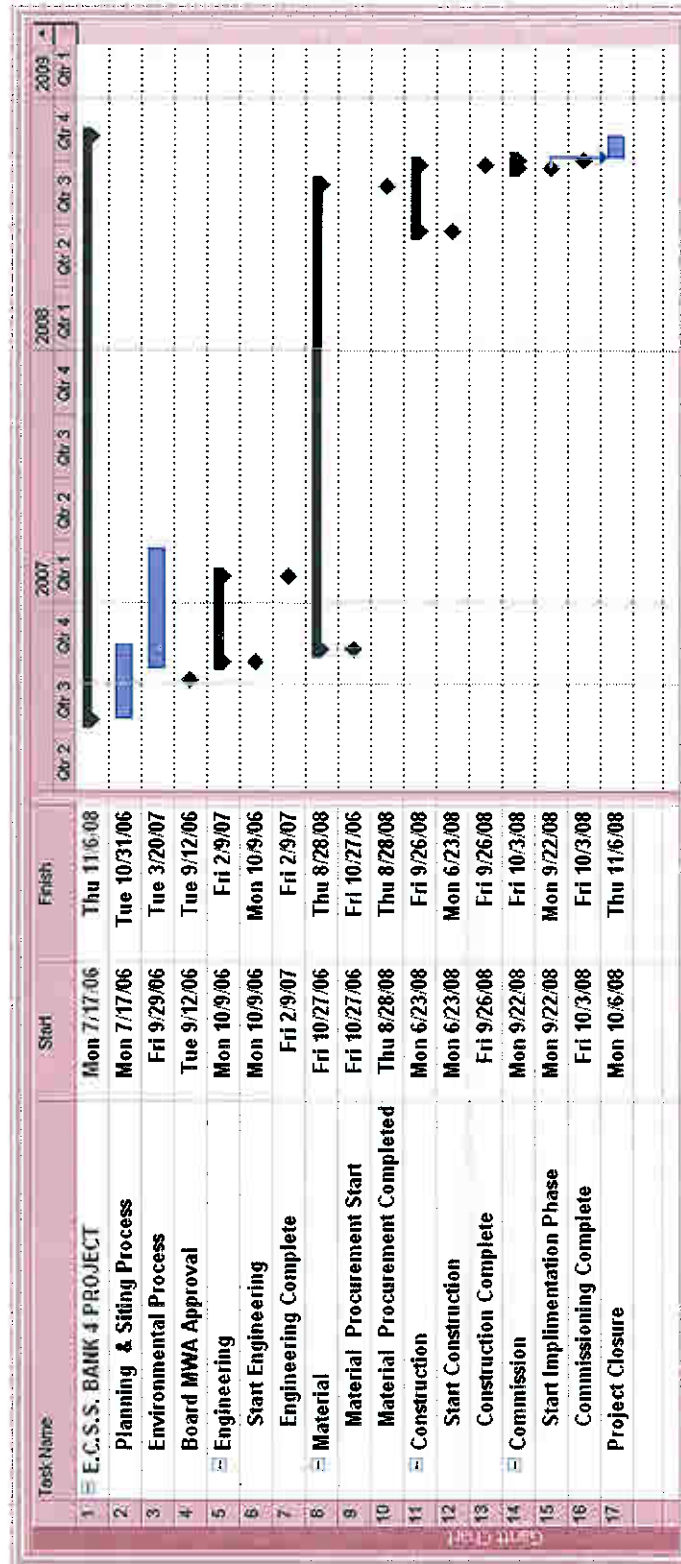
Appendix A – One-Line Diagram Proposed Conditions





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Appendix B – Project Schedule



IMPERIAL IRRIGATION DISTRICT
Electric System

Summary of Proposed Five Year Capital Plan (\$000)
Electric Transmission

Line No.	Project	Fiscal Year Ending December 31						Total	
		2006 (I)	2007	2008	2009	2010	2011		2012
37	Heber-Imperial								2,167
38	Mecca-Oasis (to "R" line double circuit)	500	60	1,697					4,100
	Mecca 230-kV Line	200	500	3,400					7,740
	Avenue 58 (xfmr addition)		100	1,000	6,640				3,600
	Coachella Valley Sub Addition			100	3,500	4,364			5,459
39	Sub Total Existing Substations/Transmission	9,690	16,118	13,217	32,409	14,767			86,201
Substation Capacitor Banks/Breaker Upgrade									
40	Pilot Knob Breaker	100	308						408
41	Capacitor Banks 92-kV Network, Ave 42	804							804
42	Capacitor Banks 92-kV Network, Ave 58	804							804
43	El Centro Switching Station Breaker	389							389
44	Ave 48 Feeder Breaker replacement		500						500
45	Ave. 52 Bank 2 Addition		50	2,450					2,500
46	Carreon Bank 2 Addition		50	2,450					2,500
47	Subst. Feeder Getaways			10,575	14,550	7,400			32,525
48	East Mesa I - H10 circuit breaker		180						180
49	ECSS 230/92-kv Transformer Addition		1,000	3,186					4,586
50	Francis Way Bank 2 Addition		50	2,450					2,500
51	Mecca Bank 2 Addition		2,320						2,320
52	Monroe Bank 2 Addition		50	2,450					2,500
53	Van Buren Feeder Breaker Replacement		500						500
54	Coachella Switching Station New 92-kV bay			300					300
55	Sky Valley Bank 2 Addition		180						180
56	Terminal, Cap Bank, El Centro	867							867
57	El Centro Switching Station-New 230 kv Bus	300							300
58	El Centro Switching Station-161 kv Modifice	200							200
59	Sub Total Substation Capacitor Banks/Breaker	3,463	5,408	24,041	16,870	7,400			57,182
Transmission Line Extensions/Upgrades									
60	Transmission Line Expansion (Greenpath)		2,300	1,000					3,300
61	IID IV Sub Phase Shifter			1,820					1,820
62	San Felipe Sw/Station (IID's portion)				1,700	6,800			8,500
63	IV-San Felipe 500-kV (IID's portion)				2,140	8,560			10,700
64	A and B Line Conversion to 230-kV				11,000				20,900
65	KN/KS Line (Midway to CV)	500	168	9,800					8,500
66	KN/KS Cathodic Protection (Highline-Midw)		1,000	7,000					600
67	Coachella Valley KS Line Swap		600						275
68	"L" Line 230-kV Cutover (ECSS-Mecca 230)		50	22	858	45,842			44,750
69	"CE" Line		50						50
70	Sub Total Transmission Line Extensions/Upg	600	4,253	19,643	15,698	59,202			99,395