



**Facility Study  
For  
Generation Interconnection  
Request  
GEN-2012-023**

*SPP Generation  
Interconnection Studies*

*(#GEN-2012-023)*

**July 2013**

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## Revision History

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Date	Author	Change Description
7/10/2013	SPP	Facility Study Report Issued

## **Summary**

Westar Energy (WERE) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2012-023 (115 MW/Wind) located in Harper County, Kansas. The originally proposed in-service date for GEN-2012-023 was December 31, 2014. SPP has proposed the in-service date will be after the assigned Interconnection Facilities upgrades and Non-Shared network upgrades are completed. Full Interconnection Service will require the Network Upgrades listed in the "Other Network Upgrades" section. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

## **Phases of Interconnection Service**

It is not expected that interconnection service will require phases however, interconnection service will not be available until all interconnection facilities and network upgrades can be placed in service.

## **Interconnection Customer Interconnection Facilities**

The Interconnection Customer will be responsible for all of the transmission facilities connecting the customer owned substation to the Point of Interconnection (POI), at Westar Energy owned Viola 345kV substation. GEN-2012-023 will utilize the existing GEN-2007-025/GEN-2010-005 transmission interconnection line. The Interconnection Customer will also be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging to 0.95 leading at the POI.

## **Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades**

To allow interconnection the Transmission Owner will need to upgrade associated terminal equipment for acceptance of the Interconnection Customer's Interconnection Facilities. It is determined by Westar Energy that the relay settings at the Viola 345kV interconnection substation will need to be updated after applicable protection data is received from GEN-2012-023. WERE has estimated a lead time for in-service date for these Interconnection Facilities of 6 weeks. At this time GEN-2012-023 is responsible for \$26,583.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

## **Shared Network Upgrades**

The interconnection customer was studied within the DISIS-2012-002 Impact Study. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. If higher queued interconnection customers withdraw from the queue, suspend or terminate their GIA, restudies will have to be conducted to determine the Interconnection Customers' allocation of Shared Network Upgrades. All studies have been conducted on the basis of higher queued interconnection requests and the upgrades associated with those higher queued interconnection requests being placed in service. At this time, the Interconnection Customer is allocated the following cost for Shared Network Upgrade:

Share Network Upgrade Description	Allocated Cost	Total Cost
None	\$0.00	\$0.00
Total	\$0.00	

**Other Network Upgrades**

Certain Other Network Upgrades are currently not the cost responsibility of the Customer but will be required for full Interconnection Service. These Other Network Upgrades include:

1. Mathewson – Cimarron 345kV transmission line circuit #2, Assigned to DISIS-2011-001 Customers

Depending upon the status of higher or equally queued customers, the Interconnection Customer’s in-service date is at risk of being delayed or their Interconnection Service is at risk of being reduced until the in-service date of these Other Network Upgrades.

**Conclusion**

Interconnection Service for GEN-2012-023 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Interconnection Customer is responsible for \$26,583.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 115 MW, as requested by GEN-2012-023, can be allowed. At this time the total allocation of costs assigned to GEN-2012-023 for Interconnection Service are estimated at \$26,583.00.



**Generation Interconnection Facility  
Study**

**For**

**Generation Interconnection Request  
SPP-GEN-2012-023**

**June 04, 2013**

## **Introduction**

This report summarizes the results of a Generation Interconnection Facilities Study performed for the Southwest Power Pool (SPP) by Westar Energy to evaluate a generation interconnection request by the Interconnection Customer. for 115 MW of wind-powered generation in south central, Kansas, to the Westar Energy (WR) owned Viola substation. The proposed interconnection is on the WR transmission system at the Viola substation and will utilize the existing GEN-2007-025/GEN-2010-005 interconnection. A System Impact Study has been completed for this project. The requested in-service date of the generating facility is December 31, 2014.

## **Project Location and Existing Facilities**

The project is located in south central Kansas approximately 12 miles from the existing GEN-2007-025/GEN-2010-005 wind farm location. Figure 1 shows the Regional Transmission Facilities.

## **Interconnection Facilities**

Interconnection to the WR transmission system will be by way of the Viola 345 kV substation and will utilize the existing GEN-2007-025/GEN-2010-005 interconnection.

### **345 kV Substation Work at Viola**

The estimated cost is for updating the relay settings at the Viola 345 kV interconnection substation after applicable protection data is received from GEN-2012-023. No substation physical upgrades are needed.

**\$26,583**

### **345 kV Transmission Line Work**

No transmission line upgrades are needed.

**\$0**

The total cost estimate for the Stand Alone Network Upgrades (345 kV Substation Work at Viola) is:

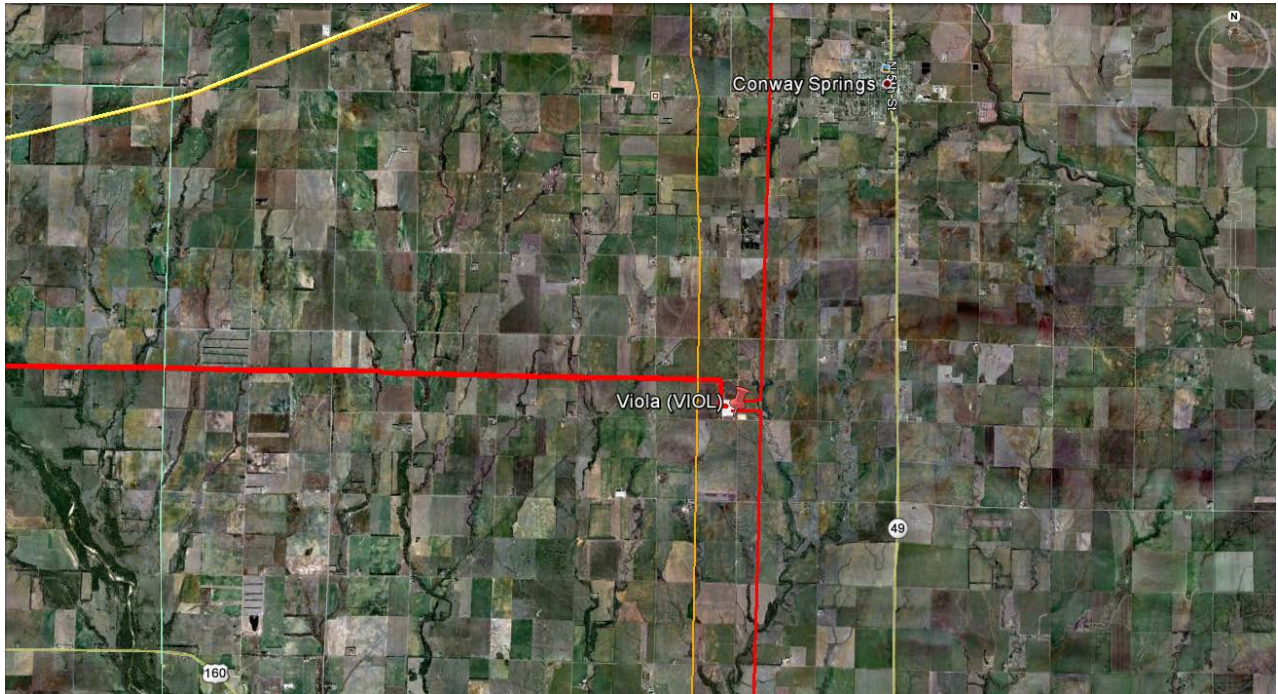
<b>\$26,583</b>	<b>345 kV Substation Work at Viola</b>
<b>\$ <u>0</u></b>	<b>345 kV Transmission Line Work</b>
<b>\$26,583</b>	

This estimate is accurate to +/- twenty (20) percent, based on current prices, in accordance with Attachment A of Appendix 4 of the Interconnection Facilities Study Agreement. However, recent cost fluctuations in materials are very significant and the accuracy of this estimate at the time of actual settings cannot be assured.

3 weeks	Engineering Time
0 weeks	Procurement Time
3 weeks	Construction Time
<b>6 weeks</b>	<b>Total</b>

Westar Energy also maintains its own Facility Connection Requirements, which may be found at ([www.wr.com](http://www.wr.com)).

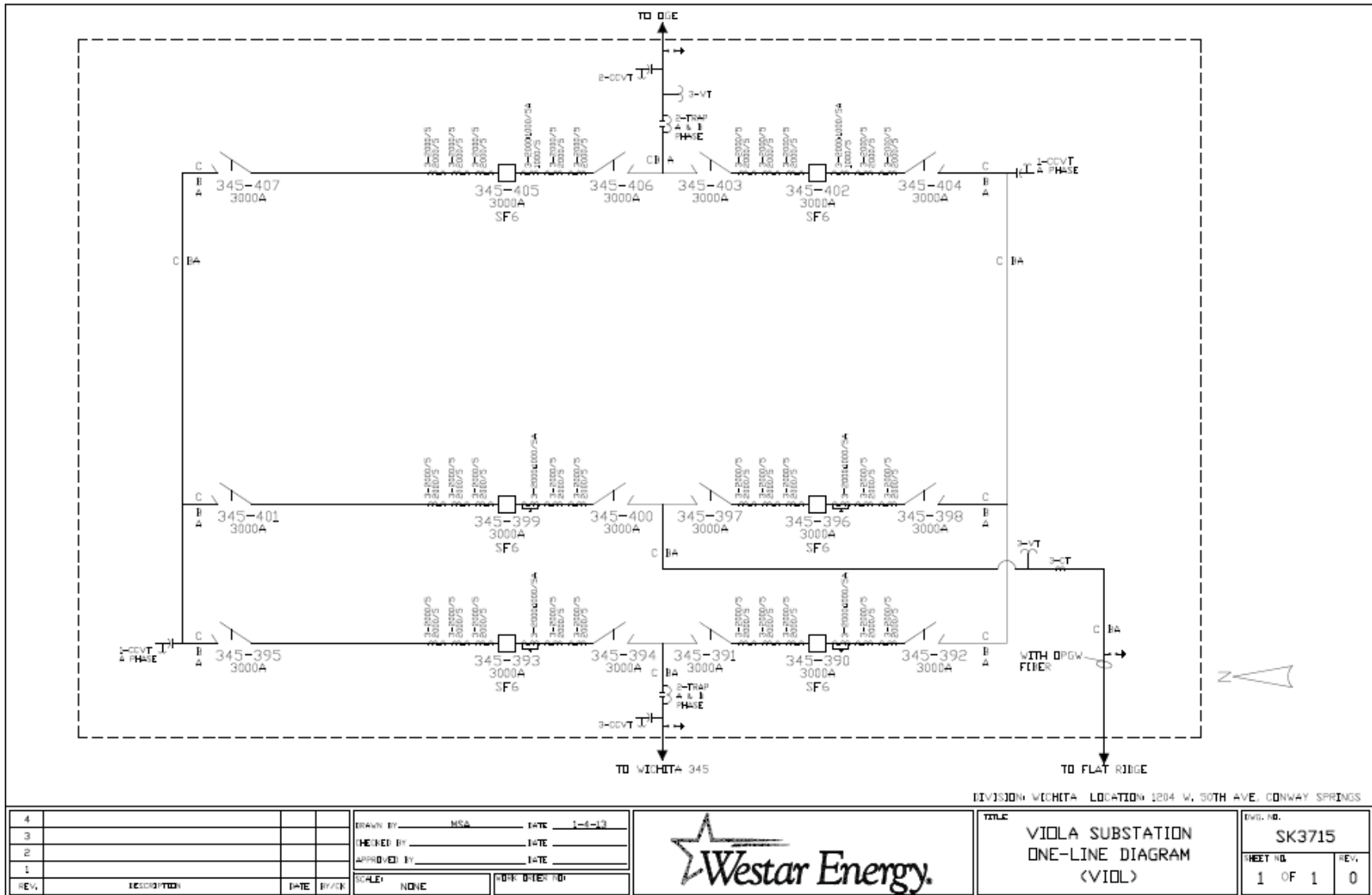
*Figure 1 – Viola Substation*



The proposed interconnection project is at Viola 345 kV substation.



Figure 2 – Existing Viola Substation One-Line



## Results of Short Circuit Analysis

As a part of this Facility Study, a short circuit study was performed to determine the available fault current at the interconnection bus (Viola 345 kV) using PSS/E's activity SCMU. The 2014 and 2024 Summer MDWG Build 1 Final Reduced models were used. All GEN-2007-025/GEN-2010-005 Wind Farm generation was taken out of service for this analysis. As a result, the numbers generated represent the available utility interconnection fault current:

### **2014 Summer:**

- For a 3-Phase fault at bus number 532798 (Viola 345 kV), the fault current is estimated to be 9036 Amps.
- For a Phase-to-Ground fault at bus number 532798 (Viola 345 kV), the fault current is estimated to be 7433 Amps.

### **2024 Summer:**

- For a 3-Phase fault at bus number 532798 (Viola 345 kV), the fault current is estimated to be 8870 Amps.
- For a Phase-to-Ground fault at bus number 532798 (Viola 345 kV), the fault current is estimated to be 8660 Amps.