

Internship Experience at Midwest ISO



By Glory Ali
October 17, 2008

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Electrical Engineering

Graduate in December 2008

Presently interning at Midwest ISO

Overview

- Industry Selection Process
- Brief Overview of Midwest ISO
- Job Description
- Summer Projects
- Challenges and Benefits
- Take Away...

Industry Selection Process

- Information session on campus
 - Free Pizza and Drinks is always a catch!
- Society of Women Engineers (SWE) Conference 2008
 - Networking and Career Fair
- Onsite interview with likely Managers
 - 8:30am to 5pm (Lunch was provided)
 - Control Room Tour

Midwest ISO RTO Dept



- ✓ Monitor flow of power over the high voltage transmission system
- ✓ Manage power congestion through locational marginal pricing
- ✓ Schedule transmission service
- ✓ Real time and day ahead energy markets monitoring
- ✓ 5-minute security-constrained dispatch of entire market

My Job Description

- Assisting Real Time Operations department of the Midwest ISO in developing tools, displays and procedures to continue enhancing overall market efficiencies while maintaining reliability of Midwest ISO Energy and Ancillary Service Market

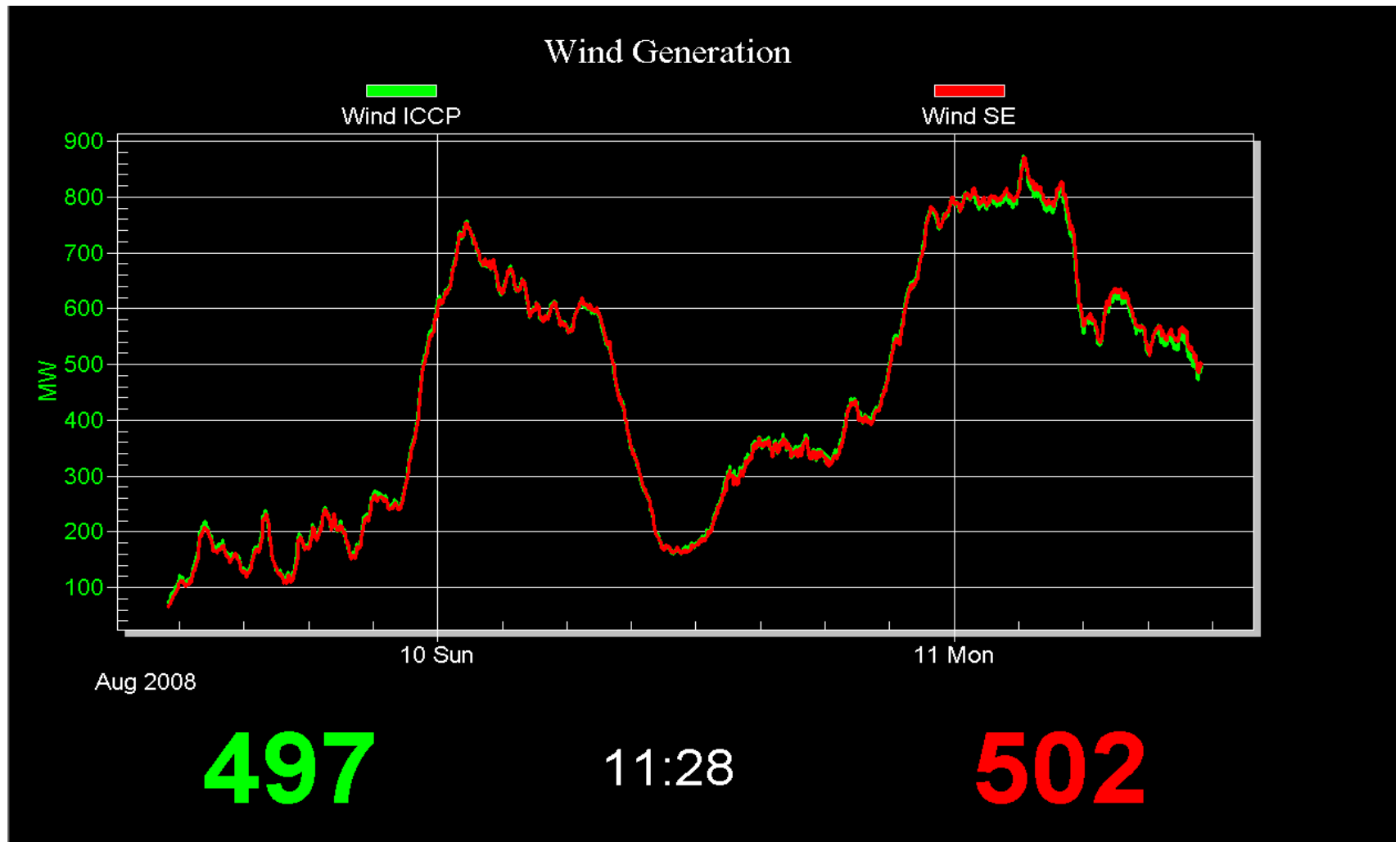
Projects I worked on

- PI(Plant Information) System
 - PI Wind Display
 - PI Peak Load Tool
 - PI Interface Display
- Also...
 - FERC Daily Report
 - 8:30 Daily Operations Performance Review (aka Daily Score card)
 - Life Lessons Series (Every Thursday)

PI/eDNA Systems

- Brings operational data /real time data into a single system that is readily available for all users
- PI vs. eDNA
 - Energy only system
 - eDNA goes away in ASM
 - PI becomes the primary data historian
 - Optimizes data archiving and is user friendly

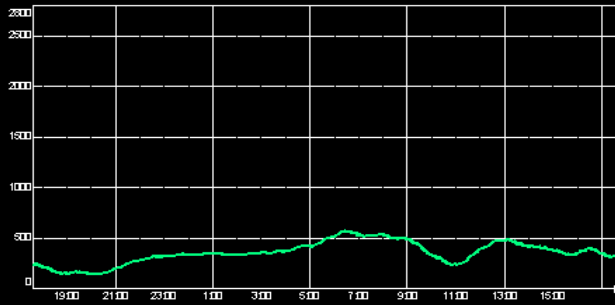
Project 1: Wind Display



PI Wind Display

MISO MKT

319



08/08 17:37:53

10min up/down 1

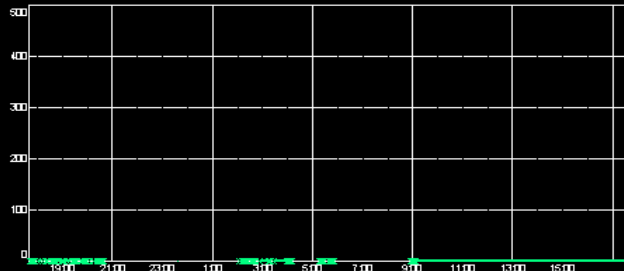
60min up/down -64

All_Time_Peak 6/28/2008 : 2307

Max 60min chg up/down: 524/-525

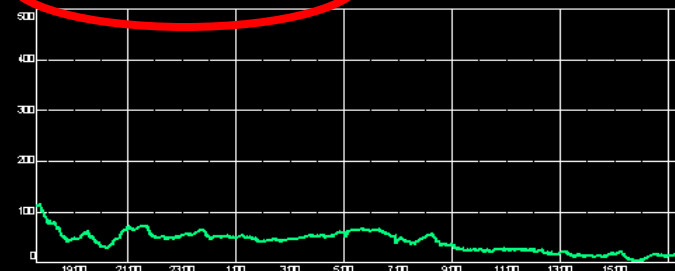
Central Region

0



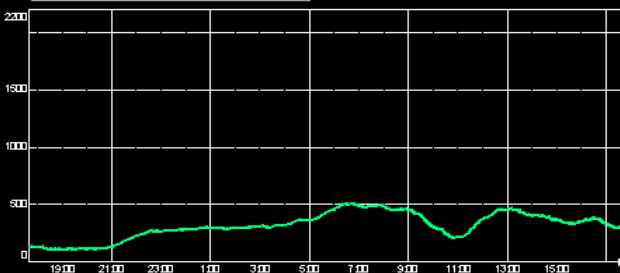
East Region

23



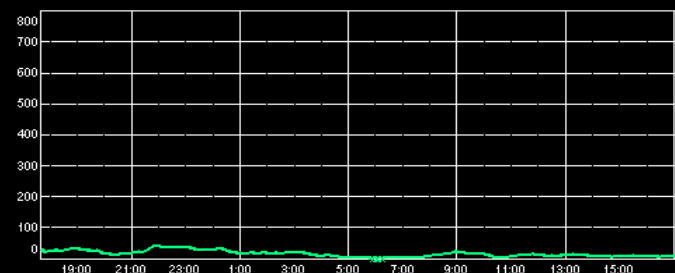
West Region

297



MEC BA

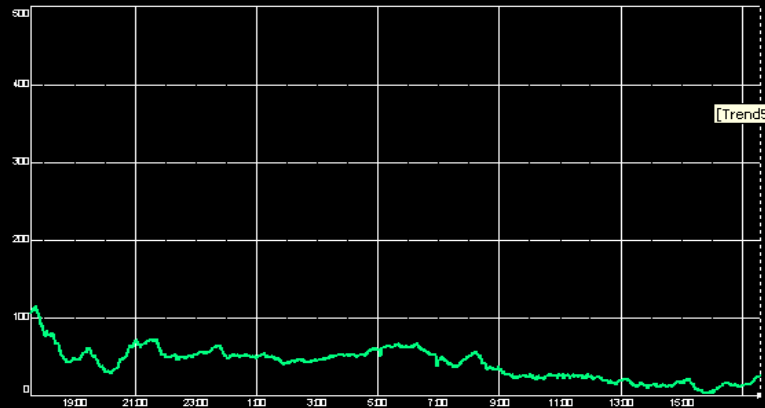
1



East Region Wind Points

East Region Wind

22.5820



Back to Main

Area	Plant	UnitName	CurrentValue	Max Value
ALTE	EDEN0000	ALTE EDEN0000 MONTFORT	-0.02485	1
DECO	G526	DECO G526 HVSTWIND	2.13995	52.8
DECO	BADAX	DECO_BADAX UN_NB_WD	0	24
MGE	LRR	MGE LRR GTOT	0	11.2
NIPS	ORION	NIPS ORION BENTNC_WF_CIN	0.91524	100.5
NIPS	ORION	NIPS ORION BENTNC_WF_SIGE	0.30107	30
WEC	BLUSKYGF	WEC BLUSKYGF BLUSKYGF_UNIT	2.40742	145.2
WEC	JOU_WEC	WEC JOU_WEC MONTFORT_JOU	0	25
WPS	FORWARD1	WPS FORWARD1 FORWARDEC_ALTE	3.55991	10
WPS	FORWARD1	WPS FORWARD1 FORWARDEC_MGE	2.13595	16.5
WPS	FORWARD1	WPS FORWARD1 FORWARDEC_WPPI	3.55991	27.5
WPS	FORWARD1	WPS FORWARD1 FORWARDEC_WPS	7.44345	27.5

Wind Flat Lined

MISO MKT

313

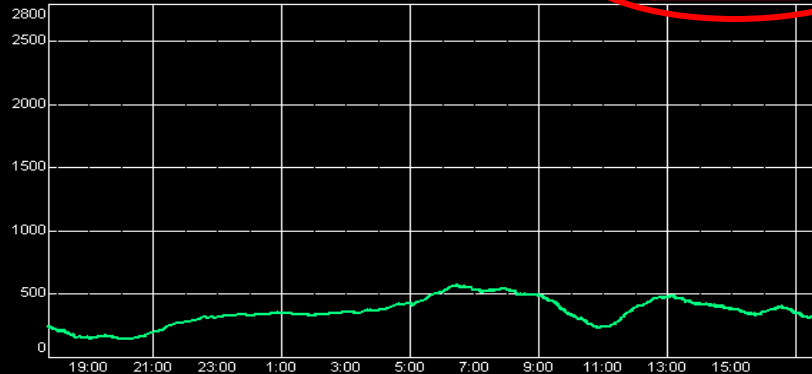
08/08 17:45:03

10min up/down -2

60min up/down -77

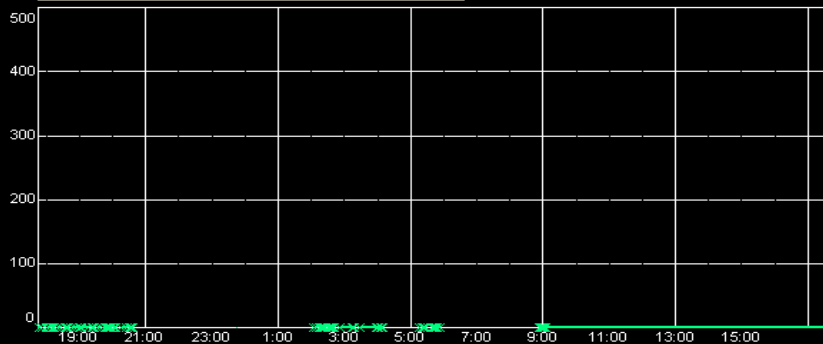
All_Time_Peak 8/8/20

Max 60min chg up/down

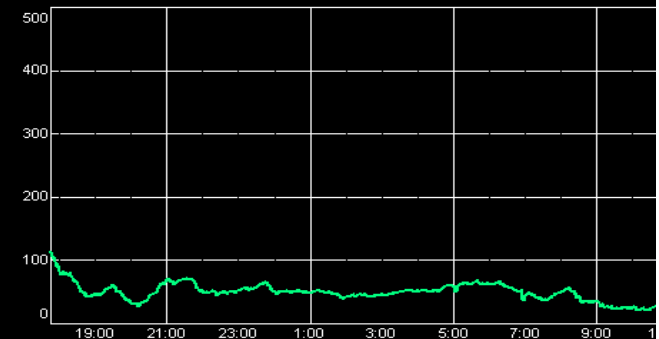


Central Region

0



East Region



West Region

291

MEC BA

Project 2: Peak Load Tool

MISO Load Totals

MISO Peak Load	136520	07/31/2006 13:54
Yesterday's Peak	94957	08/06/2008 09:07
Today's Peak	85644	08/08/2008 09:57
Year-to-date Peak	116180	07/16/2008 14:58
Month-to-date-Peak	114365	08/01/2008 15:50

MISO Central Load Totals

Central Peak Load	45560	07/25/2005 14:26
Yesterday's Peak	26265	08/06/2008 09:07
Today's Peak	23490	08/08/2008 09:55
Year-to-date Peak	34983	08/04/2008 17:02
Month-to-date-Peak	34983	08/04/2008 17:02

MISO East Load Totals

East Peak Load	52368	07/31/2006 12:22
Yesterday's Peak	38054	08/06/2008 09:07
Today's Peak	33719	08/08/2008 09:57
Year-to-date Peak	46920	07/17/2008 15:50
Month-to-date-Peak	45539	08/05/2008 15:24

MISO West Load Totals

West Peak Load	40178	07/17/2007 12:59
Yesterday's Peak	29742	08/06/2008 09:03
Today's Peak	28466	08/08/2008 09:57

Start

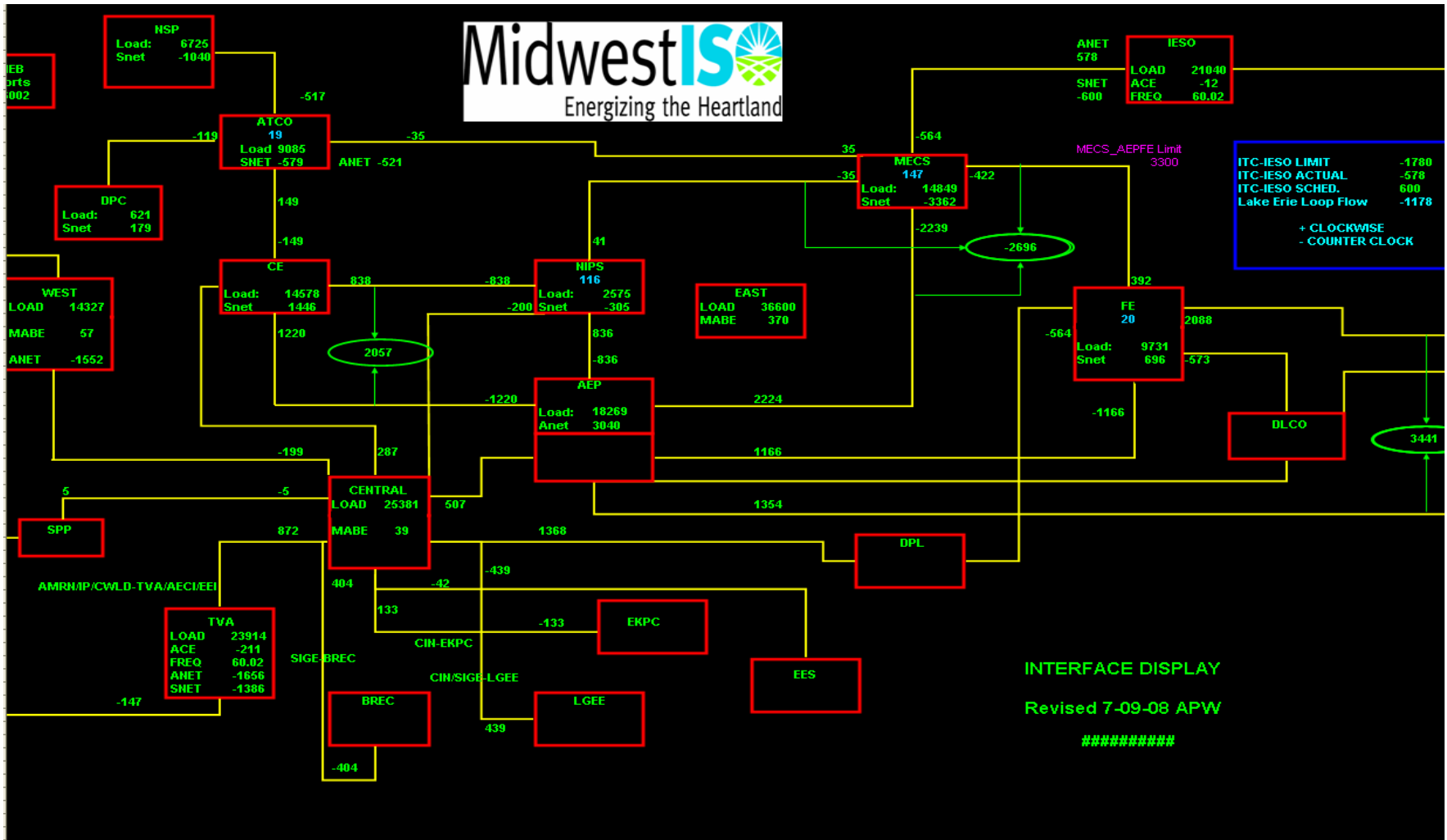
Stopped

Stop

Control Areas

Central Load	27565
East Load	34622
West Market	15431
Total Load	95105
West Load	32981
Market Load	77618

Project 3: Interface Display



MISO MKT	
LOAD	76891
TERR	212
FREQ	60.02
SFREQ	60
ANET	-5430
SNET	5642

MHEX-S
1557

MWEX
241

WI LOAD
9102

MECS LD
13858

IESO	
LOAD	18625
ACE	-75
FREQ	60.01

WEST LOAD	
LOAD	15317

NYISO	
LOAD	22495
ACE	168
FREQ	60.01

MECS-IMO
-1587

RAUN-LAKEF
253

ARN HAZ
383

SW_WI
767

SE_WI
-272

MECS-AEP
-314

MECS-FE
549

FE-PJM
1412

AEP-PJM
341

PJM	
LOAD	98978
ACE	65
FREQ	60.02

EAST LOAD	
LOAD	34267

SID-BUNS-EUG
-16

CENTRAL LOAD	
LOAD	27307

WCASEY-BRE
-401

CIN-LGEE
-163

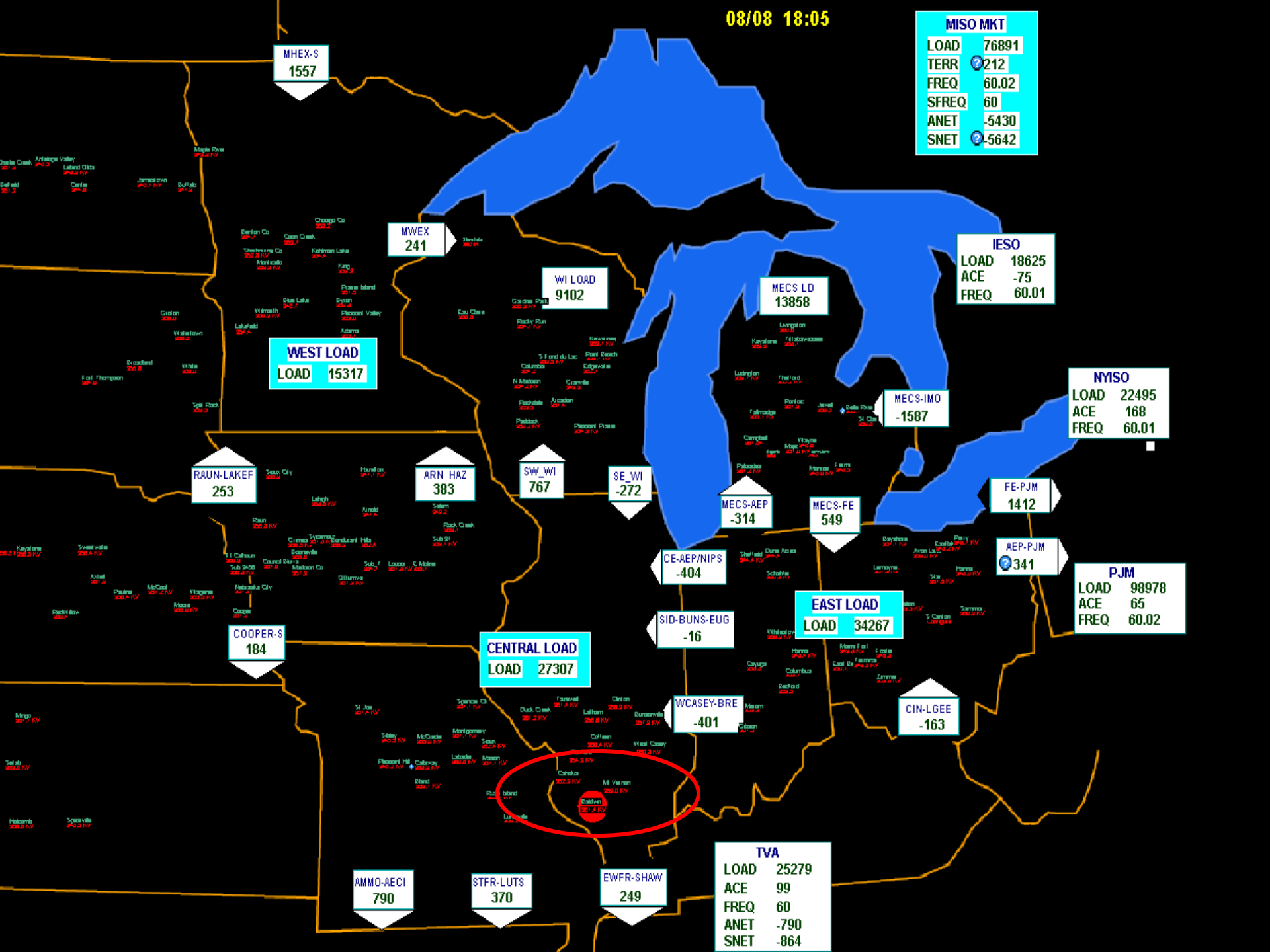
COOPER-S
184

AMMO-AECI
790

STFR-LUTS
370

EWFR-SHAW
249

TVA	
LOAD	25279
ACE	99
FREQ	60
ANET	-790
SNET	-864



08/12 18:05

MISO MKT	
LOAD	78079
TERR	68
FREQ	60.01
SFREQ	60
ANET	-5987
SNET	-6055

IESO	
LOAD	19204
ACE	5
FREQ	60.01

IESO-NYISO	
SNET	81
ANET	-105

LAKE ERIE LOOP FLOW	
LIMIT	1860
ANET	1155
SNET	1129
LOOP FLOW	25

NYISO	
LOAD	22771
ACE	439
FREQ	60.01

NYISO-PJM	
SNET	355
ANET	0

PJM	
LOAD	98950
ACE	331
FREQ	60.01

MECS-IMO	
LOAD	-1125

FE-PJM	
LOAD	909

AEP-PJM	
LOAD	1065

EAST LOAD	
LOAD	35658

MECS-AEP	
LOAD	-312

MECS-FE	
LOAD	546

CE-AEP/NIPS	
LOAD	870

SID-BUNS-EUG	
LOAD	145

CENTRAL LOAD	
LOAD	27173

WI LOAD	
LOAD	9229

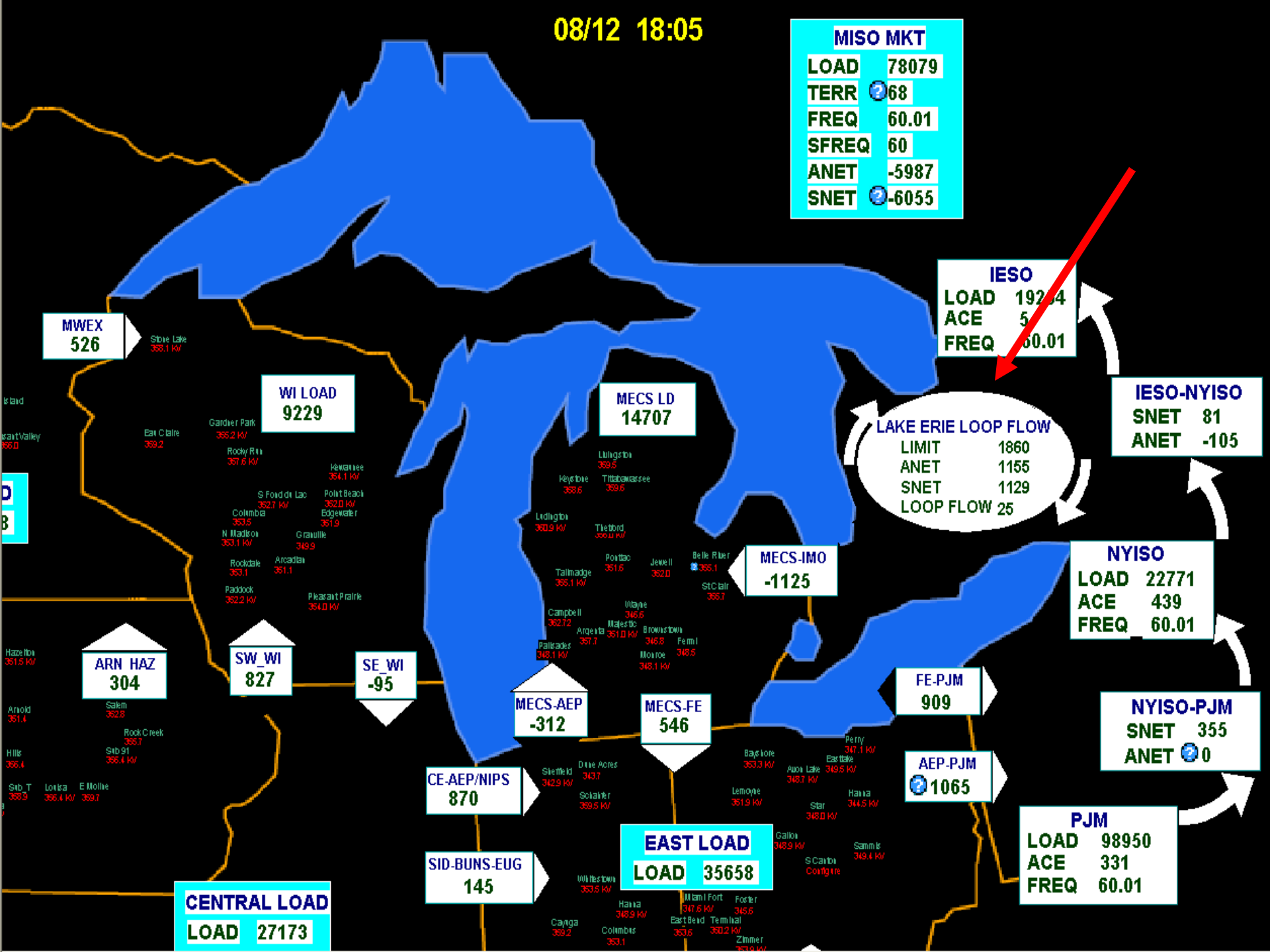
MECS LD	
LOAD	14707

MWEX	
LOAD	526

ARN HAZ	
LOAD	304

SW_WI	
LOAD	827

SE_WI	
LOAD	-95



Also...

- FERC Daily Report
 - Federal Energy Regulatory Commission
- 8:30 Daily Operations Performance Review
 - Daily Score Card
- Life Lessons Series
 - Every Thursday

Challenges

- Understanding the complexities of Real-time Operations
- Understanding Transmission System Topology
- Learning PI Systems and making PI Calculations
- Programming in Visual Basic for Applications (VBA)

Benefits

- Learned about the Power industry
 - Generation and Transmission
- Learned Responsibility and how my projects fit into the company as a whole
- Learned to Program in VBA
- Helped me Figure out what field of Engineering I preferred

Take Away...

- ASK! ASK! ASK!
- Midwest ISO Cornerstones
 - Customer Service
 - Effective Communication
 - Operational Excellence