AFFECTED SYSTEM INTERCONNECTION FACILITIES STUDY REPORT

ASGI-2019-001

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
01/08/2020	SPP	Initial report issued.
02/07/2020	SPP	Final report issued.

Affected System Facilities Study Report

Southwest Power Pool, Inc. ASGI-2019-001

Western Area
Power Administration

Upper Great Plains Region

December 2019

1.0 Background:

The Western Area Power Administration Upper Great Plains Region (WAPA-UGP[1]) received a request from the Southwest Power Pool Inc. (SPP) for an Affected System Facilities Study in accordance with the SPP Open Access Transmission Tariff (Tariff). NorthWestern Energy (NorthWestern) is holding Project Number 355 in their generation interconnection queue for a 20 MW wind generating facility with Point of Interconnection at a new substation on NorthWestern's Choteau-Pondera Oil Tap 69-kV Transmission Line in Teton County, MT. WAPA-UGP owns both the Conrad Substation and Shelby 2 Substation and has included these facilities under the SPP Tariff. A request was submitted to SPP for an Affected System Impact Study (ASIS). SPP assigned queue identifier ASGI-2019-001 to the request.

2.0 Status of Existing Studies applicable to Request:

The *SPP # SGI-2019-001 ASIS Affected System Impact Study of NorthWestern Generator Interconnect #355* report, dated August 2019, identified the need to replace WAPA-UGP's Conrad 230/115 kV transformer (KV1A) with a minimum 127-136 MVA short term emergency rating transformer and also replace WAPA-UGP's Shelby 2 230/115 kV transformer (KV3A) with a minimum 149-172 MVA short term emergency rating transformer to accommodate the additional loading due to ASGI-2019-001.

This Affected System Facility Study evaluates the required facility upgrades of the Conrad 230/115 kV transformer (KV1A) and the Shelby 2 230/115 kV transformer (KV3A) to achieve the minimum and short term emergency ratings identified.

3.0 Study Requirements:

WAPA-UGP has performed this Affected System Facilities Study to determine a good faith estimate of (i) the cost estimate for the required upgrades, and the interconnection customer's appropriate share of the cost of any required upgrades, and (ii) the time required to complete construction. This Affected System Facilities Study includes an evaluation of the following:

3.1 Develop/compile cost estimates for all WAPA-UGP labor, overheads, equipment additions, modifications, etc.

3.2 Review and document any other interconnection/control area requirements. Document these additional requirements (such as indication/metering, monitoring, control, relaying) and include these in the cost estimate.

3.3 Develop an overall time schedule for completion of the necessary addition/modifications.

[1] WAPA-UGP is also referred to as "Western-UGP" in the SPP Tariff.

4.0 Study Results:

WAPA-UGP performed the following tasks to evaluate the additions to the system to accommodate the line rating increase request as studied and outlined in Section 3.0 above:

4.1 **Facility Upgrades:** The evaluation of the Conrad 230/115 kV transformer (KV1A) and the Shelby 2 230/115 kV transformer (KV3A) to achieve the minimum and short term emergency ratings identified in ASIS resulted with the following requirements:

- **Conrad 230/115 kV transformer (KV1A):** Replace existing KV1A unit with a higher rated unit. This includes replacing existing transformer foundation, modifying existing oil containment, modifying existing grounding and conduit systems, modifying existing outdoor electrical, and commissioning the new transformer. WAPA-UGP's estimated cost for labor, overhead, materials, and other miscellaneous to replace KV1A is included in Attachment A. The total cost is estimated to be $3,240,000. The interconnection customer is responsible for the entire cost of the project.

- **Shelby 2 230/115 kV transformer (KV3A):** Replace existing KV3A unit with a higher rated unit. This includes replacing existing transformer foundation, modifying existing oil containment, modifying existing grounding and conduit systems, modifying existing outdoor electrical, and commissioning the new transformer. WAPA-UGP's estimated cost for labor, overhead, materials, and other miscellaneous to replace KV3A is included in Attachment A. The total cost is estimated to be $3,540,000. The interconnection customer is responsible for the entire cost of the project.

4.2 **Contractual Agreements:** A facilities construction agreement is required for the work at WAPA-UGP's Conrad and Shelby 2 substations to proceed. SPP will tender a facilities construction agreement for negotiation and execution between the parties. The interconnection customer will be responsible for the actual costs of the transformer replacements and WAPA-UGP will require advance funding to proceed with the projects. Upon completion of the work WAPA-UGP will own, operate, and maintain the modifications and improvements to WAPA-UGP's Conrad and Shelby 2 substations.

4.3 **Interconnection/Control Area Requirements:** N/A

4.4 **Schedule:** WAPA-UGP's estimated milestone schedule for replacement of transformers at WAPA-UGP's Conrad and Shelby 2 substations is shown in Attachment A. This schedule is based on the interconnection customer's requested commercial operation date for Project Number 355 as December 31, 2022. The schedule is subject to execution of a facilities construction agreement, advance funding being provided, outage availability, and completion of an Environmental Review by the timeframes identified in the facilities construction agreement.

5.0 Environmental Review:

WAPA-UGP is a federal agency under the U.S. Department of Energy and is subject to the National Environmental Policy Act (NEPA), 42 U.S.C §4321, et seq., as amended. WAPA-UGP anticipates a Categorical Exclusion (CX) level of NEPA review will be required for the transformer replacements at WAPA-UGP's Conrad and Shelby 2 substations. WAPA-UGP's general cost estimate for a CX level of NEPA review is minimal and has been included in Attachment A as part of the project management activities.

6.0 Facilities Study Cost:

WAPA-UGP will audit the Affected System Facilities Study costs and provide a summary of these costs to SPP.

ATTACHMENT A

ESTIMATED COSTS FOR TRANSFOMER REPLACEMENTS AT CONRAD AND SHELBY 2

ITEM	ESTIMATED COST	PAYMENT SCHEDULE
Engineering, design, and project management.	$400,000	October 2020
Procurement	$4,500,000	April 2021
Construction contract and commissioning	$1,880,000	December 2021
TOTAL ESTIMATED PROJECT COST	**$6,780,000**	

ESTIMATED SCHEDULE

ACTIVITY	BEGIN	COMPLETE
Planning / Engineering Design	January 2021*	December 2021
Issue Construction Contract	January 2022	N/A
Award Construction Contract	March 2022	N/A
Construction and commissioning	April 2022	November 2022
In-Service-Date	(milestone)	**November 2022***

*Subject to execution of facilities construction agreement, advance funding being provided, outage availability, and completion of an Environmental Review prior to the start of construction.