

**Initial Investigation:  
Entergy Security Coordinator  
Webre – Richard TLR Level 5 on May 29, 2000**

- **Description of purpose/cause of hold/curtailment.**

The TLR Level 5 was called on the Webre-Richard 500 kV flowgate by the Entergy Security Coordinator on May 29, 2000 due to the tripping of the Mt. Olive – Hartburg 500 kV line caused by insulator contamination at 1235 CDT, which was carrying 845 MVA before the trip. Webre-Richard was carrying 986 MVA before the trip and 1463 MVA immediately after the trip. Webre-Richard's thermal limit is 1740 MVA. All of the underlying lines into this area were showing possible overloads if Webre-Richard were to subsequently trip. This area, which comprises approximately 30 % of Entergy's load, 80 % of CLECO's load, all of Lafayette's load and a portion of LEPA's load, was at risk for voltage collapse. The voltage at the Webre bus was approximately 495 kV and the voltage at the Richard bus was 470 kV. The Mt. Olive – Hartburg 500 kV line was restored at 1715 CDT.

- **Facility/flow gate limitations and flows at the time the TLR was initiated.**

Webre-Richard is normally limited by the post-contingent flows on the Wilbert-Livonia 138 kV line. Wilbert-Livonia is rated at 289 MVA. The LODF for Webre-Richard onto Wilbert-Livonia at the time was 24.88 %.

Facility	OSL	Thermal Rating	FLOWS		Post-Contingent for loss of Webre-Richard
			@1338	@1345	
Mt. Olive – Hartburg	1000	1732	800	0	0
Webre-Richard	1100	1732	1648	1646	0
Wilbert-Livonia	375	289	122	122	531

Note: The LODF for Webre-Richard onto Wilbert-Livonia typically is 18%. Our powerflow cases were not solving at this time due to the amount of load over generation in the area. The initial TLR Log submitted to NERC on this TLR indicated the LODF to be 18% when it actually was 24.88%.

- **TLR levels, timing and relief requested amounts**

Date	Time	Level	Requested Relief
5/29/2000	12:57 CDT	3	84 MW
5/29/2000	13:38 CDT	4	N/A
5/29/2000	13:45 CDT	5	300 MW (21MW NFNtwk, 279 MW Firm)
5/29/2000	18:35 CDT	4	0
5/29/2000	21:28 CDT	3	0
5/29/2000	22:07 CDT	1	N/A
5/29/2000	22:34 CDT	0	N/A

- **Transmission and Generation outages or changes from prediction that may have contributed.**

The cause of this TLR was the tripping of the Mt. Olive – Hartburg 500 kV line at 1235 CDT. Contributing to the line flows were the following generator outages in the affected area which were ongoing at the time of the line trip: Sabine Unit 3, 420 MVA; Sabine Unit 4, 530 MVA; Nelson Unit 2, 98 MVA. Also affecting the Webre – Richard line, Ninemile Unit 4, 748 MVA and Waterford Unit 1, 411 MVA were on planned outages. These two units could not be used to meet load for the Entergy system, thereby requiring the dispatch of the Willow Glen generation, which causes higher line flows on Webre-Richard more than would the combination of Ninemile Unit 4 and Waterford Unit 1.

Two transmission outages occurred in CLECO's transmission system: Leach – Toledo and Cooper – Leesville 138 kV lines. These had a minor effect on loading on the Webre-Richard line.

- **Procedures implemented prior to hold/curtailment.**

All available generation moved to the top and native load was curtailed.

- **Complete Transaction Curtailment lists & comparison to IDC Transaction Lists both before and after curtailment.**

IDC reports are attached. These indicate the disposition of the transactions during this TLR. More detailed information can be obtained for transactions sinking in the Entergy control area if needed. Transactions sinking in other control areas would have to be verified by those control areas.

- **Known transactions not in the IDC & actions taken.**

All transactions were in the IDC at the time of this TLR to the best of our knowledge.

- **SCIS or other system messages**

See attached. The SCIS System was giving difficulty at this time. Also attached are the IDC reports for this TLR.

- **State Estimator snapshots and security analysis including any contingency analysis or stability analysis along with any other recorded data indicating need for Transmission Loading Relief**

Below is the historic data record on the pertinent line flows from our EMS system with the post-contingent calculations:

Time CDT	----- FLOWS -----			
	Mt. Olive – Hartburg	Webre-Richard	Wilbert-Livonia	Post-Contingent on Wilbert-Livonia for loss of Webre-Richard
1200	874	963	101	341
1230	875	986	105	350
1245	0	1541	127	510
1300	0	1463	119	483
1330	0	1537	116	498
1400	0	1603	116	515
1430	0	1594	108	505
1500	0	1510	99	475
1530	0	1501	99	472
1600	0	1512	97	473
1630	244	1556	103	490
1700	244	1538	101	484
1730	934	890	74	295
1800	912	971	84	326
1830	871	955	80	318
1900	805	957	76	314
1930	821	954	73	310
2000	753	957	79	317
2100	775	1049	96	357
2200	720	927	87	318

We use a post-contingent real time display for use in managing the recurring problems in our system. Due to the crisis nature of this event printouts were not made of these screens at the time.

- **ATC limitations before, during and after the TLR event.**

TTC's before and after the TLR event:

Auto-TTC	Run Date	05/25/2000	Mon	Tue	Wed
Version 2.1	Run Time	15:22:59	29-May	30-May	31-May
Path	Imposed Limit	TTC	TTC	TTC	
EES-AECI	1800	<u>995</u>	<u>255</u>	<u>815</u>	
EES-AMRN	1000	<u>550</u>	<u>145</u>	<u>450</u>	
EES-CAJUN	2000	<u>1430</u>	<u>370</u>	<u>1140</u>	
EES-CLECO	1500	<u>445</u>	<u>65</u>	<u>710</u>	
EES-CSW	2580	<u>1035</u>	<u>435</u>	<u>825</u>	
EES-EDE	161	<u>161</u>	<u>161</u>	<u>161</u>	

EES-LAF	292	<u>280</u>	<u>10</u>	<u>292</u>
EES-LEPA	202	<u>202</u>	<u>202</u>	<u>202</u>
EES-OGE	1299	<u>935</u>	<u>400</u>	<u>845</u>
EES-SMEPA	300	<u>300</u>	<u>300</u>	<u>280</u>
EES-SOCO	2895	<u>695</u>	<u>190</u>	<u>605</u>
EES-SPA	1573	<u>1573</u>	<u>465</u>	<u>1110</u>
EES-TVA	3000	<u>720</u>	<u>200</u>	<u>625</u>
AECI-EES	1800	<u>0</u>	<u>455</u>	<u>440</u>
AMRN-EES	1000	<u>0</u>	<u>250</u>	<u>245</u>
BCA-EES	1150	<u>415</u>	<u>490</u>	<u>645</u>
CAJUN-EES	2000	<u>1080</u>	<u>405</u>	<u>730</u>
CLECO-EES	1500	<u>0</u>	<u>0</u>	<u>215</u>
CSW-EES	2580	<u>145</u>	<u>410</u>	<u>405</u>
EDE-EES	161	<u>161</u>	<u>161</u>	<u>161</u>
LAF-EES	292	<u>292</u>	<u>292</u>	<u>292</u>
LEPA-EES	202	<u>202</u>	<u>202</u>	<u>202</u>
OGE-EES	1299	<u>100</u>	<u>1040</u>	<u>565</u>
SMEPA-EES	300	<u>300</u>	<u>150</u>	<u>300</u>
SOCO-EES	2895	<u>905</u>	<u>1125</u>	<u>1215</u>
SPA-EES	1573	<u>65</u>	<u>645</u>	<u>625</u>
TVA-EES	3000	<u>935</u>	<u>1170</u>	<u>1260</u>

TTC's during the TLR event:

Auto-TTC	Run Date	05/29/2000	Mon	Tue
Version 2.1	Run Time	13:45:56	29-May	30-May
Path	Imposed Limit		TTC	TTC
EES-AECI	1800		<u>0</u>	<u>0</u>
EES-AMRN	1000		<u>0</u>	<u>0</u>
EES-CAJUN	2000		<u>0</u>	<u>0</u>
EES-CLECO	1500		<u>0</u>	<u>0</u>
EES-CSW	2580		<u>0</u>	<u>0</u>
EES-EDE	161		<u>0</u>	<u>0</u>
EES-LAF	292		<u>0</u>	<u>0</u>
EES-LEPA	202		<u>202</u>	<u>202</u>
EES-OGE	1299		<u>0</u>	<u>0</u>
EES-SMEPA	300		<u>0</u>	<u>0</u>
EES-SOCO	2895		<u>0</u>	<u>0</u>
EES-SPA	1573		<u>0</u>	<u>25</u>
EES-TVA	3000		<u>0</u>	<u>0</u>
AECI-EES	1800		<u>0</u>	<u>250</u>
AMRN-EES	1000		<u>0</u>	<u>140</u>
BCA-EES	834		<u>0</u>	<u>230</u>
CAJUN-EES	2000		<u>0</u>	<u>0</u>
CLECO-EES	1500		<u>0</u>	<u>0</u>
CSW-EES	2580		<u>0</u>	<u>510</u>
EDE-EES	161		<u>0</u>	<u>161</u>
LAF-EES	292		<u>0</u>	<u>0</u>
LEPA-EES	202		<u>202</u>	<u>202</u>
OGE-EES	1299		<u>0</u>	<u>495</u>
SMEPA-EES	300		<u>0</u>	<u>0</u>

- **Description of actions taken to avoid future hold/curtailments**

Since the immediate cause was the tripping of the Mt. Olive – Hartburg 500 kV line, Entergy inspected the Mt. Olive – Hartburg line via airplane patrols to determine if any other issues were present that could compromise its reliability. The trip that caused this TLR was due to fresh insulator contamination deposited by carrion fowl. In fact, Mt. Olive – Hartburg tripped again on May 30, 2000 due to a willow tree growing into the line in a swampy area. However, the generation situation in the area was improved, keeping the flow on the line low enough to stay out of a TLR Level 5. More patrols were completed and another problem tree was discovered on June 1, 2000. The transmission owner of that section of the line has right of way re-clearing crews working on the line now.

- **Re-dispatch actions taken.**

All available helpful generation in Entergy that could be moved was moved to the top. Close-by hurting generation in Entergy was reduced. Approximately 315 MVA of net redispatch occurred.

- **If firm transaction curtailment took place, description of Transactional Contribution Factor calculation and results as well as how necessary relief was obtained through network service and native load contribution.**

Calculation from NERC Policy 9, Appendix 9C1:

Total MVA flow on Webre-Richard:	1646
Total MW flow (Firm) from IDC on this Flowgate:	418
Total MW flow (Firm) from Internal CA Transactions:	17.8
Transaction Contribution due to Firm (TC <sub>PTP</sub> ):	436.1
Transaction Contribution Factor (TCF <sub>PTP</sub> ):	26.5%

Webre-Richard Flow:	1646 MVA
Webre-Richard OSL at this time:	900 MVA.
Relief Needed:	746 MVA
Multiplied by TCF <sub>PTP</sub>	X 26.5%
PTP Share of Relief:	198 MW
Network & Native Load Share of Relief:	548 MW

Approximately 315 MW of redispatch was ordered (all that was available) and approximately 235 MW of native load was curtailed. (Total 550 MW).