

**ORIGINAL**

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AZ CORP COMMISSION  
DOCKET CONTROL

January 28, 2010

**VIA OVERNIGHT DELIVERY**

Arizona Corporation Commission  
Docket Control, Room 108  
1200 West Washington Street  
Phoenix, Arizona 85007

Re: 10-YEAR TRANSMISSION PLAN-2010  
Docket No. E-00000D-09-0020

Gentlemen:

Enclosed please find an original and 13 copies of the 10-Year Transmission Plan-2010 for Gila Bend Power Partners, LLC. The project is on hold due to current market conditions, so the plan has not been revised since Gila Bend's prior submission.

If you need anything further, please let me know.

Yours truly,



HEATHER KREAGER

HK:ags

Arizona Corporation Commission  
**DOCKETED**

JAN 29 2010

DOCKETED BY 

**GILA BEND POWER PARTNERS, LLC**

**5949 Sherry Lane, Suite 1900**

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January 28, 2010

Arizona Corporation Commission  
Docket Control, Room 108  
1200 West Washington Street  
Phoenix, Arizona 85007

Re: Transmission Line 10-year Plan – 2010  
Docket No. E-00000D-09-0020

Gentlemen:

Gila Bend Power Partners, LLC is planning to build a 500KV Transmission line and related switchyard as part of the Gila Bend Power Project (GBPP); CEC Case 106, (approved 4/12/2001 – extended 4/11/2011), CEC Case 109 (approved 6/12/01 – extended through 4/11/11), and CEC Case 119 (approved 4/25/03 – extension request pending). (See attached interconnection diagram, Exhibit 1 and route map, Exhibit 2).

The following, as per A.R.S. 40-360.02, outlines the 10-year plan for 500KV transmission lines and related switchyard:

The 500kV transmission line will run from the GBPP site, in the northwest corner of Gila Bend along Watermelon Road to a new switchyard approximately one quarter mile east of Arizona State Highway, Route 85. (See attached interconnection diagram, Exhibit 2 and route map, Exhibit 3). At the new Switchyard, referred to as Watermelon Switchyard, the 500kV transmission line will interconnect with the Arizona Public Service Gila River Line, which connects the Watermelon Switchyard to the Jojoba Switchyard.

Case 109: The 500kV transmission line will run from the GBPP site, in the northwest corner of Gila Bend along Watermelon Road to a new switchyard approximately one quarter mile east of Arizona State Highway, Route 85. At the new switchyard, referred to as the Watermelon Switchyard, the 500kV transmission line will interconnect with the Arizona

Public Service Gila River Line, which connects the Watermelon Switchyard to the Jojoba Switchyard.

Case 119: The 500kV transmission line will be constructed from the Jojoba Switchyard to the Hassayampa Switchyard. The line will be constructed in an established BLM Transmission corridor, adjacent to the existing Kyrene line and the Palo Verde to Pinal West line currently under construction. The 500kV transmission line will interconnect at the Hassayampa Switchyard.

The GBPP and related transmission system were included in the 2002 Biennial Transmission Assessment dated December 2002, the Report on the "Preliminary Study for the Palo Verde Interconnection", dated March 2, 2001, version (i), as well as the Report on Phase I Study of the Central Arizona Transmission System (CATS), dated July 20, 2001.

The attached Exhibit I entitled Report on "The Gila Bend Power Partners, LLC's Generation Project System Impact Study" was prepared by James C. Hsu of Salt River Project to demonstrate flow and stability at the Watermelon Switchyard point of interconnection for the GBPP transmission line.

Respectfully submitted,



HEATHER KREAGER

147100 – 10 year Plan

# **GILA BEND POWER PROJECT**

## **2010 10-YEAR TRANSMISSION PLAN**

**Prepared for the:**

**ARIZONA CORPORATION COMMISSION  
UTILITY DIVISION**

**BY: GILA BEND POWER PARTNERS, LLC**

**Report on the Gila Bend Power Partners, LLC.'s  
Generation Project System Impact Study**

**Prepared For the  
Industrial Power Technology  
And  
Palo Verde E & O Committee**

**By  
James C. Hsu  
Salt River Project**

**November 1, 2001**

**Version (C)**

# Gila Bend Power Partners Generation Project

## System Impact Study Report

### I. Introduction

Industrial Power Technology (IPT), on behalf of the Gila Bend Power Partners, LLC (GBPP) has requested Salt River Project (SRP) to perform a system impact study that will assist GBPP in the determination of the Palo Verde transmission system and the WSCC interconnected system impact of interconnecting the proposed GBPP Generation Project with the another proposed Panda Gila River Generation Project's planned Gila River-Jojoba 500 kV double circuit lines. These double circuit 500 kV lines will be tied to the existing Hassayampa-Kyrene 500 kV line. Currently, GBPP has proposed to build a combined cycle power plant of 833 MW in addition to the 2080 MW of new generation power plant proposed by the Gila River Panda Project (Panda) in the same vicinity. In response to this request, SRP has carried out the study work accordingly, and documented the study results in this brief report.

For this analysis, the proposed size of the GBPP project was assumed to be 833 MW. Coincident with the development of the GBPP project, a separate generation proposal called the Gila River Panda Project (2080 MW) is also being developed and it will be interconnected to the Palo Verde transmission system via a double circuit 500kV line from the Gila River generation site to Jojoba, a new switchyard that is being developed to interconnect the two 500kV lines with the existing Palo Verde - Kyrene 500kV line. The GBPP project will interconnect with the system via a new, single circuit 500kV line to Watermelon substation, a new switchyard the GBPP plans to build, located approximately 2 miles from the Gila River Power facility. The Gila River - Jojoba 500kV lines will be looped into the Watermelon switchyard. SRP's system analysis assessed the system impact of both the Gila River Panda and GBPP generation projects on the interconnected WSCC system.

SRP's analysis focused on the capability of the Palo Verde area transmission system to deliver a total of 2913 MW of new generation from both proposed projects (GBPP and Gila River Panda) into the interconnected system. The scope of the study was to identify any significant system impacts that may be caused by interconnecting the GBPP generation project with the Jojoba-Gila River double circuit 500 kV lines, the Hassayampa-Kyrene 500 kV line, and their associated switchyards. This study did not identify any mitigation measures that may be required as a result of system impacts attributable to the GBPP Generation Project. Therefore, neither a preliminary plan of service nor a cost estimate for interconnecting the Proposed Generation Project with the existing and planned 500 kV transmission system was provided.

The purpose of this System Study was to assess the impact of the GBPP project on the Palo Verde transmission and the integrated WSCC EHV transmission system. The study is comprised of limited power flow and stability studies, but does not include any short circuit, post-transient power flow or subsynchronous resonance studies. Any conclusions presented from this System Impact Study represent the opinion of SRP and not necessarily the opinion of the Palo Verde Transmission System Engineering and Operating Committee.

The following two transmission configurations were assessed in this analysis:

**Configuration 1:**

The GBPP Project will be interconnected to the planned Jojoba-Gila River 500 double circuit lines at a location approximately 2 miles from the Gila River 500 kV switchyard (Watermelon substation). This transmission configuration assumed that the Gila River Generating Project would install a 500/230 kV transformer at their Gila River substation to accommodate an interconnection of the existing Liberty-Gila Bend 230 kV line.

**Configuration 2:**

Configuration 2 represents the same 500 kV transmission configuration as Configuration 1, however, the 500/230 kV transformer at the Gila River 500kV substation was not modeled.

**II. Review of Panda System Development and Pertinent Study Results**

Included in the "Report on the Preliminary Study For the Palo Verde Interconnection" and "Report on the Panda Generation Project Sensitivity Study", some technical study results pertinent to the Panda Generation Project and the impact assessment of its system development were documented in a number of different sections throughout these reports. It should be pointed out that these study results varied depending upon the system conditions, system models and the Panda's transmission network used in those studies. The following table summarizes the study results, associated information, and specific references from these reports.

New Generation Accommodated	Panda Interconnection To Palo Verde	Panda 500/230 KV Transformer	Transmission Constraint	Reference
4,850 MW (Including Panda 1250 MW & PDE 550 MW GEN)	Panda Project Looping in & out of PV-KY line	No	Thermal and Stability	PV Interconnection Study Report Section III.B2 (Pg.27) Exhibit 2
5,240 MW (Including Panda 1640 MW & PDE 550 MW GEN)	Building Jojoba-Panda 500 KV double circuit lines and Jojoba cutting into PV-Kyrene line	Yes (with 390 MW flow)	Thermal and Stability	Panda Project Sensitivity Study Report Section III.1&2 (Pg.4) Tables PF-7 & TS-15

These previous study results revealed the following observations:

1. For the 2003 heavy summer condition with the addition of Palo Verde-Estrella line, "New Generation" in the amount of 4,850 MW can be accommodated by the Palo Verde transmission system without installation of a Panda 500/230 kV transformer.
2. Approximately 390 MW increase in the Panda Gila River Generation Plant output can be dispatched if the Panda project is interconnected with the Arizona local 230 kV transmission system by installing a 500/230 kV transformer.
3. The Palo Verde transmission thermal limits were constrained by the respective continuous rating of either the Hassayampa-N. Gila 500 kV line or the Hassayampa-Kyrene 500 kV line.
4. The Palo Verde stability limit was determined by a three-phase fault on the Palo Verde 500 kV bus and a subsequent loss of both Palo Verde-Westwing 500 kV lines.

As mentioned in the summary table above, the Panda sensitivity studies were performed based on the following assumptions:

1. The Panda Gila River Generation Project (Panda Gen) was the only project to interconnect with the Hassayampa-Kyrene 500 kV line.
2. The GBPP Generation Project was interconnected to the Hassayampa 500 kV Switchyard via a single circuit 500 kV line.
3. The generation output for the Panda Gen and GBPP projects were not maximized. The Panda Gen Project was dispatched in the ranges of 1250 MW to 1640 MW and PDE Gen Project was dispatched at 550 MW.

The current plan, as proposed by GBPP, is to interconnect with the Jojoba-Gila River 500 kV double circuit lines at an intersection about 2 miles north of the Gila River 500 kV Switchyard (Watermelon). Given these modifications in system representation, it was necessary to perform additional study work to assess the impact of these system modifications on the Palo Verde and the interconnected WSCC system with an emphasis on dispatching the maximum generation for both Panda Gen Project (2080 MW) and GBPP Generation Project (833 MW).

### III. Conclusions

Based on the results of this impact study, the following was concluded:

1. The maximum generation that can be scheduled out of the Gila River vicinity to the Arizona and California load centers is a function of the capability of some of the Palo Verde transmission system components. This transmission capability is based on a thermal limitations on either the Hassayampa- N. Gila line 500 kV line or the Hassayampa-Kyrene 500 kV line.

- a) The maximum GBPP generation that can be accommodated by the Configuration 1 transmission system (without Panda 500/230 kV transformer) is about 583 MW if the Panda Gila River generation is maximized at 2080 MW output.
  - b) The maximum new GBPP generation can be increased to 683 MW for the Configuration 2 transmission system (with Panda 500/230 kV transformer) if the Panda generation was still at its maximum output of 2080 MW.
2. The interconnection of the proposed GBPP Generation Project with the respective amount of power schedule noted in 1.a and 1.b above will not have any adverse impact on the Palo Verde Nuclear Plant, its associated transmission system, and the WSCC interconnected system.
  3. The common corridor outage for a simultaneous loss of both Jojoba-Gila River double circuit 500 kV lines and a subsequent trip of combined maximum generation output (a total of 2911 MW) will not cause a stability problem. The interconnected transmission system can withstand such critical outage without causing wide spread cascading outages. The consequence of this double circuit outage is comparable to the result of a simultaneous trip of two Palo Verde generators. Both double contingencies are acceptable and meet the WSCC Performance Criteria Level C.
  4. The stability performance resulting from a three-phase fault on the Palo Verde 500 kV bus and fault cleared by loss of both two Palo Verde-Westwing 500 kV lines became less severe due to power flow displacement for these two critical lines when more Panda and GBPP generation was dispatched at the Gila River location, which is further away from the Palo Verde vicinity.

#### **IV. Discussion on Study Results**

##### **(A) Power Flow Impact**

The following technical discussion is based on the various system conditions studied and demonstrate no adverse power flow impact on the Palo Verde and the Southwest interconnected transmission system due to the Gila River interconnection of the GBPP Generation Project.

##### **1. Configuration 1 (Without Panda 500/230 kV Connection):**

(See PF-TABLE 1)

##### **Benchmark System (Without GBPP Project):**

For base case conditions, that included accommodation of new generation of 4,650 MW by the Palo Verde transmission system, the heaviest loadings on both the Hassayampa-N. Gila and Jojoba-Kyrene 500 kV lines were occurred. They were reached at 100.5% and 100.4% of their continuous ratings, respectively. Neither N-1 contingency problems nor low system voltages were noted.

##### **Post-GBPP System (With GBPP Project):**

For base case conditions with 4,650 MW of new generation that included the power schedule of 833 MW of GBPP generation and 2080 MW of Panda Gila River generation to deliver to the Palo Verde transmission system, the heaviest loadings on both the Hassayampa-N. Gila and Jojoba-Kyrene 500 kV lines occurred. Flow on these lines reached 100.6% and 106.4% of their continuous ratings, respectively. A slight overload also occurred on the remaining Jojoba-Gila River Tap 500 kV line (101.1% of its emergency rating) for loss of one Jojoba-Gila River Tap 500 kV line.

Further studies indicated that these overloading problems could be overcome if the GBPP generation output was reduced to 583 MW. As a result, the loading on the Jojoba-Kyrene 500 kV line was reduced to 100.3% of its continuous rating. The remaining Gila River Tap-Jojoba 500 kV line loading was reduced to 91.5% of its emergency rating for a loss of one Gila River Tap-Jojoba 500 kV line.

**1. Configuration 2 (With Panda 500/230 kV Connection):**

(See PF-TABLE 2)

**Benchmark System (Without GBPP Project):**

For base case conditions, that included accommodation of new generation of 5,040 MW by the Palo Verde 500 kV and local 230 kV transmission systems, the heaviest loadings on both the Hassayampa-N. Gila and Jojoba-Kyrene 500 kV lines occurred. Flows on these lines reached 100.1% and 100.0% of their continuous ratings, respectively. No N-1 contingency problems or low system voltages were noted.

**Post-GBPP System (With GBPP Project):**

For base case conditions with 5,070 MW of new generation that included the power schedule of 833 MW of GBPP generation and 2080 MW of Panda Gila River generation to deliver to the Palo Verde 500 kV and local 230 kV transmission systems, the heaviest loadings on both the Hassayampa-N. Gila and Jojoba-Kyrene 500 kV lines occurred. They reached 100.2% and 104.6% of their continuous ratings, respectively. No overload occurred on the remaining Jojoba-Gila River Tap 500 kV line (84.1% of its emergency rating) for loss of one Jojoba-Gila River Tap 500 kV line. No voltage problems were detected for any N-1 contingencies.

Further studies indicated that this overloading problem could be overcome if the GBPP generation output was reduced to 683 MW. As a result, the loading on the Jojoba-Kyrene 500 kV line was reduced to 100.3% of its continuous rating. The remaining Gila River Tap-Jojoba 500 kV line loading was reduced to 79.0% of its emergency rating for a loss of one Gila River Tap-Jojoba 500 kV line.

**(B) Transient Stability Impact**

The stability analysis based on the following various system conditions indicated that no adverse impact on the Palo Verde plant stability and the integrated WSCC transmission system due to the interconnection of the GBPP Generation Project to the Palo Verde transmission system.

**1. Configuration 1 (Without Panda 500/230 kV Connection):**

(See TS-TABLE 1)

**Benchmark System (Without GBPP Gen Project):**

The following three N-2 contingency outages were established for stability benchmark performance using the pre-GBPP Project power flow limit case:

- (a) Three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV lines and a subsequent trip Panda generation of 2080 MW
- (b) A simultaneous trip of two Palo Verde generators (loss of 2909 MW generation)
- (c) Three-phase fault at the Palo Verde 500 kV bus with outage of two Palo Verde-Westwing 500 kV lines

For the Pre-GBPP Project benchmark system, the stability results showed that all three N-2 contingency outages were stable and damped. The worst case was a simultaneous loss of two Palo Verde generators (loss of 2809 MW generation). This case resulted in a maximum transient voltage dip of 0.86 P.U. (22% deviation) at the Malin 500 kV bus. The next worst case was a three-phase fault at the Palo Verde 500 kV bus and fault cleared by the loss of two Palo Verde-Westwing 500 kV circuits. This case resulted in maximum voltage dips of 0.91 P.U. (15% deviation) and 0.92 P.U. (16% deviation) respectively, at the Palo Verde and Malin 500 kV buses. The least critical case was a three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV circuits and a subsequent trip of 2080 MW of Panda generation. This case caused a maximum transient voltage dip of 0.95 P.U. (13% deviation) at the Malin 500 kV bus.

**Post-GBPP(833 MW) Project System (With GBPP Project):**

All three contingency outages simulated for the Pre-Project system were also tested in the Post-Project system. All stability results were stable and damped. The worst case was a three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV circuits and a subsequent trip of about 2900 MW of combined Panda and GBPP generation. This case resulted in a maximum transient voltage dip of 0.81 P.U. (27% deviation) at the Malin 500 kV bus. The next worst case was a simultaneous loss of two Palo Verde generators (loss of 2809 MW generation). This case resulted in a maximum transient voltage dip of 0.86 P.U. (22% deviation) at the Malin 500 kV bus. The least critical case was a three-phase fault at the Palo Verde 500 kV bus with fault cleared by the loss of two Palo Verde-Westwing 500 kV circuits. This case resulted in maximum voltage dips of 0.95 P.U. (11% deviation) and 0.98 P.U. (10% deviation) respectively, at the Palo Verde and Malin 500 kV buses.

**2. Configuration 2 (With Panda 500/230 kV Connection):**

(See TS-TABLE 2)

**Benchmark System (Without GBPP Project):**

The following three N-2 contingency outages were established for stability benchmark performance using the pre-GBPP Project power flow limit case:

- (a) Three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV lines and a subsequent trip Panda generation of 1560 MW
- (b) A simultaneous trip of two Palo Verde generators (loss of 2809 MW generation)
- (c) Three-phase fault at the Palo Verde 500 kV bus with outage of two Palo Verde-Westwing 500 kV lines

For the Pre-GBPP Project benchmark system, the stability results showed that all three N-2 contingency outages were stable and damped. The worst case was a simultaneous loss of two Palo Verde generators (loss of 2809 MW generation). This case resulted in a maximum transient voltage dip of 0.86 P.U. (22% deviation) at the Malin 500 kV bus. The next worst case was a three-phase fault at the Palo Verde 500 kV bus and fault cleared by the loss of two Palo Verde-Westwing 500 kV circuits. This case resulted in maximum voltage dips of 0.95 P.U. (11% deviation) and 0.98 P.U. (10% deviation) respectively, at the Palo Verde and Malin 500 kV buses. The least critical case was a three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV circuits and a subsequent trip of 1560 MW of Panda generation. This case caused a maximum transient voltage dip of 0.98 P.U. (13% deviation) at the Malin 500 kV bus.

**Post-GBPP(833 MW) Project System (With GBPP Project):**

All three contingency outages simulated for the Pre-Project system were also tested in the Post-Project system. All stability results were stable and damped. The worst case was a simultaneous loss of two Palo Verde generators (loss of 2809 MW). This case resulted in a maximum transient voltage dip of 0.86 P.U. (22% deviation) at the Malin 500 kV bus. The next worst case was a three-phase fault at the Jojoba 500 kV bus with outage of two Jojoba-Gila River 500 kV circuits and a subsequent trip of about 2393 MW of combined Panda and GBPP generations. This case caused a maximum transient voltage dip of 0.90 P.U. (18% deviation) at the Malin 500 kV bus. The least critical case was a three-phase fault at the Palo Verde 500 kV bus with fault cleared by the loss of two Palo Verde-Westwing 500 kV circuits. This case resulted in maximum voltage dips of 0.95 P.U. (11% deviation) and 0.98 P.U. (10% deviation) respectively, at the Palo Verde and Malin 500 kV buses.

**V. Exhibit**

Exhibit 1 shows a one-line system diagram of transmission alternatives associated with the GBPP interconnection.

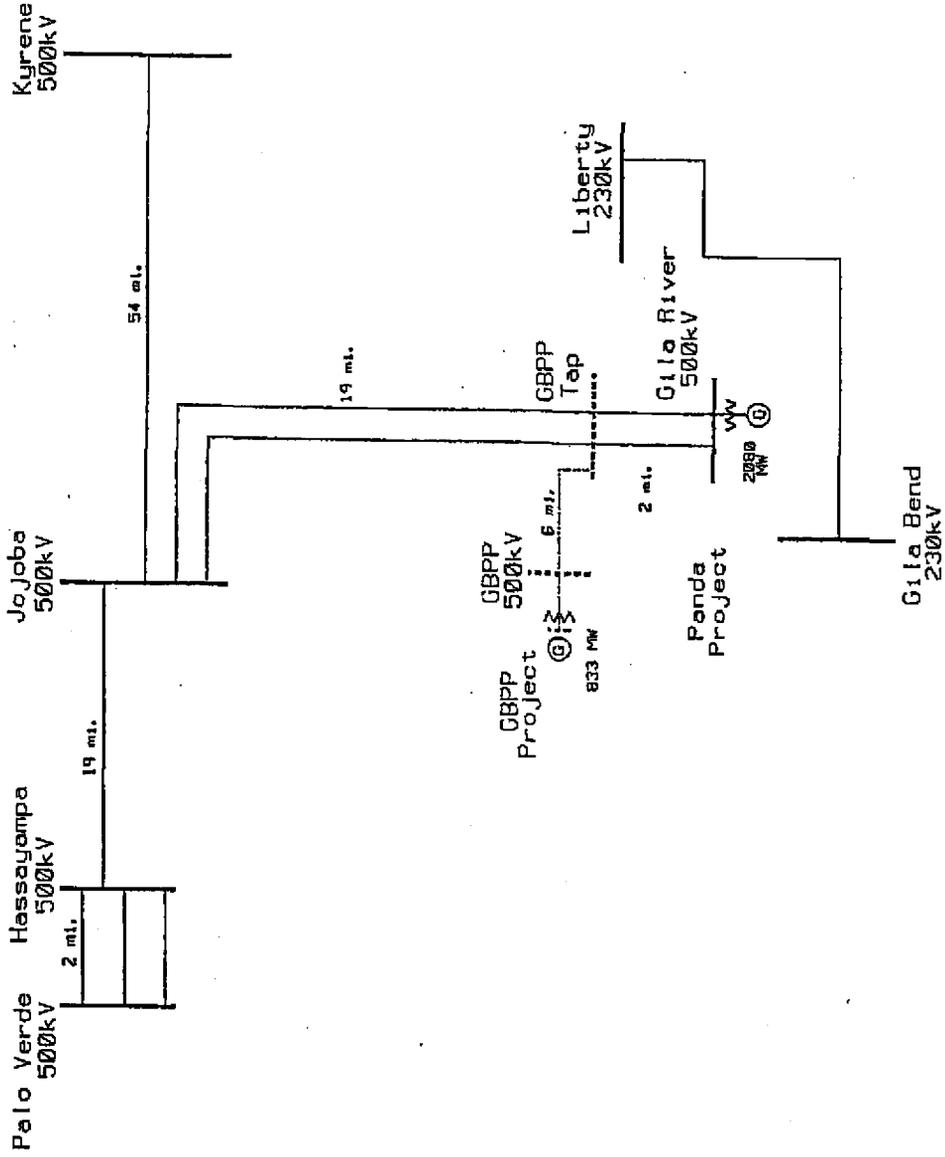
**VI. Summary Tables of Study Results**

(The attached tables summarize the study results)

1. PF-Table 1: Power Flow Impact With And Without GBPP (833 MW) Project  
(Without the Panda Gila River 500/230 KV Transformer)
2. TS-Table1: Stability Impact With And Without GBPP (833 MW) Project  
(Without the Panda Gila River 500/230 KV Transformer)
3. PF-Table 2: Power Flow Impact With And Without GBPP (833 MW) Project  
(With the Panda Gila River 500/230 KV Transformer)
2. TS-Table 2: Stability Impact With And Without GBPP (833 MW) Project  
(With the Panda Gila River 500/230 KV Transformer)

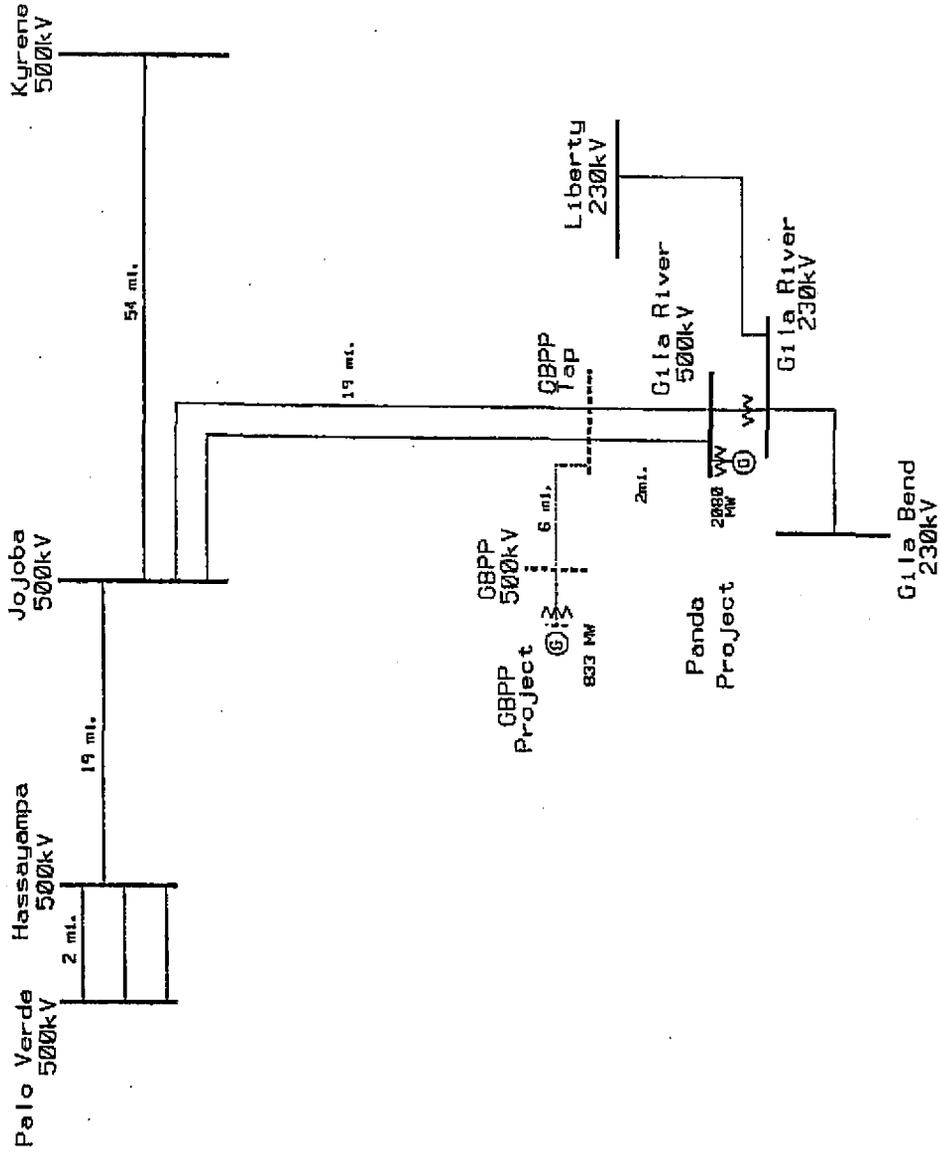
# GILA BEND POWER PARTNERS ( GBPP ) GENERATION PROJECT TRANSMISSION ALTERNATIVE 1

Configuration 1: GBPP Project w/o Panda 500/230KV Transformer



# GILA BEND POWER PARTNERS ( GBPP ) GENERATION PROJECT TRANSMISSION ALTERNATIVE 2

Configuration 2: GBPP Project w/ Panda 500/230KV Transformer



**PF-TABLE 1**  
**POWER FLOW IMPACT WITH AND WITHOUT THE GBPP(833MW) GEN PROJECT**  
(WITHOUT THE PANDA GILA RIVER 500/230 KV TRANSFORMER)

BENCH MARK	CASE DESCRIPTION	FOR GBPP ZANIBA PV NEW PANDA		PV-EST (MW)	GILA R.V. JOJOB#1 (MW)	KVR (MW)	PPK (PU)	KVR (PU)	COMMENTS						
		GEN FLOW (MW)	GEN FLOW (MW)												
2003HS-PDE-01	BASE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	5% MAX 5% MAX
	FACILITY RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	CONTINUOUS RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	EMERGENCY RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	BASE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	% OF CONTINUOUS RATING	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	NO PROBLEM
	OUTAGE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	ONE PALO VERDE-WWG OUT	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	% OF EMERGENCY RATING	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	NO PROBLEM
ALT A															
ALT B															
ALT C															
ALT D															
2003HS-PDE-02	BASE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	5% MAX 5% MAX
	FACILITY RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	CONTINUOUS RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	EMERGENCY RATING	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	BASE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	% OF CONTINUOUS RATING	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	NO PROBLEM
	OUTAGE CASE FLOW	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	ONE PALO VERDE-WWG OUT	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	% OF EMERGENCY RATING	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	66.10%	78.50%	NO PROBLEM
ALT A															
ALT B															
ALT C															
ALT D															
PDE-02R	BASE CASE (IN MW)	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	BASE CASE FLOW(IN AMP)	1400	1890	1400	1890	1400	1890	1400	1890	1400	1890	1784	1069	1162	NO PROBLEM
	% OF CONTINUOUS RATING	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	NO PROBLEM
ALT D															



**PF-TABLE 2**  
**POWER FLOW IMPACT WITH AND WITHOUT THE GBPP(833MW) GEN PROJECT**  
 (WITH THE PANDA GILA RIVER 500/230 KV TRANSFORMER)

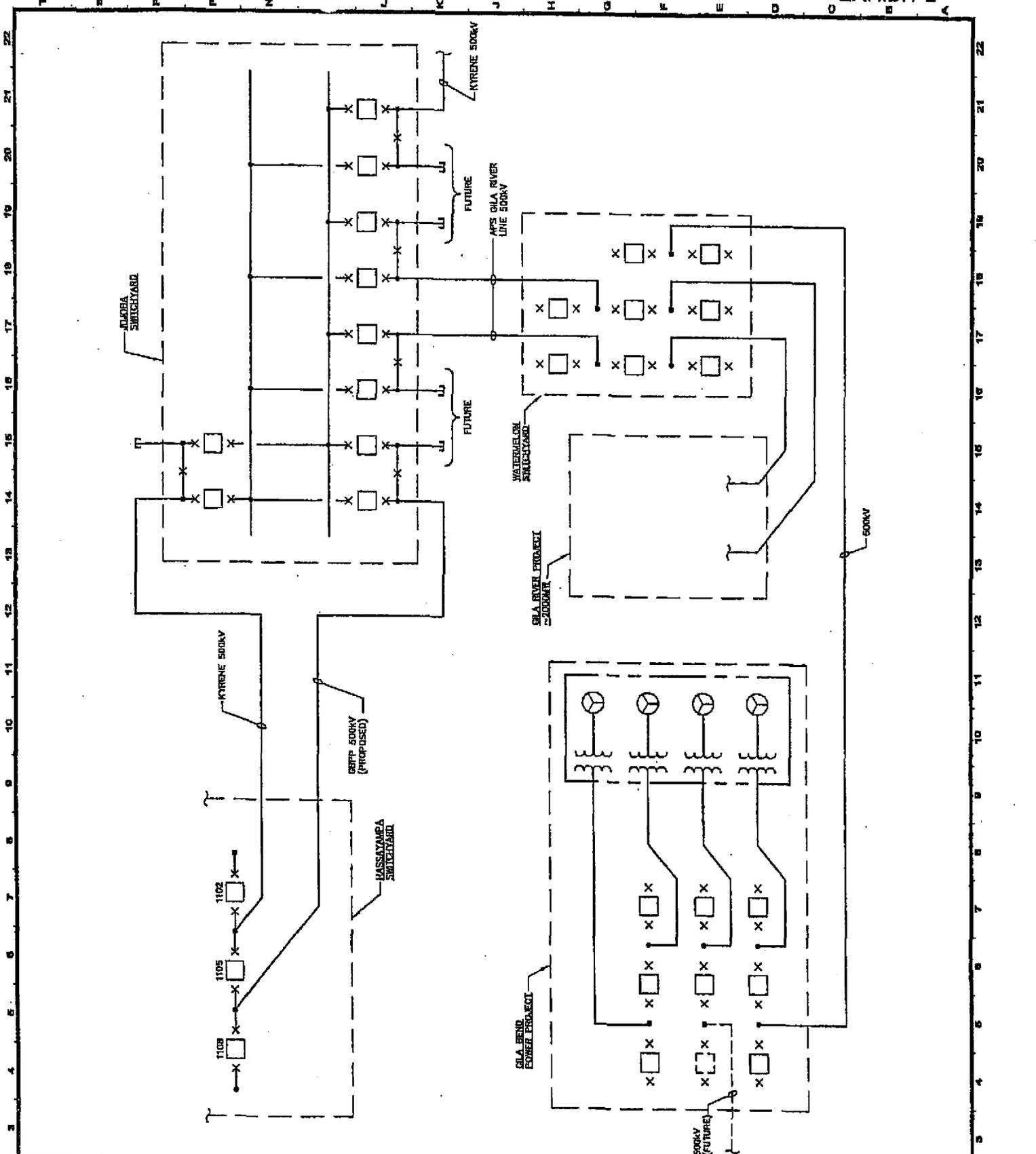
BENCH MARK	CASE DESCRIPTION	FOR GBPP PANDA GEN		NEW PANDA GEN		FOR GBPP PANDA GEN		NEW PANDA GEN		PV- WWS#1 (MW)	PV- WWS#2 (MW)	JOJOBA KYR (MW)	GILA RIVER JOJOBA#1 (MW)	PV- EST (MW)	PPK 230KV (PU)	KYR 230KV (PU)	COMMENTS
		GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)								
2003HS-PDE-03	WITHOUT GBPP PANDA GEN PROJECT	1259	1336	1518	1518	1518	1772	808	1194	1.02	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	BASE CASE (IN MW)	1259	1336	1518	1518	1518	1772	808	1194	1.02	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	FACILITY RATING	1400	1500	1630	1630	1630	2000	2100	2000	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	CONTINUOUS RATING	1800	2430	3200	3200	3200	2521	3150	2521	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	EMERGENCY RATING	1471	1471	1675	1675	1675	2000	894	1361	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	BASE CASE FLOW(AMP)	1471	1471	1675	1675	1675	2000	894	1361	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	% OF CONTINUOUS RATING	77.40%	77.40%	55.70%	55.70%	55.70%	42.60%	42.60%	42.60%	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
ALT A	OUTAGE CASE FLOW(AMP)	1487	1585	1668	1668	1668	2238	672	1596	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	ONE PALO VERDE-WWIG OUT	1487	1585	1668	1668	1668	2238	672	1596	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	% OF EMERGENCY RATING	77.60%	65.10%	84.60%	84.60%	84.60%	88.80%	27.70%	63.30%	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
ALT B	PALO VERDE-ESTRELLA OUT	1444	1536	2105	2105	2105	2377	866	1547	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	ONE PALO VERDE-ESTRELLA OUT	1444	1536	2105	2105	2105	2377	866	1547	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	% OF EMERGENCY RATING	78.40%	63.20%	65.60%	65.60%	65.60%	94.30%	27.50%	42.60%	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
ALT C	JOJOBA-KYRENE OUT	1474	1585	2274	2274	2274	2274	793	1870	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	ONE JOJOBA-KYRENE OUT	1474	1585	2274	2274	2274	2274	793	1870	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	% OF EMERGENCY RATING	78.00%	65.30%	71.10%	71.10%	71.10%	78.90%	25.20%	74.20%	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
ALT D	ONE JOJOBA- GILA RIVER OUT	1400	1489	1668	1668	1668	1989	1761	1359	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	ONE JOJOBA- GILA RIVER OUT	1400	1489	1668	1668	1668	1989	1761	1359	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		
	% OF EMERGENCY RATING	74.10%	60.50%	52.10%	52.10%	52.10%	78.90%	55.50%	53.80%	1.00	1.00	1.00	1.00	5% MAX	NO PROBLEM		

BENCH MARK	CASE DESCRIPTION	FOR GBPP PANDA GEN		NEW PANDA GEN		FOR GBPP PANDA GEN		NEW PANDA GEN		PV- WWS#1 (MW)	PV- WWS#2 (MW)	JOJOBA KYR (MW)	GILA RIVER JOJOBA#1 (MW)	PV- EST (MW)	PPK 230KV (PU)	KYR 230KV (PU)	COMMENTS
		GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)	GEN (MW)								
2003HS-PDE-04	WITHOUT GBPP PANDA GEN PROJECT	1259	1336	1486	1486	1486	1850	1213	1159	1.02	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	BASE CASE FLOW	1259	1336	1486	1486	1486	1850	1213	1159	1.02	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	BASE CASE FLOW	1400	1472	1630	1630	1630	2093	1345	1322	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF CONTINUOUS RATING	1400	1472	1630	1630	1630	2093	1345	1322	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	OUTAGE CASE FLOW	1473	1584	1630	1630	1630	2093	1345	1322	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE PALO VERDE-WWIG OUT	1473	1584	1630	1630	1630	2093	1345	1322	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	78.00%	77.50%	54.30%	54.30%	54.30%	64.10%	64.10%	66.10%	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
ALT A	PALO VERDE-ESTRELLA OUT	1449	1546	2043	2043	2043	2453	1321	1547	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE PALO VERDE-ESTRELLA OUT	1449	1546	2043	2043	2043	2453	1321	1547	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	76.70%	63.60%	63.90%	63.90%	63.90%	97.30%	41.90%	81.40%	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
ALT B	JOJOBA-KYRENE OUT	1486	1605	2251	2251	2251	2251	1243	1845	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE JOJOBA-KYRENE OUT	1486	1605	2251	2251	2251	2251	1243	1845	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	78.60%	66.00%	70.30%	70.30%	70.30%	39.50%	73.20%	73.20%	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
ALT C	ONE JOJOBA- GILA RIVER OUT	1400	1469	1621	1621	1621	2078	2648	1317	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE JOJOBA- GILA RIVER OUT	1400	1469	1621	1621	1621	2078	2648	1317	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	74.10%	60.50%	50.70%	50.70%	50.70%	62.40%	84.01%	52.20%	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
PDE-04R	BASE CASE (IN MW)	1257	1333	1463	1463	1463	1793	1143	1141	1.03	1.01	1.01	1.01	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	BASE CASE FLOW(IN AMP)	1257	1333	1463	1463	1463	1793	1143	1141	1.03	1.01	1.01	1.01	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF CONTINUOUS RATING	1400	1468	1604	1604	1604	2078	1265	1300	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE JOJOBA- GILA RIVER OUT	1400	1468	1604	1604	1604	2078	1265	1300	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	74.00%	60.30%	49.90%	49.90%	49.90%	79.10%	24.88	1294	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
ALT D	ONE JOJOBA- GILA RIVER OUT	1398	1468	1586	1586	1586	1983	2488	1294	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	ONE JOJOBA- GILA RIVER OUT	1398	1468	1586	1586	1586	1983	2488	1294	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		
	% OF EMERGENCY RATING	74.00%	60.30%	49.90%	49.90%	49.90%	79.10%	24.88	1294	1.00	1.00	1.00	1.00	EXCEEDS NO LIMITATIONS	NO PROBLEM		

TS-TABLE 2

STABILITY IMPACT WITH AND WITHOUT THE GBPP (833 MW) GENERATION PROJECT  
(WITH THE PANDA GILA RIVER 500/230 KV TRANSFORMER)

CASE NO.	CASE DESCRIPTION	POWER FLOW (MW)										STABILITY RESULTS					
		SCIT FLOW	EOR FLOW	COI FLOW	GBPP GEN	PANDA GEN	PVNG GEN	PVNG MARG	NEW GEN	PV NEW TOT	PANDA 500/230	PV500 (P.U.)	MA500 (P.U.)	COMMENTS			
<b>WITHOUT GBPP GENERATION PROJECT</b>																	
<b>BASE CASE</b>																	
(2003HS-PDE-03)																	
STAB-1	3 PH FLT @ JOJOBA 500KV BUS L/O TWO JOJOBA-GILA RIVER (TRIP PANDA GENERATION OF 1560 MW; 3 UNITS OUT OF TOTAL 4)	1220	394	203	0	200	0	0	0	504	0	0	1.03	0.96	3% Dip	10% Dip	STABLE & DAMPED
STAB-2	L/O TWO PALO VERDE UNITS (TRIP A TOTAL OF 2809 MW GEN)	1220	394	203	0	200	0	0	504	0	0	1.04	0.86	2% Dip	22% Dip	STABLE & DAMPED	
STAB-3	3 PH FLT @ PV 500 KV BUS L/O TWO PV-WWG	1220	394	203	0	200	0	0	504	0	0	0.95	0.98	11% Dip	10% Dip	STABLE & DAMPED	
<b>WITH GBPP GENERATION PROJECT</b>																	
<b>BASE CASE</b>																	
(2003HS-PDE-04)																	
ADDED	NO ADDITIONAL NEW GEN.	1225	413	209	833	2080	0	0	507	0	0	1.00	0.90	3% Dip	18% Dip	STABLE & DAMPED	
STAB-1	3 PH FLT @ JOJOBA 500KV BUS L/O TWO JOJOBA-GILA RIVER (TRIP PDE=833MW & PANDA=1560 MW; A TOTAL OF 2393 MW GEN)	1225	413	209	833	2080	0	0	507	0	0	1.03	0.80	3% Dip	18% Dip	STABLE & DAMPED	
STAB-2	L/O TWO PALO VERDE UNITS (TRIP A TOTAL OF 2809 MW GEN)	1225	413	209	833	2080	0	0	507	0	0	1.04	0.86	2% Dip	22% Dip	STABLE & DAMPED	
STAB-3	3 PH FLT @ PV 500 KV BUS L/O TWO PV-WWG	1225	413	209	833	2080	0	0	507	0	0	0.95	0.98	11% Dip	10% Dip	STABLE & DAMPED	

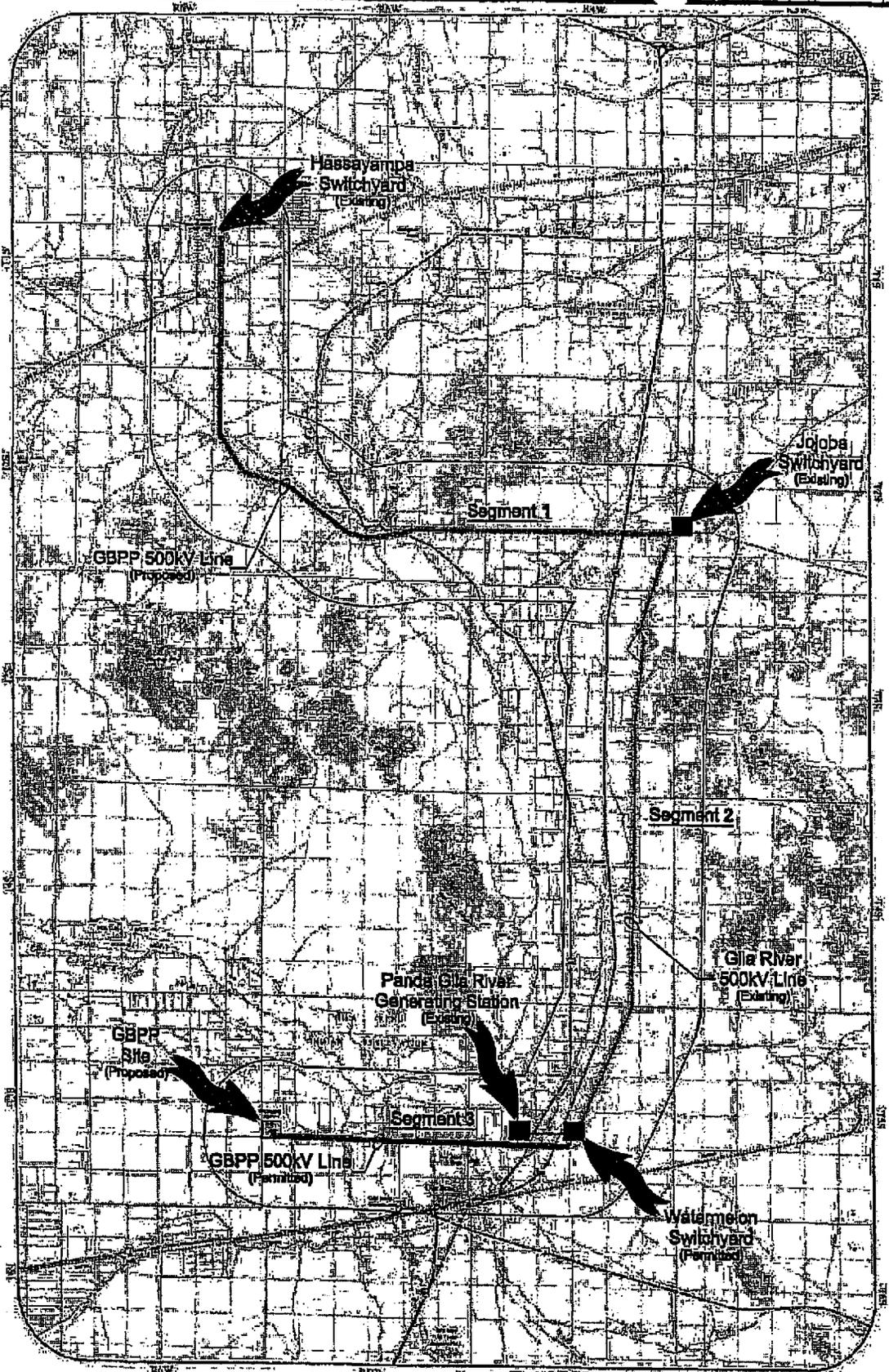


No.	Revision	Date

GILA BEND  
POWER PARTNERS L.L.C.

INTERCONNECTION  
DIAGRAM

20030204.14183  
DESIGN DRAWING ENG.  
Job Number 147100 Date 2/5/03  
Sheet Number  
**Fig 1**  
1 of 1 sheets



Consultants

No.	Revision	Date

GILA BEND  
POWER PARTNERS L.L.C.

ROUTE  
MAP

10030922A.1(102)  
 DESIGN DRAWING ELEC.  
 Job Number: 147100 Date: 2/1/03  
 Sheet Number

Fig 2

1 of 2 sheets