

REPOWERING REPORT

In the course of Entergy New Orleans, Inc.'s (ENOI's) generation planning, ENOI is investigating the possibility of repowering existing steam generating units at the Michoud Power Plant. ENOI contracted with outside consultants to analyze the feasibility of this repowering option. ENOI also requested that a group of Entergy Wholesale Operations engineers with significant experience in such matters review the consultants' report. The purpose of both the initial report, and the review by EWO engineers, was to provide sufficient information to ENOI to determine whether the repowering project is in the best interest of ENOI and its ratepayers. The following information regarding the repowering is being publicly disclosed out of an abundance of caution to ensure compliance with all applicable codes of conduct.

1. The name of the plants (or units) being considered for repowering.

The consultant's report focused on repowering of unit 2 at the Michoud Plant. The report also provided a broad-brush look at repowering Michoud's units 1 & 2. The information below is based upon the repowering of unit 2. The report does not discuss specific estimates for the repowering of both units 1&2.

2. The location of the plants

Located in New Orleans, LA.

3. Amount of additional capacity expected :

The report estimates a net output from the repowered unit of about 256 MW.
(The additional capacity is equal to the repowered capacity 500 MW minus the existing unit 2 capacity of 244 MW = 256 MW)

4. The expected completion date(s) (likely a range)

A Preliminary Project Schedule shows the Definitive Estimate Phase complete in October 2002, simple cycle operation in December 2002, and combined cycle operation in May 2004.

5. The projected heat rate

The report estimates a 6968 Btu/kWh (HHV) heat rate in combined cycle operation and 7098 Btu/kWh with duct firing .

6. The fuel supply and any reconfiguration or newly constructed delivery (pipeline) facilities

Although the report did not discuss an alteration to the current gas interface, the report did address the nature of the gas requirements. In the consultants' repowering design, they assumed fuel gas compression would not be required, although the design requires gas be available at the site boundary at 500 psig minimum.

If the gas supplier cannot provide this level of pressure, then fuel gas compressors on site will be required; three 50% gas compressors would typically be provided for redundancy. The report

REPOWERING REPORT

recommends self-contained compressors covered by weather shields. If the pressure at the site boundary is only 100 psig, the report recommends three 5,000 hp compressors.

7. The interconnection point of the plant and any expected transmission reconfigurations or upgrades

To facilitate this repowering, the report recommends relocating a portion of the 115 kV switchyard, one large 115 kV tower, and some low voltage power poles and lines. In the switchyard, the report recommends a new 4 kV switchgear/MCC and bus duct. The switchgear will be replaced by a switchgear line-up of one 3000A main breaker, a 1200A feeder breaker, a future tie-breaker compartment, and a transition compartment to a high voltage MCC starter lineup.

When the HRSGs are commissioned for combined cycle operation, the report suggests that the starters that feed the existing boiler feed pumps and forced draft fans will need to be refitted with suitable current transformers to feed the new HRSG feed pumps.

The report recommends that the new combustion turbine generators should each have a new isolated phase bus, step-up transformer, and 230kV breaker. The output from each CTGs 230kV breaker will be connected to a 230kV bus, and then connected to a new bay in the 230kV switchyard by Entergy's Transmission Group. Also, new 480V station service transformers and low voltage switchgear for the gas turbines are needed to sub-feed new Motor Control Centers at the CTGs and HRSGs. The configuration of CTG connections and unit auxiliary equipment is shown on one-line diagram SK-17-1.

8. The expected emission rates (SO₂ and NO_x) and any emission control equipment

The report suggests that the estimated NO_x emissions for the repowered unit compare favorably with Unit 2's recent operating experience; 497 tons per year for fired operation of the repowered unit at a high (90%) capacity factor, versus 1349 tons per year of NO_x over the 1998-2000 operating period. CO tonnage is somewhat higher, 276 tons/year, compared with 157 tons/year of CO for current operation. It should be noted that the higher CO tonnage for the repowered unit is for more than double the net rating and a very high capacity factor. It is expected that SCR and CO catalysts will not be required, but a spool piece in the HRSG will need to be provided to permit future catalyst.

REPOWERING REPORT

9. Tables I, II, and IV

From the report, several tables contain market information.

Table 1 Estimated Performance for 2 x 1 Repowering of Michoud Unit 2		
Operating Mode	Unfired HRSGs	Fired HRSGs
Combustion Turbine Output, MW	320.8	320.8
Steam Turbine Output, MW	173.7	187.1
Gross Output, MW	494.5	507.9
Estimated Auxiliary Loads, MW (Per Table 4)	7.0	7.0
Estimated Net Output, MW	487.5	500.9
Combustion Turbine Fuel, MMBtu/hr (HHV)	3,397	3,397
Duct Burner Fuel, MMBtu/hr (HHV)	0	138
Total Fuel, MMBtu/hr (HHV)	3,397	3,535
Estimated Net Plant Heat Rate (HHV)	6,968	7,057
LSB Flow on Steam Turbine, % of VWO	94.5	102.5
Notes: Based on 75°F ambient temperature and 75°F cooling water Auxiliaries exclude transformer loss, fuel gas compression, and other loads not identified in Table 3.		

Table 1 describes the anticipated performance of the project, comparing unfired HRSGs and Fired HRSGs.

Table 2 Estimated NO_x, CO, and Thermal Emissions for Combined Cycle Repowering		
Operation	Unfired	Fired
CTG NO _x Emissions, lb/hr	112	112
Duct Burner NO _x Emissions, lb/hr	0	14
Total NO _x Emissions, lb/hr	112	126
Annual NO _x Tonnage at 90% capacity factor	442	497
CTG CO Emissions, lb/hr	56	56
Duct Burner CO Emissions, lb/hr	0	14
Total CO Emissions, lb/hr	56	70

REPOWERING REPORT

Annual CO Tonnage at 90% capacity factor	221	276
Condenser Heat Rejection to River, MMBtu/hr	1088	1172
Based on MCR Operation of Combustion Turbines at Annual Average Ambient Temperature (75°F)		

Table 2 highlights the anticipated environmental impact of the possible repowering.

Table 4				
Aux Transformer 2 Load				
Load Description	Rated HP or KVA	Existing KVA Load (note 1)	Simple Cycle KVA Load	Combin ed cycle KVA Load
Boiler Feed Pump 2E	4000	2600	2600	
Boiler Feed Pump 2W	4000	2600	2600	
Circulating Water Pump 2E	600	390	390	390
Circulating Water Pump 2W	600	390	390	390
Forced Draft Fan 2E	1500	975	975	
Forced Draft Fan 2W	1500	975	975	
Hotwell Pump 2nd Stage 2E	400	260	260	200
Hotwell Pump 2nd Stage 2W	400	260	260	200
Fuel Oil transfer pump N2	200			
Fuel Oil transfer pump S2	200			
Station Air Compressor	450	293	293	293
HRSG Feed Pump 1A	1200			1080
HRSG Feed Pump 1B	1200			0
HRSG Feed Pump 2A	1200			1080
HRSG Feed Pump 2B	1200			0
480V Power Center 2	1500	1000	1000	1000
CT/HRSG 480V Loadcenter A	1500		600	800
CT/HRSG 480V Loadcenter B	1500		600	800
CT unit 4 excitation	1000		1000	1000
CT unit 5 excitation	1000		1000	1000
CTG Starting Load	7516		7516	7516
Estimated Starting Station Aux Load (KVA for 30min)			20459	15749
Estimated Starting Station Aux Load (Amps @ 4160V)			2841	2187
Estimated Running Station Aux Load (KVA)		9743	12943	8233

REPOWERING REPORT

Estimated Running Station Aux Load (Amps @ 4160V)		1353	1798	1143
Measured KVA (calculated from amps-below)		9720		
Measured Sta Aux Load (4160V Amps- at Unit output of 150 MW)		1350		

Table 4 anticipates the impact of the repowering on local transformer load.

10. Appendix D: Major Equipment List

See Attached Document