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Title: Sample EP Flow Analysis of Severely Damaged Networks

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Sample EP Flow Analysis of Severely Damaged Networks

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10/12/2016

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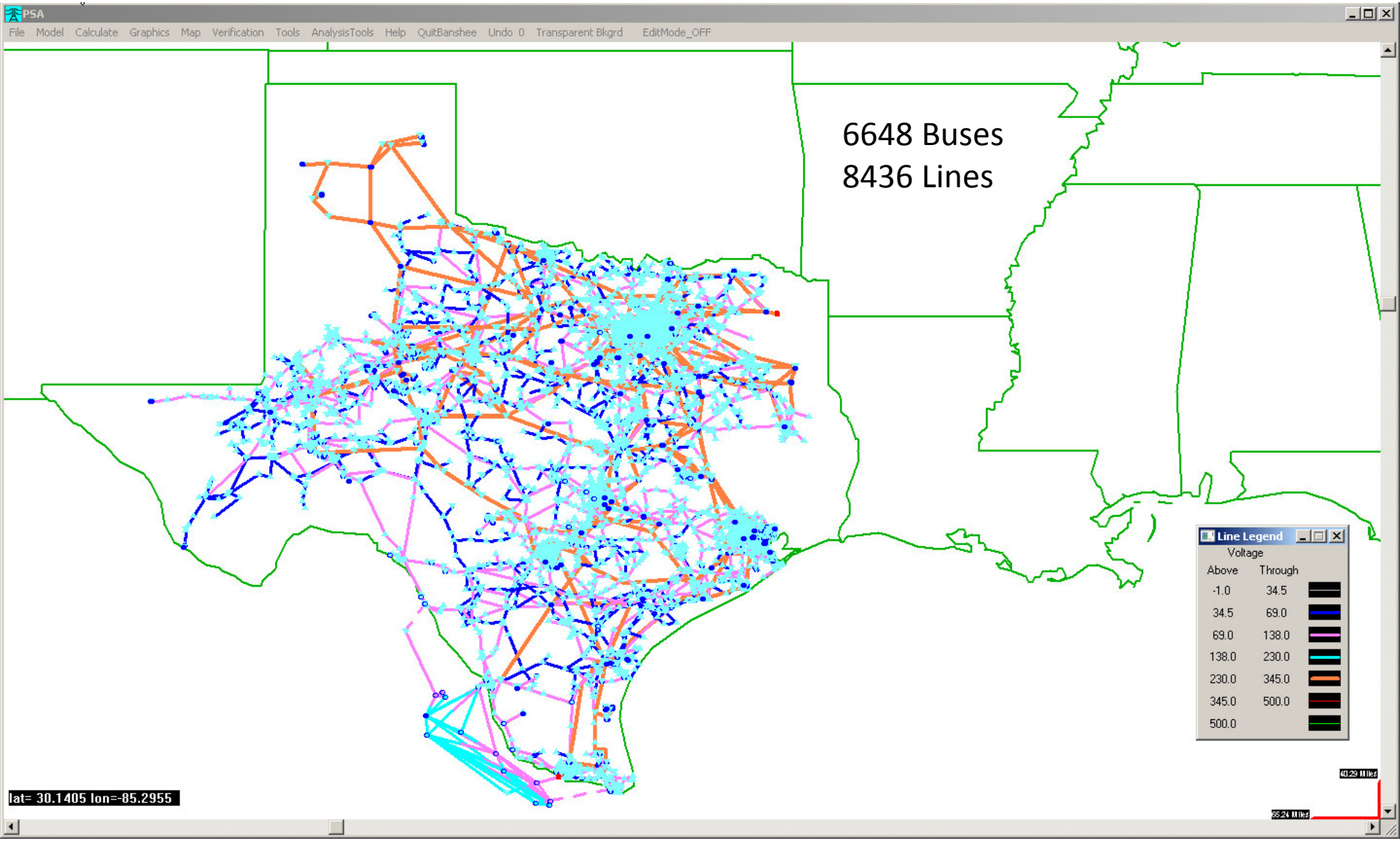
ERCOT EP Transmission Model



Zoomed in to Houston and Overlaying StreetAtlas

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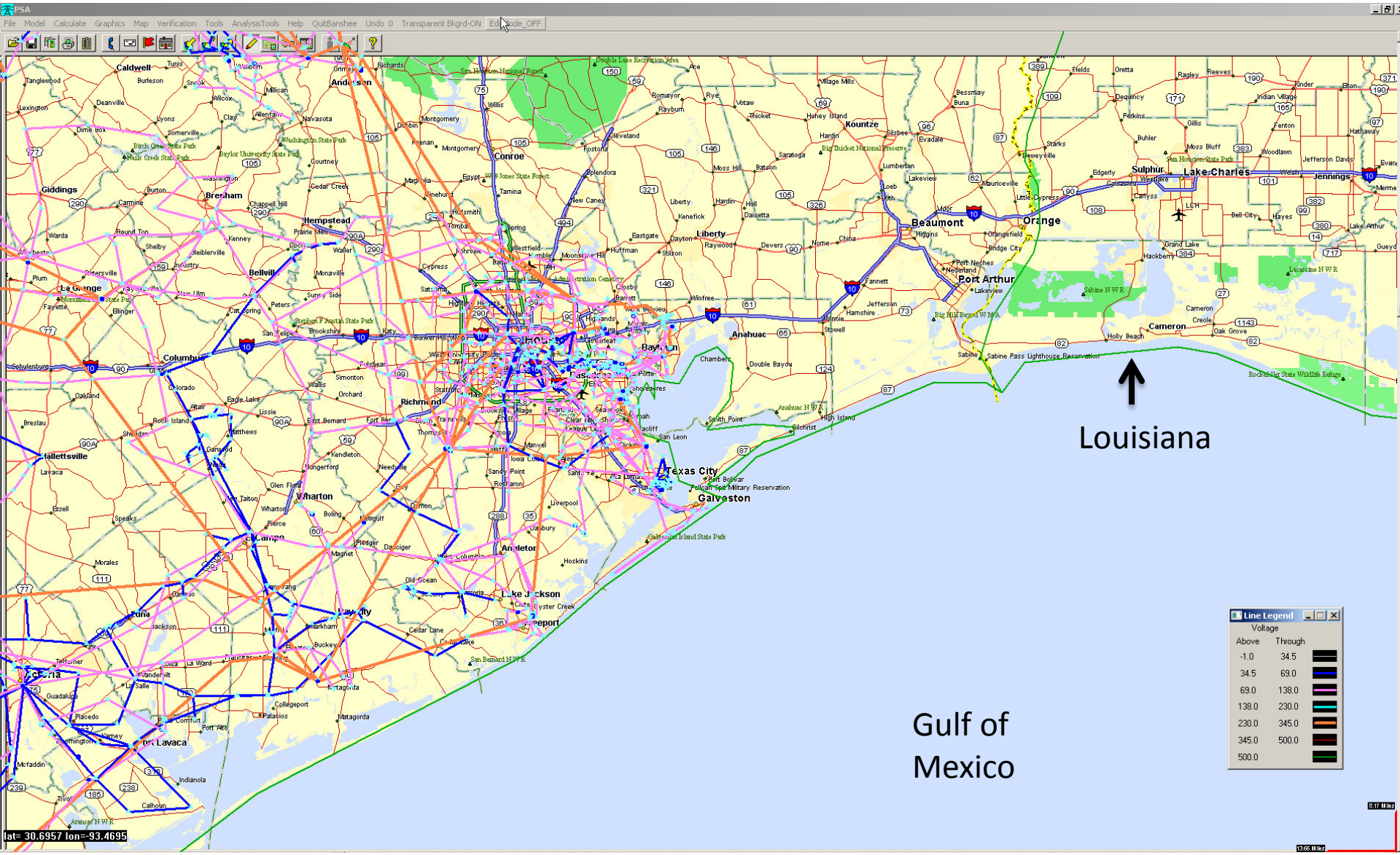

EMPACT

Solve/Dispatch/Shedding Options

Analysis Level:

0 = dc solve only
1 = qacs solve
3 = qacs solve, dispatch Gen & Load for overloaded Lines
4 = qacs solve, dispatch Gen&Ld, and shed Load for overloaded Lines
7 = qacs solve & shed load for low V
9 = Step 3 followed by Step 7

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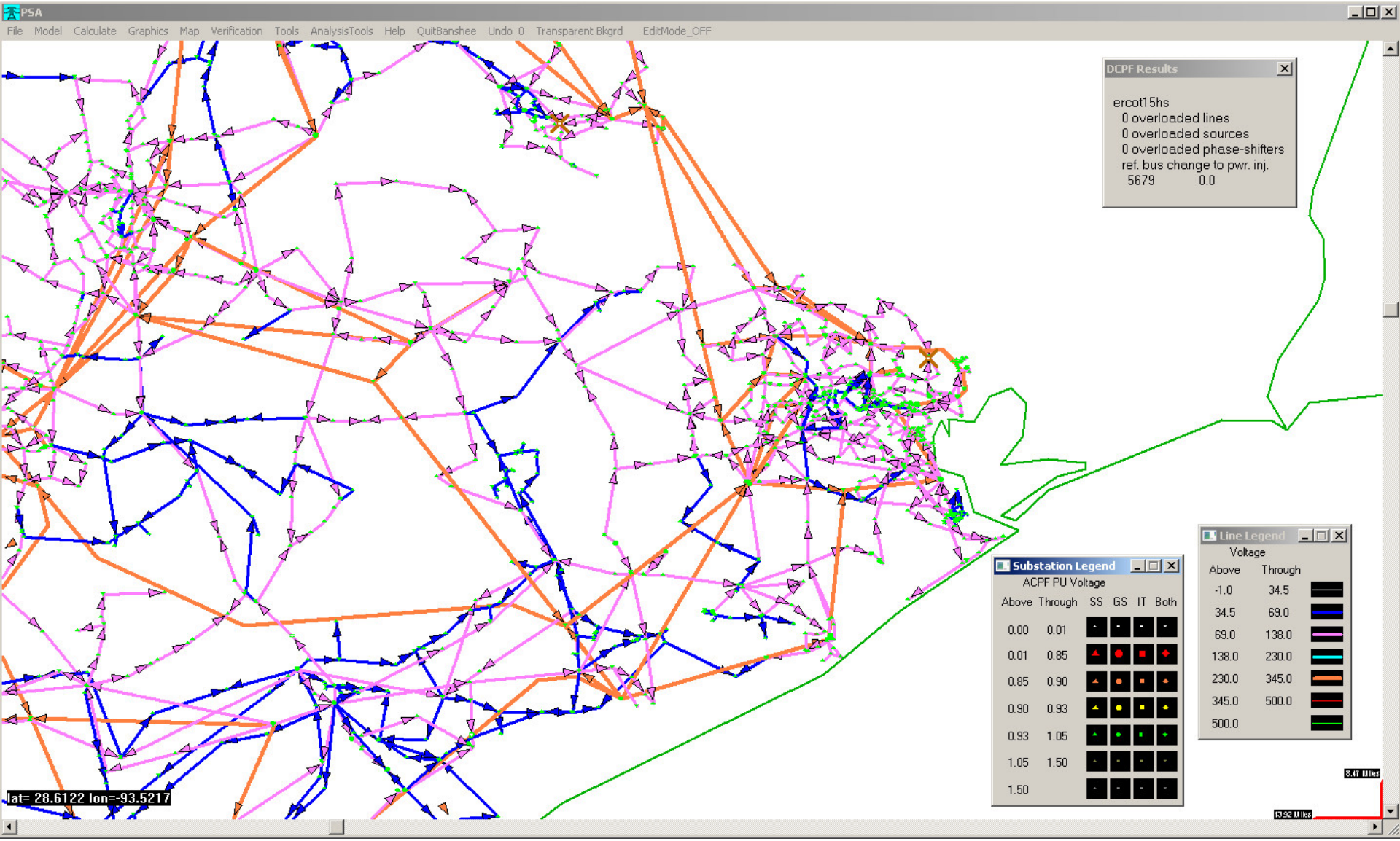
QACS BaseCase Power Flow Solution



3 Substation Contingency

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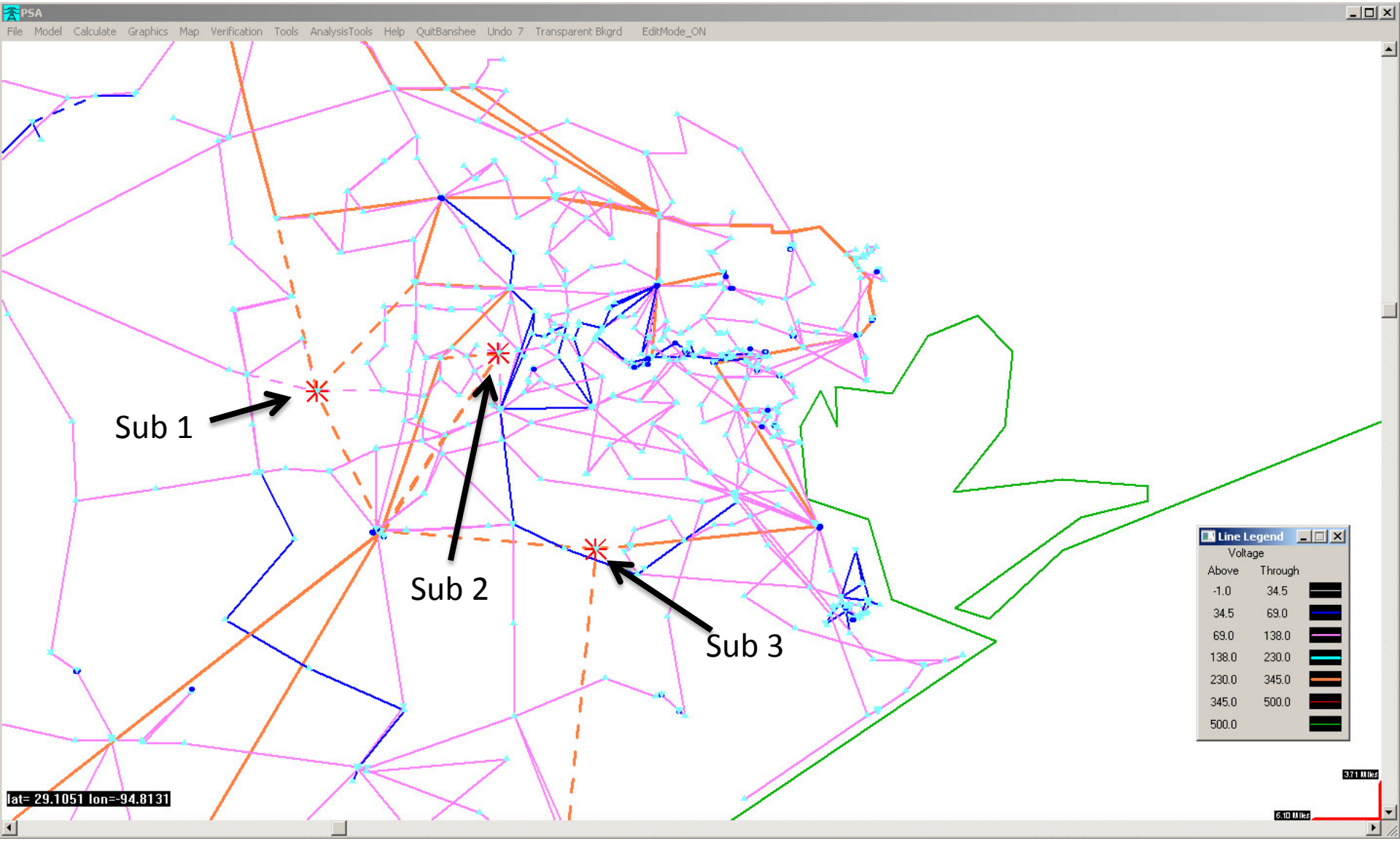

QACS Solution (3 Sub Contingency)

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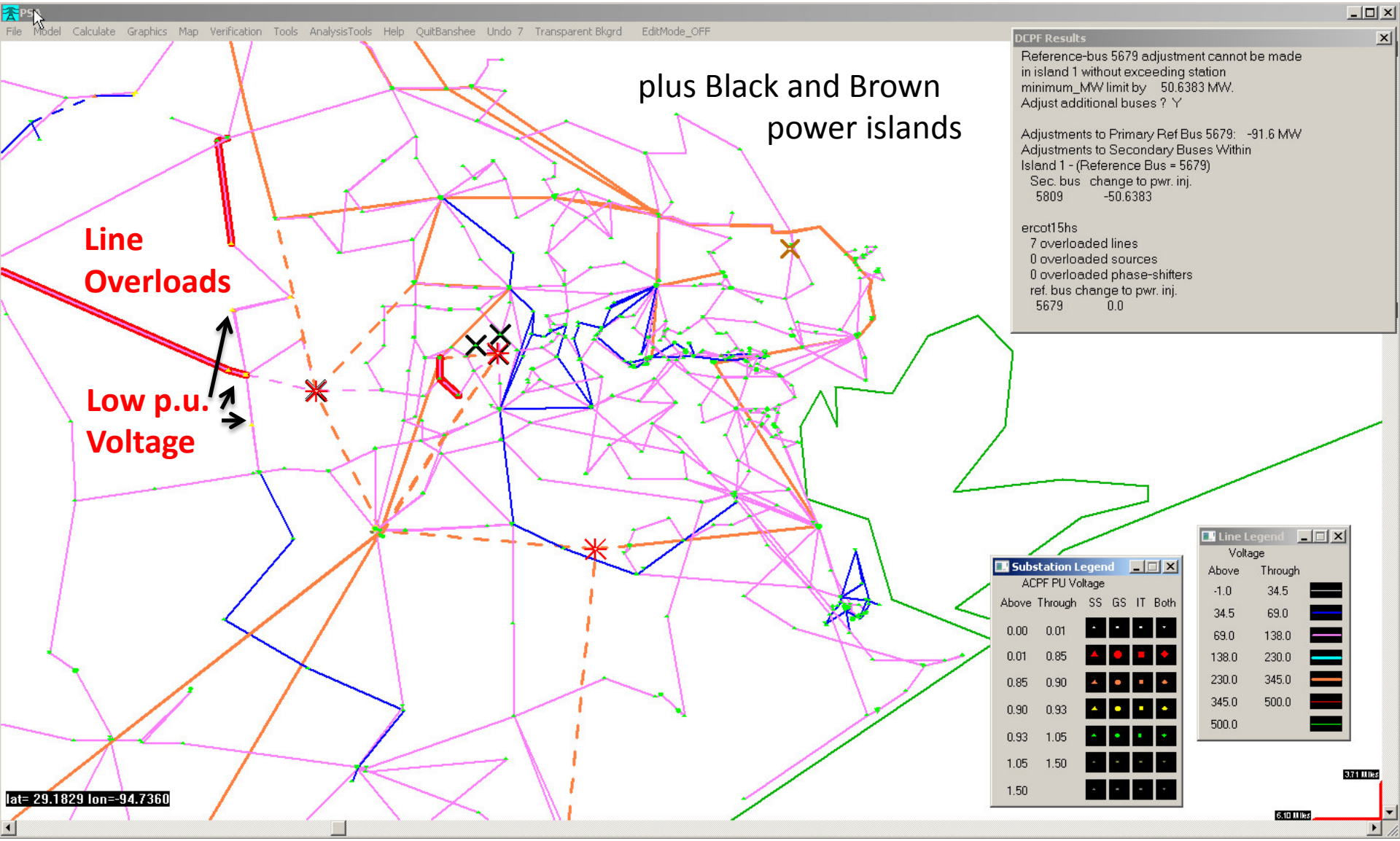

Gen. & Load/100 Optimal Dispatch

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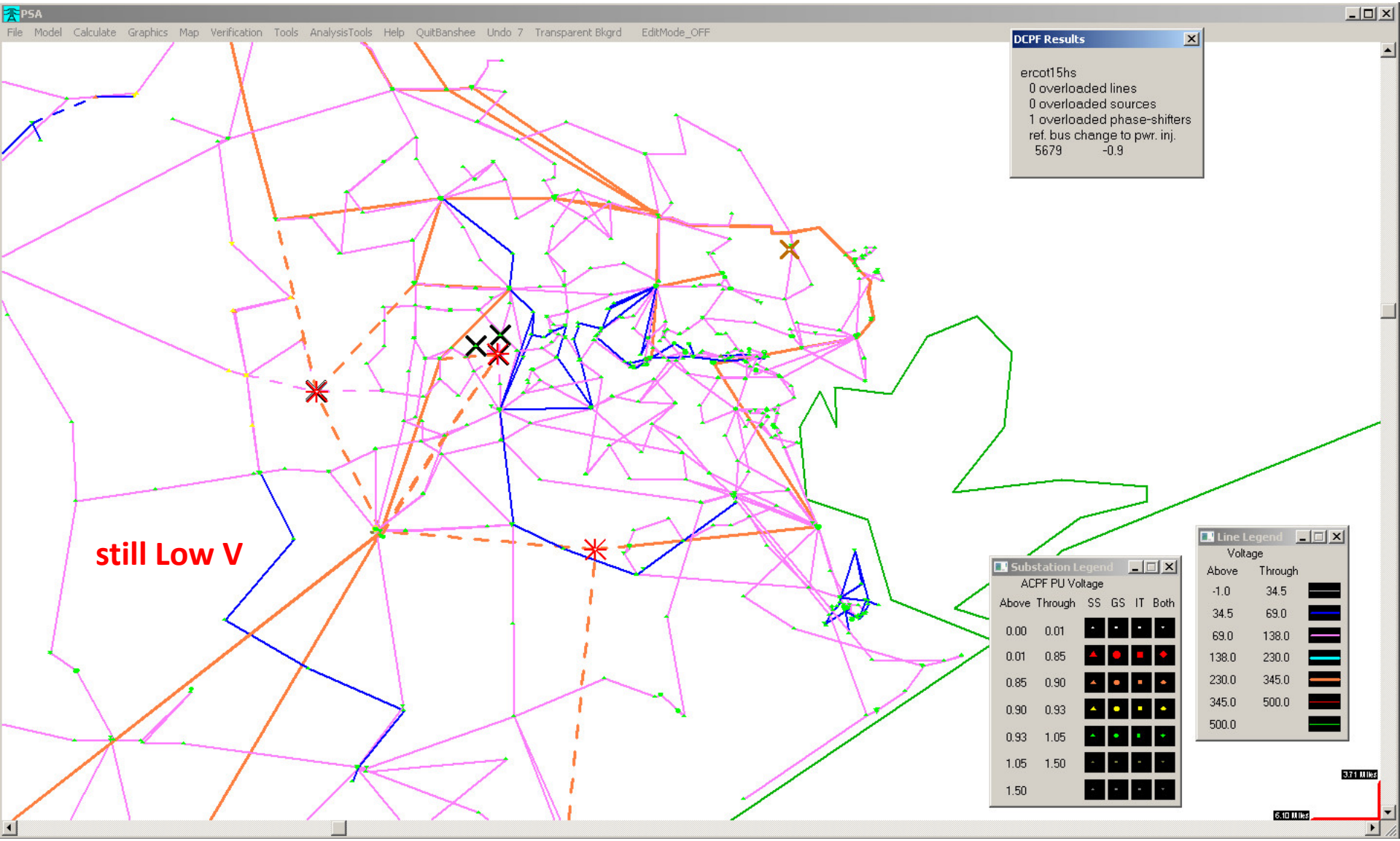

Dispatch Results:

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ercot15hs

This island=1. Total num of islands=121.

Generators that changed:

3824	WORMSER0A----(8276), was	0.0 MW, now 25.0 MW
5679	WAP_WAP_G5----(110015), was	156.0 MW, now 657.8 MW
5726	DOWG_DOW_G37----(110111), was	50.0 MW, now 59.2 MW
5729	DOWG_DOW_G61----(110114), was	60.0 MW, now 68.3 MW
5730	DOWG_DOW_G62----(110115), was	60.0 MW, now 68.3 MW
5731	DOWG_DOW_G63----(110116), was	60.0 MW, now 68.3 MW
5738	DOWG_DOW_G67----(110123), was	70.0 MW, now 95.6 MW
5739	DOWG_DOW_G66----(110124), was	63.0 MW, now 95.6 MW
5740	DOW_DOW_ST65----(110125), was	85.0 MW, now 95.2 MW
5750	DOWG_DOW_G81----(110135), was	70.0 MW, now 72.8 MW
5754	DOWG_DOW_G83----(110139), was	70.0 MW, now 72.8 MW
5761	DOW_DOW_GT96----(110146), was	120.0 MW, now 169.4 MW
5762	DOW_DOW_ST95----(110147), was	25.0 MW, now 50.0 MW
5800	ALCOA_G1----(110301), was	12.0 MW, now 48.0 MW
5802	AIRCO_G1----(110311), was	6.9 MW, now 8.0 MW
5803	NCA_NCARBIG1----(110331), was	37.2 MW, now 44.0 MW
5804	NCA_NCARBIG2----(110332), was	37.2 MW, now 44.0 MW
5806	NCA_NCARBIG3----(110334), was	29.2 MW, now 32.0 MW
5809	STP_STP_G1----(110351), was	1324.2 MW, now 1375.0 MW
5810	STP_STP_G2----(110352), was	1374.9 MW, now 1375.0 MW
5814	EXN_EXN_G4----(110374), was	50.0 MW, now 76.0 MW
5815	EXN_EXN_G8----(110375), was	18.0 MW, now 31.0 MW
5816	EXN_EXN_G9----(110376), was	95.0 MW, now 103.0 MW
5820	EXN_EXN_G14----(110381), was	80.0 MW, now 138.0 MW
5832	FOR_FORMOSG1----(110451), was	60.0 MW, now 77.0 MW
5833	FOR_FORMOSG2----(110452), was	76.0 MW, now 77.0 MW
5834	FOR_FORMOSG3----(110453), was	69.4 MW, now 77.0 MW
5835	FOR_FORMOSG4----(110454), was	66.7 MW, now 77.0 MW
5836	FOR_FORMOSG5----(110455), was	70.3 MW, now 74.0 MW
5839	FOR_FORMOSG8----(110458), was	28.0 MW, now 33.0 MW
5848	FO_FORMOSG11----(110467), was	114.0 MW, now 143.1 MW
5850	FO_FORMOSG12----(110469), was	114.0 MW, now 143.1 MW
5870	BSF_GN------(110551), was	67.0 MW, now 71.0 MW
5958	PR_PR_G2----(110921), was	26.0 MW, now 33.3 MW
5981	TC_TCHP1----(111011), was	40.0 MW, now 46.8 MW
5998	GIB_GIB_CRG1----(120061), was	470.0 MW, now 264.2 MW
6299	INGLCOSW_STG----(160153), was	135.9 MW, now 150.0 MW
6324	CCEC_GT1----(160261), was	131.2 MW, now 135.0 MW
6381	FPPYD_FPP_G1----(170101), was	604.0 MW, now 257.2 MW
6382	FPPYD_FPP_G2----(170102), was	599.0 MW, now 160.0 MW
6459	WIPOP_WPP_G1----(170331), was	88.0 MW, now 26.0 MW
6460	WIPOP_WPP_G3----(170332), was	88.0 MW, now 26.0 MW

Total gen. change= 2173.1 MW

Interties that changed:

Phase Shifters that changed:

Loads that changed:

5124	FRANZ66_8015----(44262), was	-88.9 MW, now -45.6 MW
5207	BETKA___138A----(45675), was	-2.8 MW, now 0.0 MW
5217	FREMAN__138A----(45770), was	-9.9 MW, now 0.0 MW

Total Load shed= -56.1 MW

Shed Load for Low V (result: Low V eliminated)

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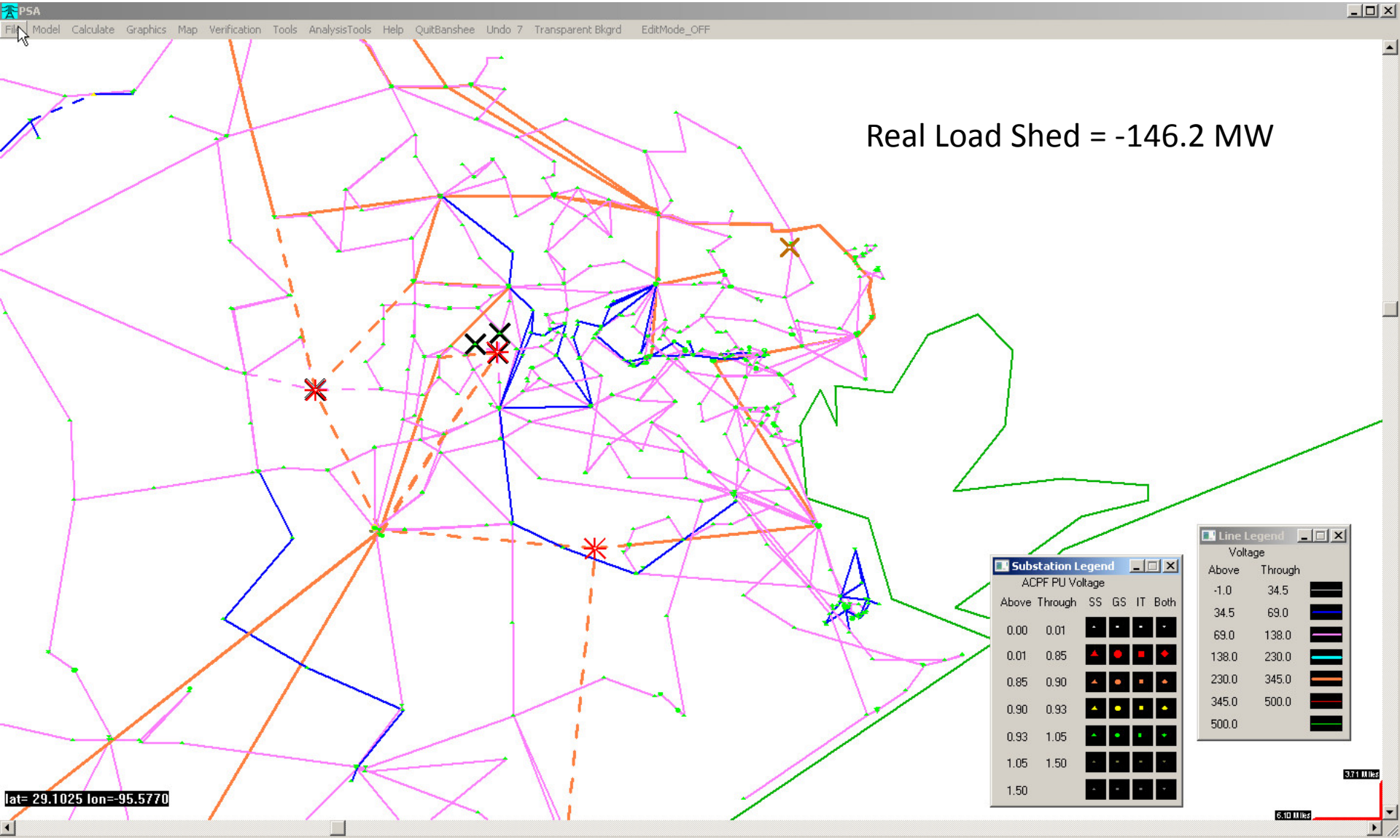

Network Damage Summary

Event Damage:

3 Subs, x Buses, Load lost = - 541 MW

Network Correction:

Generator MW changes = 2,600 MW

Dispatch load lost = - 56 MW

Load shed for line overloads = 0 (-195 MW w/o dispatch)

Load Shed for low V = -146 MW

Total load lost = -743 MW

Estimated Service Areas (Potential)

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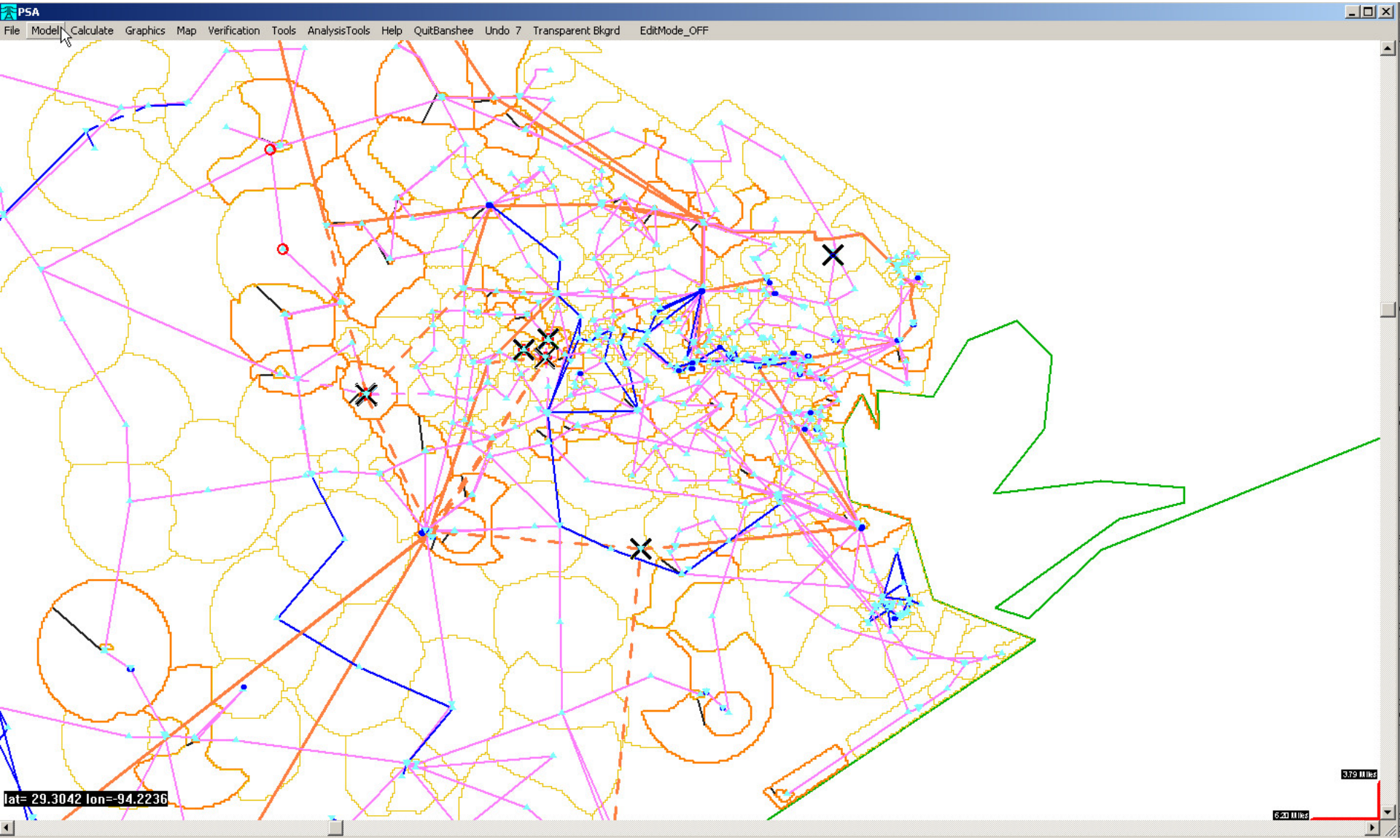

Estimated Outage Areas (potential)

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