

# Cleco Power LLC

## System Impact Study for Transmission Request

March 2008

Oasis Request 71853938

The purpose of this study is to determine the availability of transfer capability across Cleco Power LLC's transmission system. This study will determine the ability to accommodate the Oasis Reservation # 71853938 for 1160 MW of Firm Yearly Network Transmission Service beginning January 1, 2010 through January 1, 2040.

This study was performed using the base case models identified in the table below. The studies were run using Siemens® PSS/e version 30 and MUST version 8.3 programs. Power flow models were developed to reflect anticipated operational conditions, including load, generation, extended outages and confirmed firm transactions, from January 1, 2010 through January 1, 2040.

Modifications to the base cases were made to reflect the latest information available. Changes that were made include the following:

1. Existing network resource generation in the sink control area was re-dispatched to allow for the transaction.
2. Customer's resources were re-dispatched to allow the transaction.
3. Cleco load was scaled to reflect the latest load forecast.
4. Confirmed firm transmission reservations were modeled for the years 2010–2040.

If the flow on a monitored facility exceeds 100% of its emergency rating under normal and single contingency conditions with the transfer in place, the loading on the facility will be compared with the loading prior to the transfer. If the transfer causes an increase in flow greater than 3.0%, the facility is expected to require improvement.

Furthermore, if the transfer results in transmission bus voltage levels falling below criteria under single contingency conditions, then voltage support facility additions must be constructed.

With confirmed transactions, the ATC analysis indicates that the transaction is limited by the following facilities with an impact greater than 3.0%. These limiting elements must be upgraded to eliminate the transfer constraints they cause.

### Study Results

ATC values were calculated for the study period and are listed below along with the limiting and contingency element. Only Cleco Transmission elements are identified in this report. Due to the closely interconnected nature with neighboring control areas, violations in neighboring control areas ("Affected System") will require an Affected System study or proof of Confirmed Firm Transmission service with the identified Affected System in order to grant this transmission service request.

Affected System: Entergy

This transmission service request exceeds the contract path limit between the source generator and Cleco Power's Transmission system. Therefore, transmission service must be purchased from Entergy in order for the full 1160 MW to be delivered into Cleco. Additional transmission assets could be built to increase the contract path limit between the source generator and Cleco Power's Transmission system. However, the addition of assets to increase the contract path limit was not addressed in this analysis.

| Year | Limiting Element                             | Contingency Element                  | ATC (MW) |
|------|--|--------------------------------------|----------|
| 2010 | *Flanders to Hopkins 138 kV line             | Teche Unit 3                         | 39.1     |
| 2010 | *Richard to Habetz 138 kV line               | Bonin to Labbe 230 kV line           | 214.1    |
| 2010 | *Richard to Habetz 138 kV line               | Wells to Pont Des Mouton 230 kV line | 414.9    |
| 2010 | *Richard to Habetz 138 kV line               | Pont Des Mouton to Labbe 230 kV line | 500.9    |
| 2010 | *Flanders to Hopkins 138 kV line             | Terrebonne to Greenwood 115 kV line  | 529.9    |
| 2010 | *Flanders to Habetz 138 kV line              | Bonin to Labbe 230 kV line           | 569.8    |
| 2010 | *Flanders to Hopkins 138 kV line             | Scott to Judice 138 kV line          | 625.2    |
| 2010 | *Flanders to Hopkins 138 kV line             | Base Case                            | 929.7    |
| 2013 | *Flanders to Hopkins 138 kV line             | Bonin to Labbe 230 kV line           | 0        |
| 2013 | Coughlin/Cocodrie 230 kV Auto                | Cocodrie to Ville Platte 230 kV line | 54.7     |
| 2013 | *Ivanhoe to Bayou Warehouse 138 kV line      | Moril to Hopkins 138 kV line         | 588.5    |
| 2013 | *Flanders to Habetz 138 kV line              | Wells to Pont Des Mouton 230 kV line | 589.7    |
| 2013 | *Flanders to Habetz 138 kV line              | Pont Des Mouton to Labbe 230 kV line | 684.4    |
| 2018 | SW Bayou Rapides to Twin Bridges 138 kV line | Pont Des Mouton to Labbe 230 kV line | 0        |

\* Currently, there is a proposed joint project which will eliminate the transfer constraint caused by the above limiting elements in the Acadiana Area load pocket. If this project is approved, it will become part of Cleco's base plan and the customer will not be required to fund the upgrades.

The following transmission bus voltage levels fall below planning criteria (0.92 p.u. under N-1) as a direct result of the transaction for certain single contingencies. Affected busses and their worst offending single contingency are provided below.

| Year | Bus Voltage Violations | Contingency Element | Bus Voltage (P.U.) |
|------|------------------------|---------------------|--------------------|
| 2010 | *Abbeville             | Base Case           | 0.875              |
| 2010 | *Belle Place           | Base Case           | 0.904              |
| 2010 | *Bayou Vista           | Base Case           | 0.935              |
| 2010 | *Berwick               | Base Case           | 0.938              |
| 2010 | *Breux Bridge          | Base Case           | 0.939              |
| 2010 | *Duboin                | Base Case           | 0.895              |
| 2010 | *El Paso               | Base Case           | 0.938              |
| 2010 | *Flanders              | Base Case           | 0.939              |
| 2010 | *Hopkins               | Base Case           | 0.900              |
| 2010 | *Ivanhoe               | Base Case           | 0.914              |
| 2010 | *Julien                | Base Case           | 0.915              |
| 2010 | *Morbihan              | Base Case           | 0.904              |
| 2010 | *North Bend            | Base Case           | 0.936              |
| 2010 | *Patoutville           | Base Case           | 0.907              |

|      |               |                                      |       |
|------|---------------|--------------------------------------|-------|
| 2010 | *Ramos        | Base Case                            | 0.943 |
| 2010 | *Teche        | Base Case                            | 0.918 |
| 2010 | *Wax Lake     | Base Case                            | 0.938 |
| 2010 | *Belle Place  | Wells to Pont Des Mouton 230 kV line | 0.409 |
| 2010 | *Bayou Sale   | Wells to Pont Des Mouton 230 kV line | 0.484 |
| 2010 | *Bayou Vista  | Wells to Pont Des Mouton 230 kV line | 0.529 |
| 2010 | *Berwick      | Wells to Pont Des Mouton 230 kV line | 0.547 |
| 2010 | *Breux Bridge | Wells to Pont Des Mouton 230 kV line | 0.48  |
| 2010 | *Coughlin     | Wells to Pont Des Mouton 230 kV line | 0.913 |
| 2010 | *Duboin       | Wells to Pont Des Mouton 230 kV line | 0.409 |
| 2010 | *El Paso      | Wells to Pont Des Mouton 230 kV line | 0.512 |
| 2010 | *Eunice       | Wells to Pont Des Mouton 230 kV line | 0.896 |
| 2010 | *Flanders     | Wells to Pont Des Mouton 230 kV line | 0.520 |
| 2010 | *Habetz       | Wells to Pont Des Mouton 230 kV line | 0.743 |
| 2010 | *Hopkins      | Wells to Pont Des Mouton 230 kV line | 0.416 |
| 2010 | *Ivanhoe      | Wells to Pont Des Mouton 230 kV line | 0.424 |
| 2010 | *Julien       | Wells to Pont Des Mouton 230 kV line | 0.427 |
| 2010 | *Manuel       | Wells to Pont Des Mouton 230 kV line | 0.897 |
| 2010 | *Morbihan     | Wells to Pont Des Mouton 230 kV line | 0.410 |
| 2010 | *Nickerson    | Wells to Pont Des Mouton 230 kV line | 0.533 |
| 2010 | *North Bend   | Wells to Pont Des Mouton 230 kV line | 0.488 |
| 2010 | *Patoutville  | Wells to Pont Des Mouton 230 kV line | 0.422 |
| 2010 | *Plaisance    | Wells to Pont Des Mouton 230 kV line | 0.780 |
| 2010 | *Ramos        | Wells to Pont Des Mouton 230 kV line | 0.588 |
| 2010 | *Teche        | Wells to Pont Des Mouton 230 kV line | 0.433 |
| 2010 | *Wax Lake     | Wells to Pont Des Mouton 230 kV line | 0.506 |

\* Currently, there is a proposed joint project which will eliminate the transfer constraint caused by the above limiting elements in the Acadiana Area load pocket. If this project is approved, it will become part of Cleco's base plan and the customer will not be required to fund the upgrades.

### Upgrade Projects

Upgrade costs are planning estimates for transmission facilities owned by Cleco Power and/or tie lines. A facility study will provide detailed cost estimates and solutions for the limiting elements. Facility study results may be different due to transmission system configuration changes and/or prior OASIS requests in the facilities study phase. External facilities will require a system impact study or a partial facility study to obtain estimates.

| Limiting Element                             | Planning Estimate for Upgrade | Year Needed |
|--|-------------------------------|-------------|
| * Richard to Flanders 138 kV line            | \$38,000,000                  | 2010        |
| * Flanders to Hopkins 138 kV line            | \$88,000,000                  | 2010        |
| * ALP Voltage Improvement                    | \$3,500,000                   | 2010        |
| Coughlin/Cocodrie 230 kV Auto                | \$6,000,000                   | 2013        |
| * Ivanhoe to Bayou Warehouse 138 kV line     | \$9,000,000                   | 2013        |
| SW Bayou Rapides to Twin Bridges 138 kV line | \$24,000,000                  | 2018        |

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