

Date: June 4, 2008

JOB DESCRIPTION

TITLE: Weedman Substation Four Breaker 138 kV Ring Bus with a New Line Tap

BUDGET REFERENCE: ISP D19419 / DP 8120

COMPLETION DATE: June 1, 2009

NOTIFICATION: Original

SCOPE:

Add four 138 kV breakers in a ring bus configuration along with the associated disconnect switches and metering equipment. A new line tap and second 138/13.09 kV, 22 MVA transformer will be connected to the new ring bus along with the existing line tap and 138/13.09 kV, 14 MVA transformer.

JUSTIFICATION:

The existing Weedman Substation is supplied by a single 138/13.09 kV, 14 MVA transformer, tapped from AmerenIP Line 1376. An existing customer, Monsanto, is expanding their peak load from the current 2.4 MVA to 14 MVA in three steps within the next four years. A new 12 kV circuit and circuit terminal is being added in 2008 to serve their initial load addition, but a second transformer is required to accommodate their 2009 load addition. The addition of a 138 kV ring bus with four breakers will reduce the line exposure and impact of a line related outage on the ability to maintain service to the Weedman Substation loads. The cost-benefit index (SACF) for the addition of the second transformer with 138 kV ring bus and new line tap is approximately 52.

CASH FLOW IN THE 2008 - 2017 BUDGET:

	2008	2009	Total
4-Breaker 138 kV Ring Bus with New Line Tap	\$0	\$2,397,000	\$2,397,000

Prepared by *Rick Foster*  
(Consulting Engineer)

Issued by: *E. C. Pfeiffer*  
Manager  
Electric Planning

Approved by: *Marcus Borkowski*  
Vice-President  
Transmission

cc:

- |                 |                |                    |                |                    |
|-----------------|----------------|--------------------|----------------|--------------------|
| M. A. Borkowski | D. J. Schepers | E. C. Pfeiffer     | R. D. Pate     | K. D. Anders       |
| G. D. Douglass  | M. L. Harbaugh | J. V. Hackman      | W. L. Henry    | D. L. Williams     |
| G. Ringkamp     | V. Viviano     | M. Wedel           | R. Clausius    | J. L. Hartenberger |
| W. J. Hughes    | C. F. Abel     | G. T. Brownfield   | B. K. Dodd     | F. Ferracane       |
| P. A. Fife      | M. J. Hipple   | R. J. Rauschenbach | E. A. Warnecke | P. J. Nauert       |
| D. R. Waggoner  | K. R. Klotzer  | J. D. Gregory      | R. A. Mellor   | S. K. Ott          |

DETAILS (see attached sketch)

1. A new structure will be fabricated to match the existing, full tension, A-frame structure on the east line terminal.
2. Four 138 kV breakers will be installed in a ring bus configuration:
  - a. Circuit Breaker
    - Minimum continuous capability – 2000 A,
    - Minimum interrupting capability – 20 kA (symmetrical) at 145 kV maximum,
    - Maximum breaker clearing time – 3 cycles.
  - b. All bus conductor and disconnect switches should have a minimum capability of 2000 A under summer emergency conditions.
3. Transmission Operations requests supervisory control on all four 138 kV breakers. A RTU will be required that can transmit MW, MVAR, line voltage and breaker positions.
4. The project must include a new control building with provisions for pilot relaying. Relays will need to be replaced at Mahomet substation to accommodate the new pilot scheme.
5. Metering in accordance with Ameren standards.

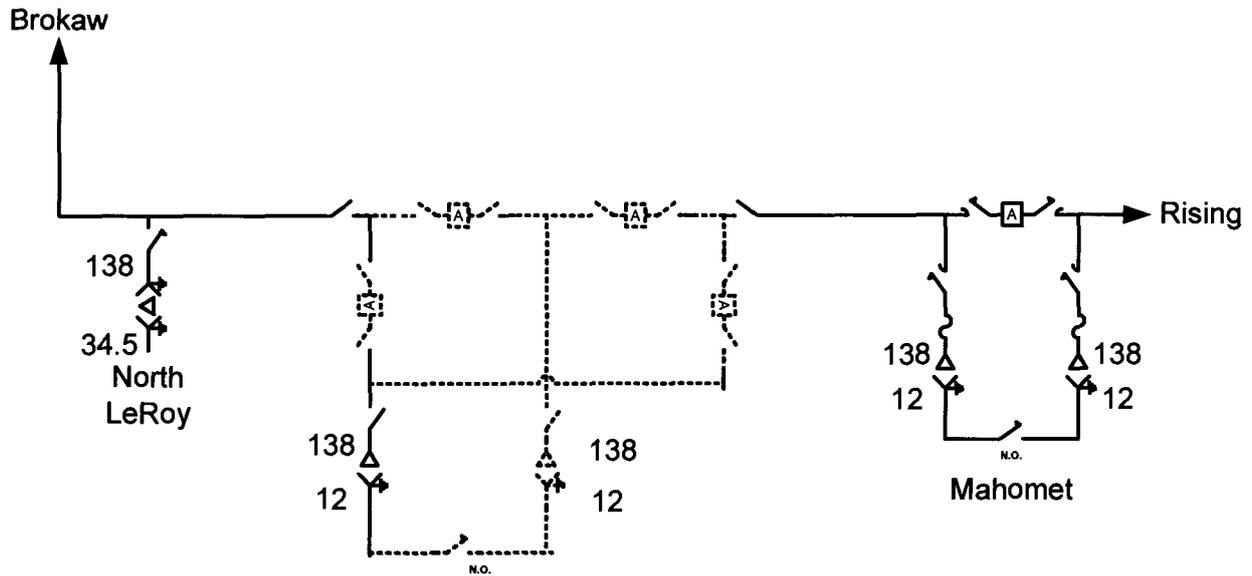
Special Considerations

- For accounting purposes this upgrade work is considered to be transmission.
- There is no impact on transmission facility ratings.
- This project will require an extended outage of AmerenIP Line 1376 while structures are moved and added.
- The segment of AmerenIP Line 1376 will likely need to be renumbered between Mahomet and Weedman.
- Per comment from Communications Department: Weedman Substation is on the fiber path from North Champaign to Brokaw. The fiber is not into the substation, but there is an existing splice on the line at the substation and could be brought in as part of the project. The static wire needs to be left intact, while this work is performed.
- The customer's peak demand is projected to occur in the months of September and October, and will ramp up from about 9 MVA in 2009 to 14 MVA by 2011. Their July-August peaks are expected to be

around 4 MVA. The remaining loads at Weedman are IMEA Farmer City and miscellaneous rural loads that total an additional peak of about 6 MVA.

- When evaluating the reliability difference between upgrading the existing transformer and adding a second transformer with a four breaker 138 kV ring bus, the SACF was approximately 52.
- If an extended period of time is required to upgrade the Weedman Substation, a review of load data suggests the months of November, March and April are when the total loads to be reserved would be at their lowest at around 4 MVA. Feeder tie capabilities would need to be evaluated to determine the back-up capability available from Mansfield, or any other sources.
- The only subtransmission in the area is sourced between Bondville and North Decatur and would require significant reconductoring of existing lines, an upgrade of North Decatur transformer #5, additional voltage support and a 69 kV line extension in the range of 4 miles.

# Weedman 138 kV Ring Bus and New Line Tap



RLF  
4/08