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AZ CORP COMMISSION

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May 13, 2013

Docket Control
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

Re: Tucson Electric Power Company's Annual Summer Preparedness Report
Decision No. 69680, Docket No. L-00000C-95-0084-00000

Enclosed please find Tucson Electric Power Company's ("TEP") annual summer preparedness report ("Report") that documents the ability of TEP's Green Valley area 46 kV system to timely restore service to: a) all customers served from Green Valley Substation and Canoa Ranch Substation following outage of the 138 kV South to Green Valley line outage; b) applicable load of UNS Electric, Inc. ("UNS Electric") customers via the 46 kV tie from Canoa Substation to Cañez Substation for an outage of the UNS Electric 115 kV line to Nogales; and c) all TEP customers and applicable load of UNS Electric customers for the concurrent outage of the South to Green Valley 138 kV line and the UNS Electric 115 kV line to Nogales. TEP is filing this report in accordance with Decision No. 69680 (July 6, 2007), Docket No. L-00000C-95-0084-00000, which modified the Certificate of Environmental Compatibility granted in Decision No. 59221 (August 8, 1995). There were no significant changes to the area loads or to the system topology since the 2012 Report was submitted; therefore the 2012 Report still applies. Moreover, the 46kV back up supply to Green Valley will no longer be needed when the 138 kV project between Canoa Ranch and Cyprus Sierrita Substations is completed this year.

If you have any questions regarding the report, please contact me at (520) 884-3680.

Sincerely,

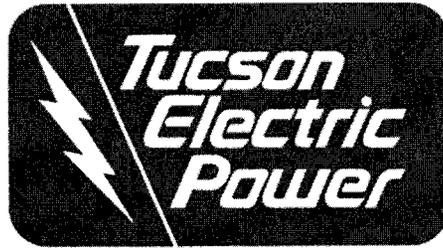
Jessica Bryne
Regulatory Services

cc: Prem Bahl, ACC
Compliance Section, ACC

Arizona Corporation Commission
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A UniSource Energy Company

2012 Green Valley and Kantor Substation Summer Preparedness

**Prepared By:
Tucson Electric Power Company**

April 2012

EXECUTIVE SUMMARY

Transmission Planning for Unisource Energy Corporation has evaluated the ability for existing transmission and sub-transmission facilities to serve load in the community of Green Valley and load served out of the Kantor substation in Santa Cruz County. As a result of evaluating contingencies involving an outage of TEP's 138 kV transmission, or UNS Electric, Inc.'s (UNSE) 115 kV transmission, it has been determined that area transmission and distribution systems are able to adequately serve load in the areas supplied by the Green Valley and new Canoa Ranch substations (TEP) and Kantor substation (UNSE) for the 2012 summer peak load period. Future plans in the Green Valley area are included in the TEP and UNSE 10 Year Plans that were filed at the Arizona Corporation Commission (ACC) in January, 2012.

BACKGROUND

Green Valley

Green Valley's power delivery needs are met by 138 kV transmission and 46 kV distribution circuits originating at TEP's South substation (Exhibit A). The 138 kV circuit is a radial transmission line serving the following substations:

- Green Valley T3 138/13.8 kV, 50.0 MVA, 60.0 MVA Emergency
- Canoa Ranch T1 138/13.8 kV, 50.0 MVA, 60.0 MVA Emergency

The 46 kV system is comprised of two 46 kV distribution circuits, 46-C-550 (rated 49 MVA) and 46-C-552 (rated 49 MVA). The TEP transformers served by this distribution, and available to back-up loss of the 138 kV circuit, include:

46-C-550

- Green Valley T1 46/13.8 kV, 25.0 MVA, 30.0 MVA Emergency
- Green Valley T2 46/13.8 kV, 25.0 MVA, 30.0 MVA Emergency

46-C-552

- Canoa T1 46/13.8 kV, 4.7 MVA, 5.6 MVA Emergency
- Cyprus Esperanza T2 46/13.8 kV, 14.4 MVA, 14.4 MVA Emergency (new since 2009)
- Raw Water Supply T3 46/13.8 kV, 9.4 MVA, 11.3 MVA Emergency

The two 46 kV transformers at Green Valley (T1 & T2) are used strictly as back-up and are not loaded under normal conditions.

Work intended for completion in 2011 to increase the capacity of the existing 138 kV radial from 227 MVA to 309 MVA was not performed. However, the present rating is more than adequate to meet the total forecast 138 kV circuit loading of 57.6 MVA at the Green Valley and Canoa Ranch substation.

Kantor

Kantor substation is one of four substations serving UNSE load in Santa Cruz County. This station is served by the 115 kV radial transmission line supplied by the WAPA Nogales substation. For loss of this line, the load at Kantor can be picked up via an existing 46 kV tie, 46C552, served from TEP's South substation. The rating of this 46 kV circuit is 49 MVA. The 46/13.2 KV transformer capacity at Kantor is 75.0 MVA. Expected load on 46C552 is 31.3 MVA including the Kantor load of 7.9 MVA. Therefore the net 46 kV system capacity exceeds the projected peak demand both for the 46 kV line and the Kantor transformer.

CONTINGENCY OPERATION

Green Valley

As seen in Table 1, there is adequate capacity on the underlying 46 kV system to back up load in Green Valley for loss of the South to Green Valley 138 kV radial transmission line in 2012. This is based on the fact that the load at the Green Valley substation is transferred to the 46 kV system via 46/13.8 kV transformation that exists at the station for this purpose. Load at the new Canoa Ranch substation will in-turn be picked up via distribution ties back to the Green Valley substation

Substation	Rating	2012 Load	Available Capacity to Support loss of 138kV ¹
Cyprus Esparanza Wells-T1 (mine)	3.1	0.5	N/A
Canoa-T2 (mine)	3.1	1.7	N/A
Cyprus Raw Water Booster-T1 (mine)	4.7	2.9	N/A
Cyprus Raw Water Supply-T1 (mine)	4.7	3.0	N/A
Green Valley-T1	25.0	0.0	25
Green Valley-T2	25.0	0.0	25
Canoa-T1	4.7	3.8	0.9
Cyprus Esparanza Wells-T2	14.4	12.2	2.2
Cyprus Raw Water Supply-T3	9.4	0.0	9.4
Total 46 kV Xfmr Capacity available to back up 138 kV			62.5
Total 138 kV Circuit Loading		69.7	57.6
46 kV Xfmr Capacity Margin			4.9

Table 1: 46 kV Margin to Back-up Loss of Green Valley 138 kV

The worst contingencies regarding the Green Valley area involve loss of one or both of the 345/138 kV transformers at the South substation. Neither the N-1, nor the N-2, contingency causes any overloads above the emergency rating on the remaining 138kV system. In addition, the N-1 contingency does not result in any elements becoming loaded above their continuous rating which indicates an ability to system adjust to achieve normal operating conditions in anticipation of additional outages. Table 2 demonstrates that there are no voltage violations greater than 5% for loss of one transformer or greater than 10% for loss of both transformers.

Green Valley Area 138 kV Contingency Voltage Deviations						
	South		Green Valley		Canoa Ranch	
	V	delta V	V	delta V	V	delta V
ALIS	1.033	0.00%	1.027	0.00%	1.027	0.00%
South-T1	1.029	0.39%	1.023	0.39%	1.024	0.29%
South-T1 + T2	0.975	5.61%	0.967	5.84%	0.967	5.84%

Table 2: Green Valley Area 138 kV Contingency Voltage Deviations

¹ Mine transformer excess capacity not considered by TEP.

Kantor

The TEP 46 kV circuit 46C552, served from South substation, is used to back up the Kantor substation for loss of the 115 kV radial serving Santa Cruz county. The 46 kV circuit is rated at 49 MVA and also serves Cyprus Esparanza Wells, Canoa, Cyprus Raw Water Booster, Cyprus Raw Water Supply and Cyprus Point A. The remaining capacity available after backing up Kantor is shown as "46C552 Margin" in the following table:

Substation	Rating	2012 Load
Cyprus Esparanza Wells-T1 (mine)	3.1	0.5
Canoa-T2 (mine)	3.1	1.7
Cyprus Raw Water Booster-T1 (mine)	4.7	2.9
Cyprus Raw Water Supply-T1 (mine)	4.7	3.0
Canoa-T1	4.7	3.8
Cyprus Esparanza Wells-T2	14.4	12.2
Cyprus Raw Water Supply-T3	9.4	0.0
Kantor	75.0	7.9
46C552 Line Load w/ Kantor	49	32.0
46C552 Line Margin		17.0
46C552 Margin w/ Green Valley 138 OOS		4.5

Table 3: 46C552 kV Loading

It is clear from Table 3 above that there is adequate capacity to serve the native Canoa and Cyprus load as well as Kantor for loss of the 115 kV circuit even after loss of the 138 kV circuit (N-1 and N-1-1 contingencies respectively). The last row in Table 3 assumes that, for the South-Green Valley 138 kV line out-of-service, non-mine 46 kV transformers are fully loaded to back-up Green Valley and therefore the increased loading on 46C552 reduces the margin on that line.

