

E.H. Pechan & Associates, Inc.

Ozone Exceedances and ISO Load Forecasts in the OTC

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HEDD Data Needs

- ❖ Data to forecast expected ozone exceedances
 - » Indicator for HEDD units to turn on controls
- ❖ Need reliable data with at least one day lead-time
- ❖ ISO load forecasts are a potential indicator

ISOs within OTC

❖ PJM

- » Includes DC, Delaware, Maryland, New Jersey, Pennsylvania, Northern Virginia

❖ ISO-NE

- » Includes Connecticut, Massachusetts, Rhode Island

❖ NYISO

- » Includes New York

Data Available from PJM

- ❖ Hourly load data for each of the 7 systems within PJM
 - » Day-ahead forecast
- ❖ Issue Max Generation Alerts
- ❖ Archived data available

Example PJM Max Emergency Generation Alert

Max Emerg Gen Alert for Mid-Atlantic - Region
As of 20:45 hours, a Maximum Emergency
Generation Alert has been issued for 08/03/06
Maximum Emergency Generation has been called
into the operating capacity.
Additional Comments: Load: 138,371 MW Reserve
Objective: 10,607 MW Estimated Reserves: 8,927
MW without max emergency

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PJM Max Generation Alerts vs. Ozone Exceedances

- ❖ 2005 Ozone Season—PJM
 - » Max generation alerts issued for 15 days
 - » 12 of these days were ozone exceedance days
 - » 22 total ozone exceedance days in PJM OTC states in 2005

Data Available from ISO-NE

- ❖ 2-day forecast
 - » Updated daily by 10 AM
 - » Systemwide hourly load forecast
- ❖ 7-day forecast
 - » Includes weather, generating capacity, peak demand
- ❖ OP#4 Alerts as needed
- ❖ Archived forecasts available

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ISO-NE OP#4

- ❖ 16-step procedure
- ❖ Implemented when reserve margins dip below maintenance requirements
 - » Step 1: Power Caution
 - Appeal to users to conserve energy; issue press releases to media
 - » Step 9: Power Watch
 - » Step 15: Power Warning

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ISO-NE—OP#4 Steps Implemented

❖ 2006

- » Issued Power Watch Aug 1 and Aug 2
- » Issued Power Caution June 19

❖ 2005

- » Issued Power Caution Oct 25
- » Issued Power Watch July 27

❖ 2004

- » Issued Power Caution Aug 20

Example ISO-NE OP#4 Implementation

June 19, 2006 – BOSTON AREA ONLY			
Status	OP/4 Action	Time IN	Time OUT
CAUTION	Action 1	6/19/2006 16:50	6/20/2006 11:00
CAUTION	Action 2	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 3	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 4	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 5	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 6		
CAUTION	Action 7	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 8	6/19/2006 16:50	6/19/2006 21:00
WATCH	Action 9		
CAUTION	Action 10	6/19/2006 16:50	6/19/2006 21:00
CAUTION	Action 11		
CAUTION	Action 12	6/19/2006 16:50	6/19/2006 20:00
CAUTION	Action 13	6/19/2006 16:50	6/19/2006 20:00
CAUTION	Action 14		
WARNING	Action 15		

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ISO-NE

- ❖ Issues ozone alerts based on 2-day forecast
- ❖ Separate from OP#4 actions
- ❖ In May 2006, ozone alert issued when load forecast exceeded 22,000 MW

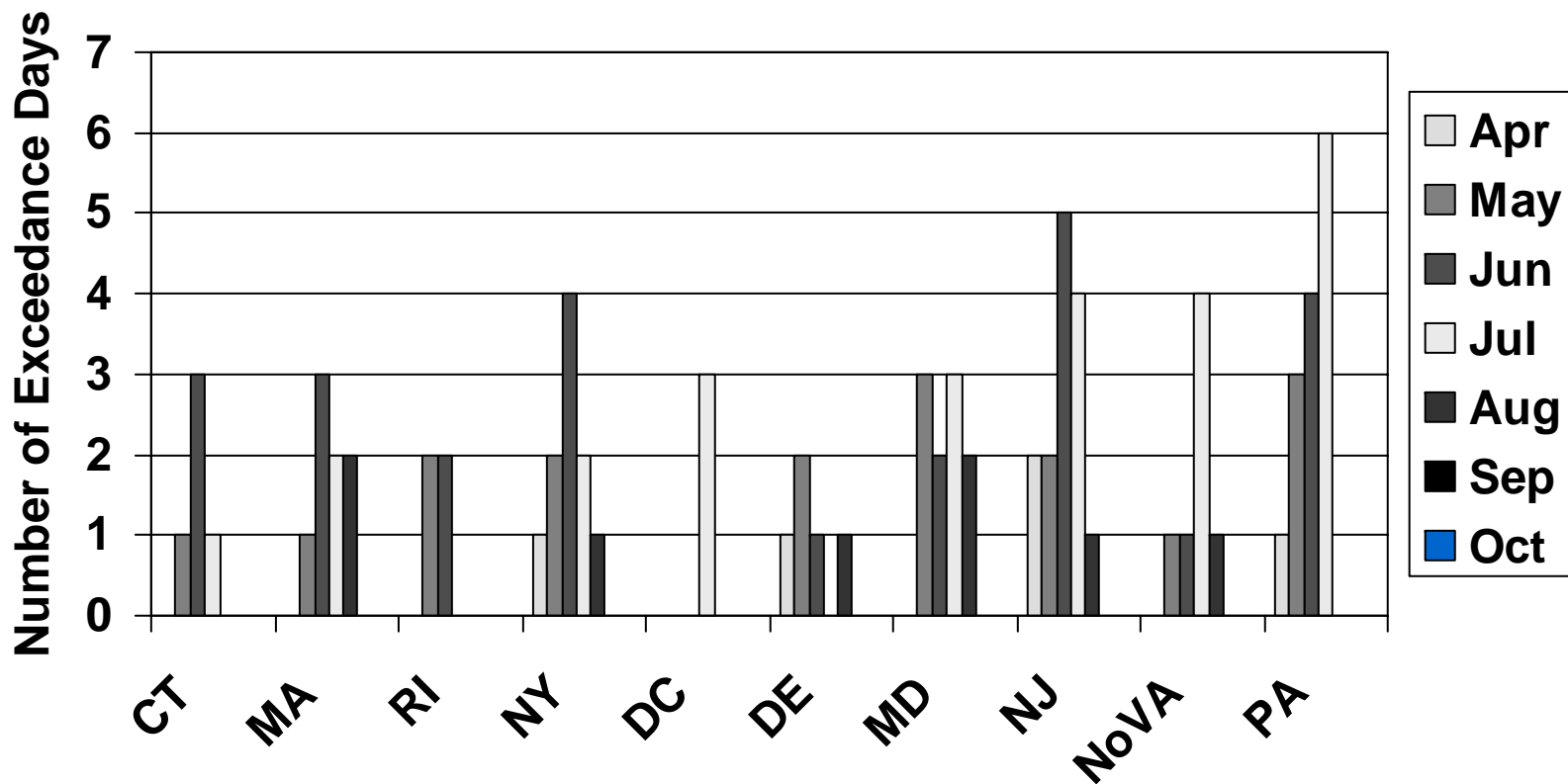
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Data Available from NYISO

- ❖ Daily load forecast for each of next 6 days
 - » Forecasts load by hour for 11 regions in NYISO
- ❖ Rarely need alert system
 - » Integrate additional generation needs into modeling
- ❖ Archived forecasts available

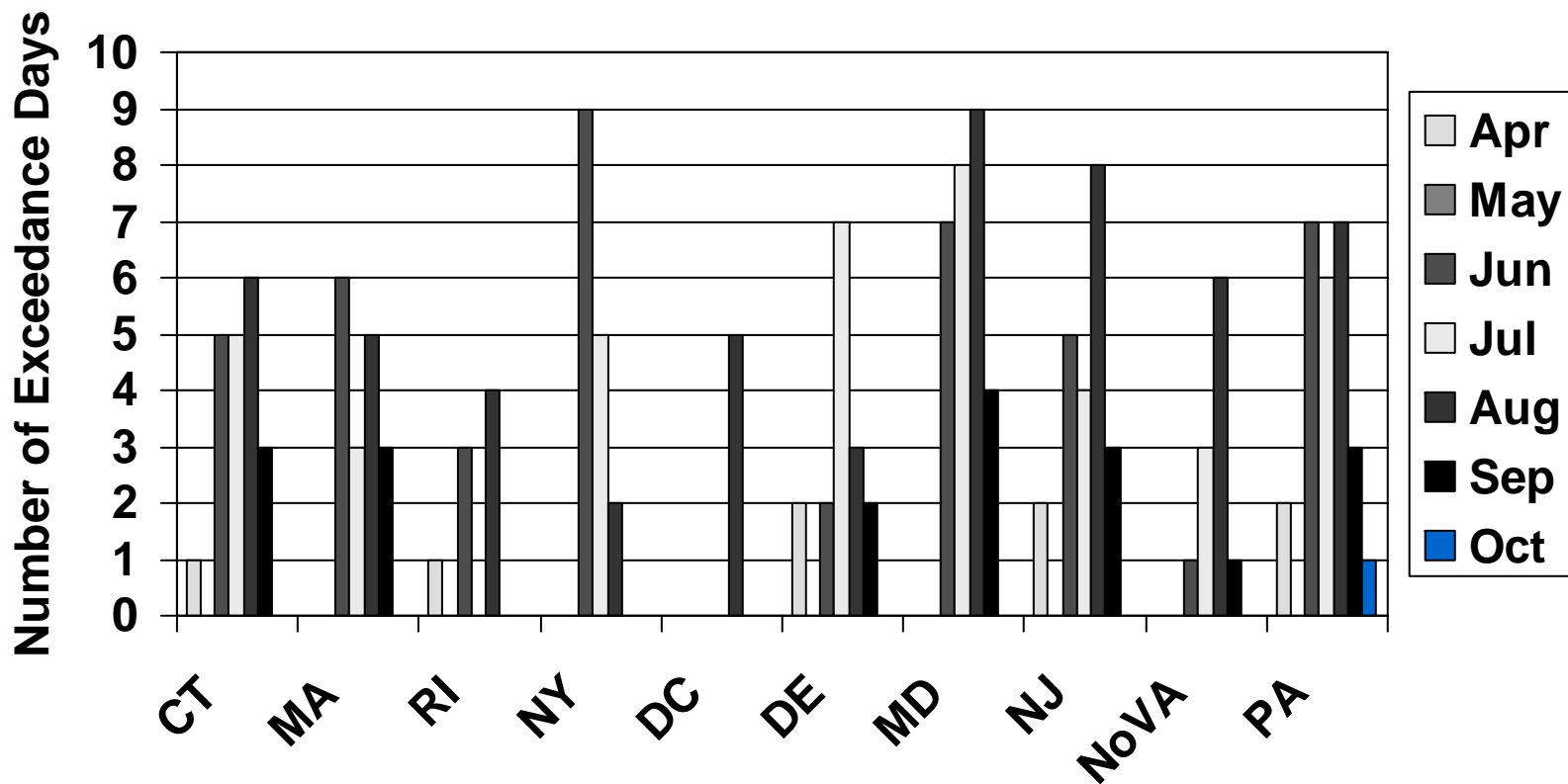
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2004 8-hour Ozone Exceedances



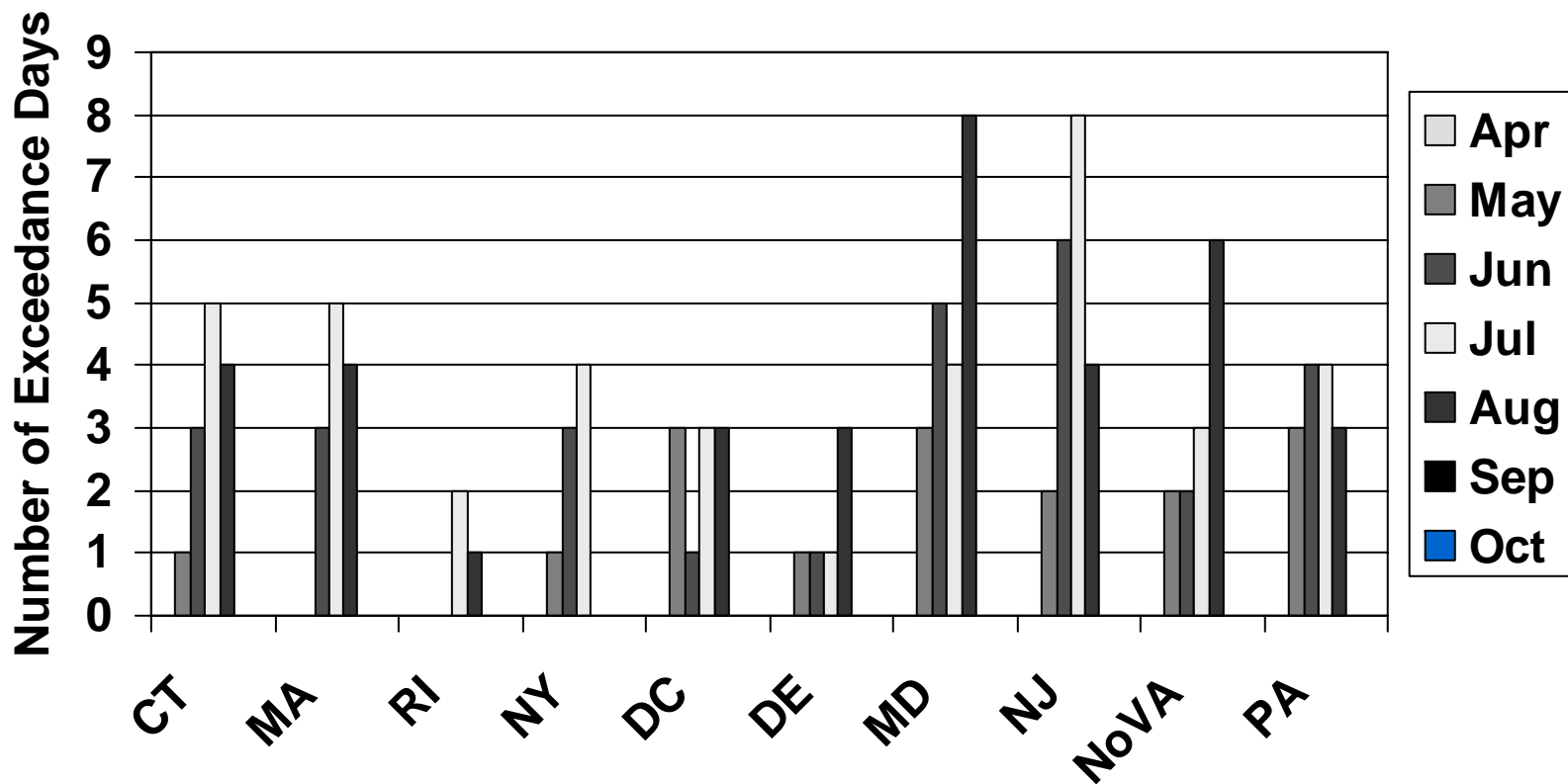
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2005 8-hour Ozone Exceedances



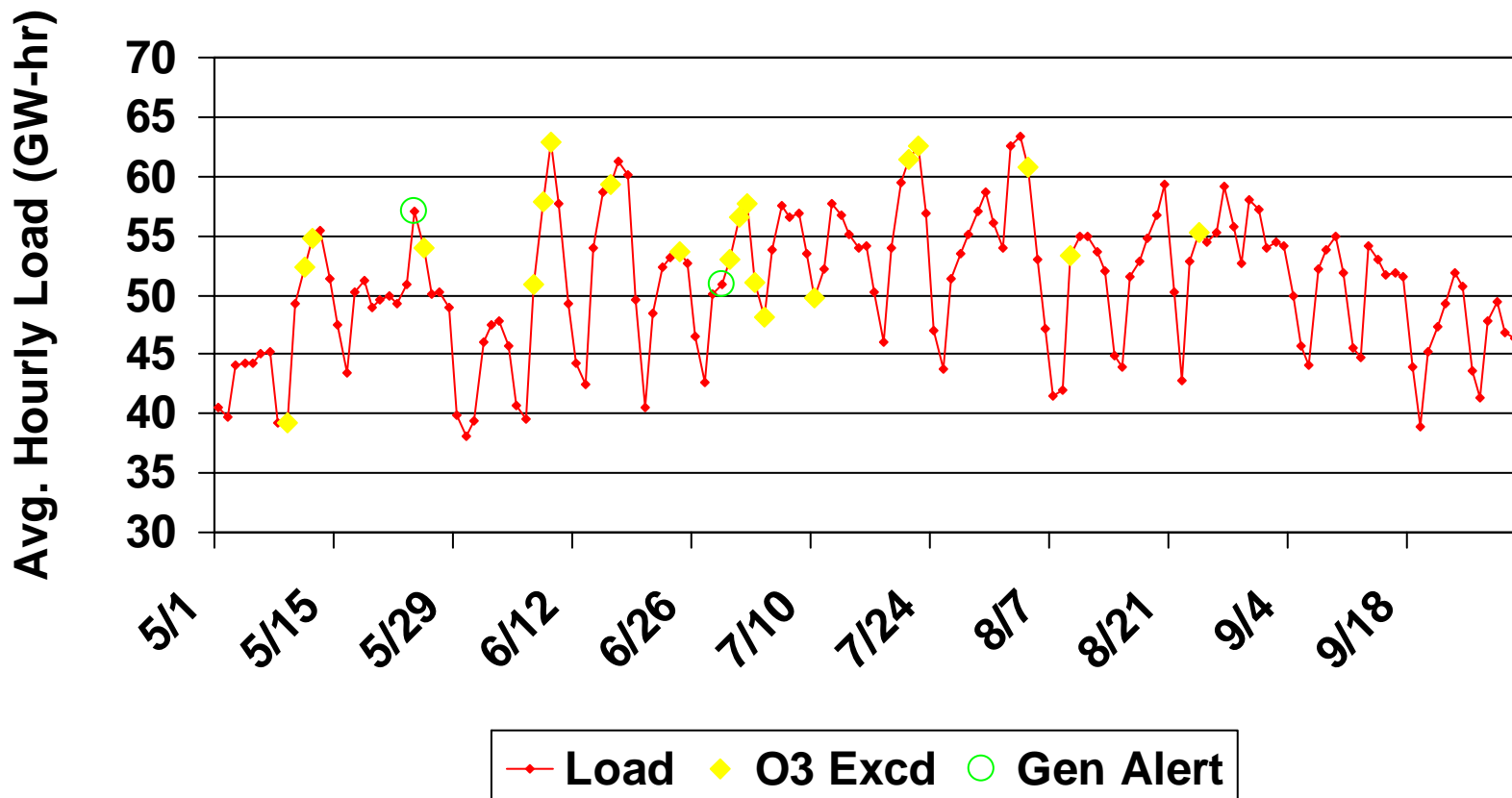
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2006 8-hour Ozone Exceedances



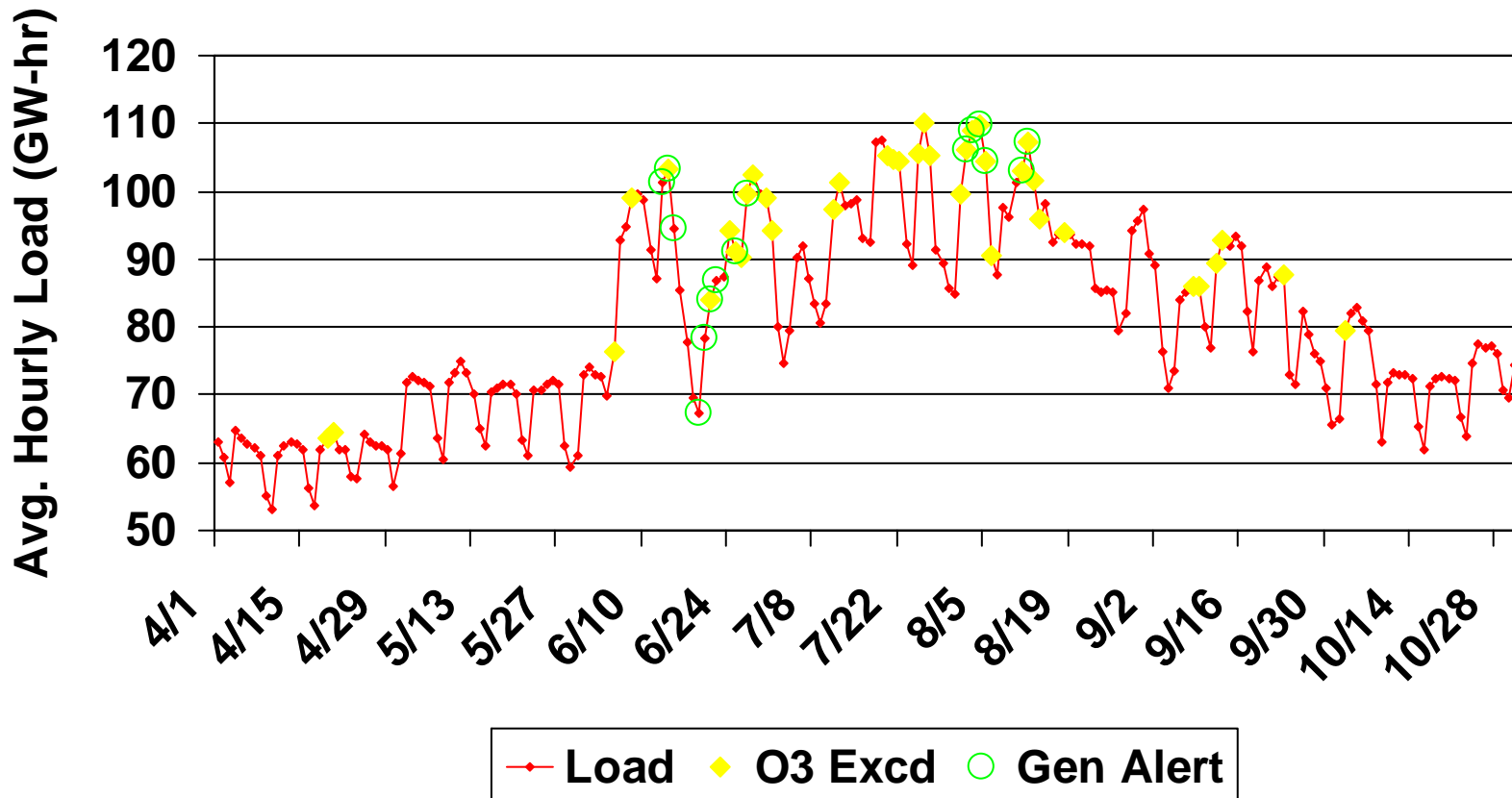
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PJM 2004 Average Hourly Load Forecast by Day



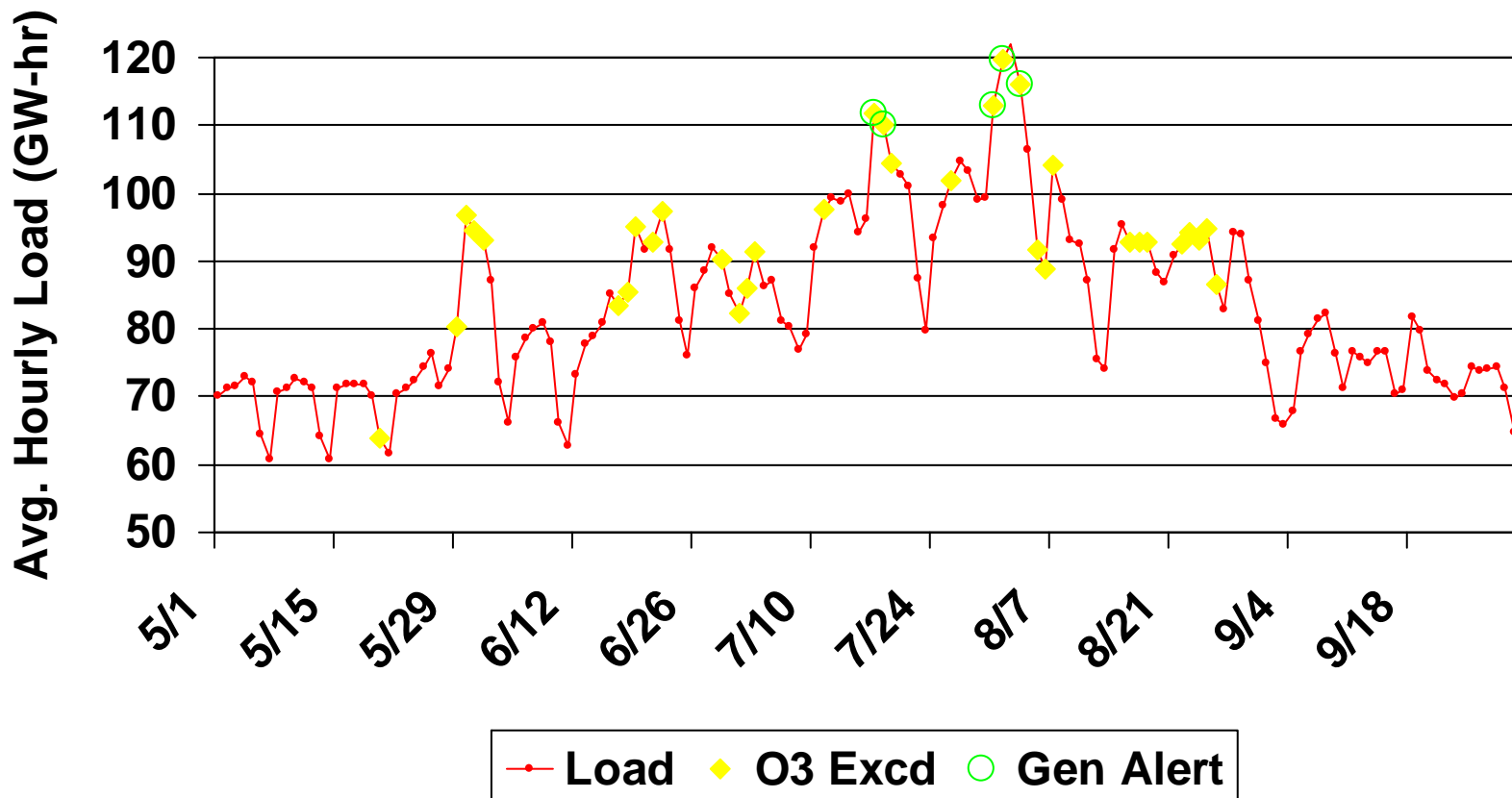
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PJM 2005 Average Hourly Load by Day



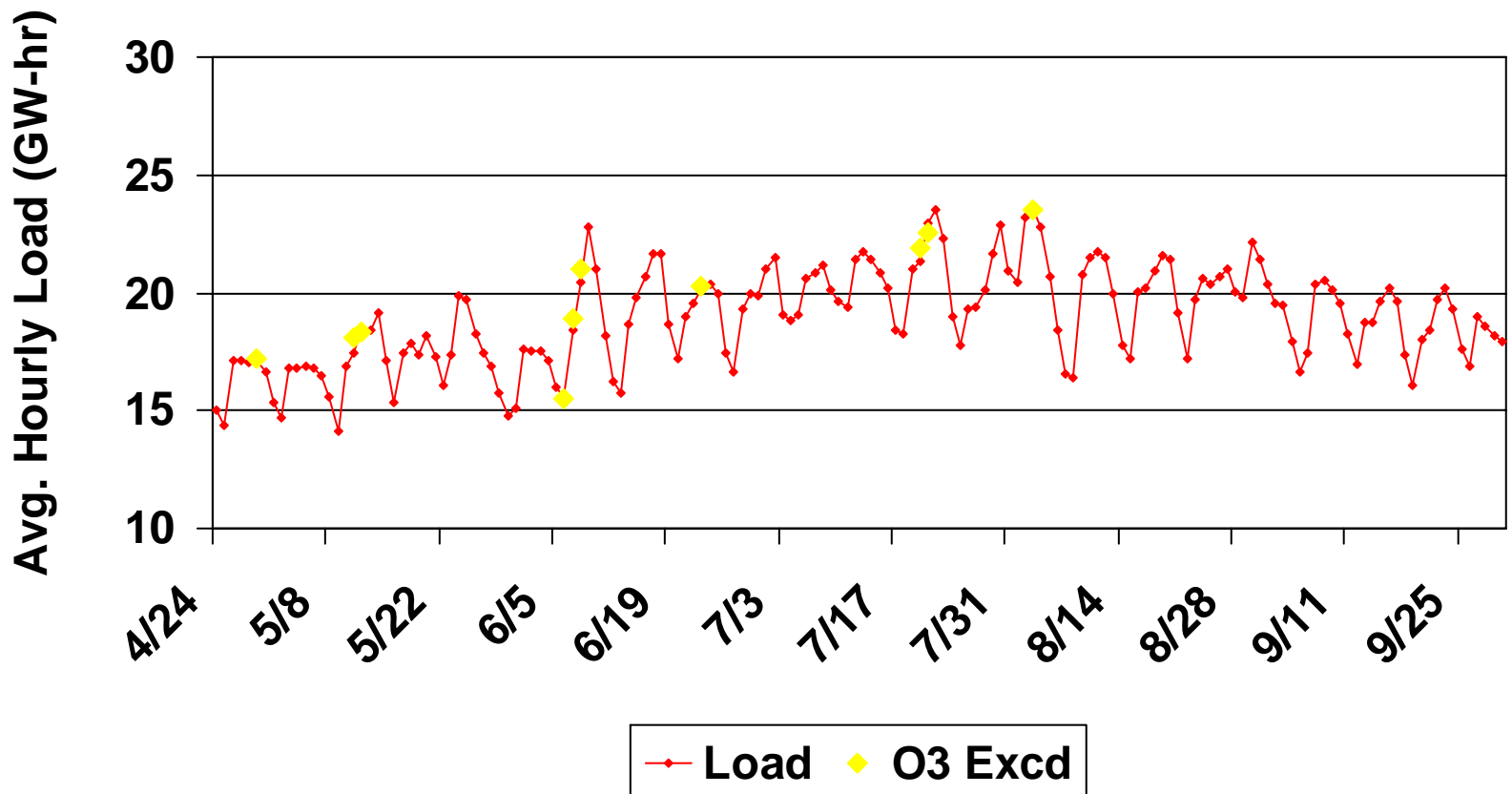
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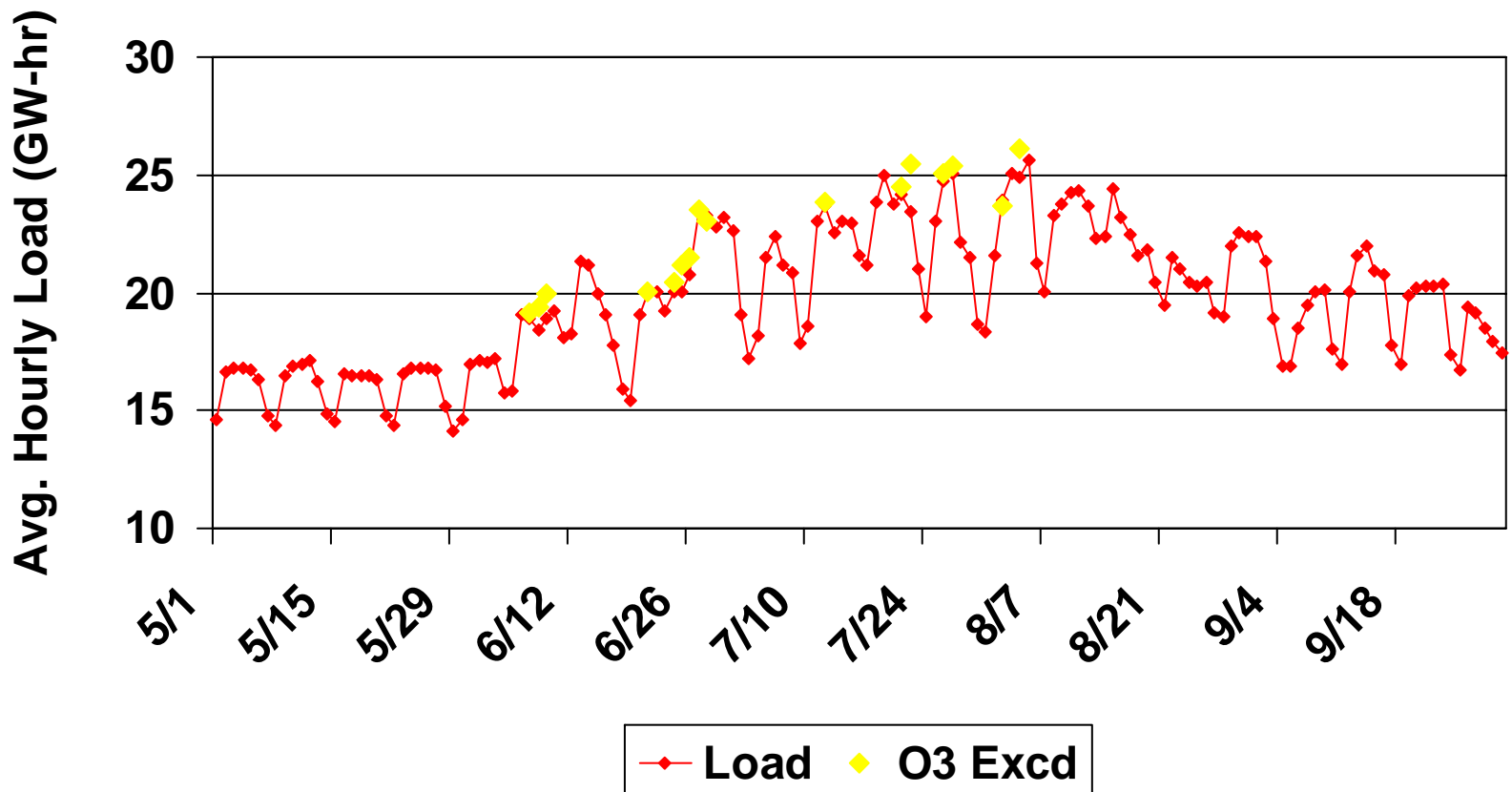
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NYISO 2004 Average Hourly 2-day Load Forecast by Day



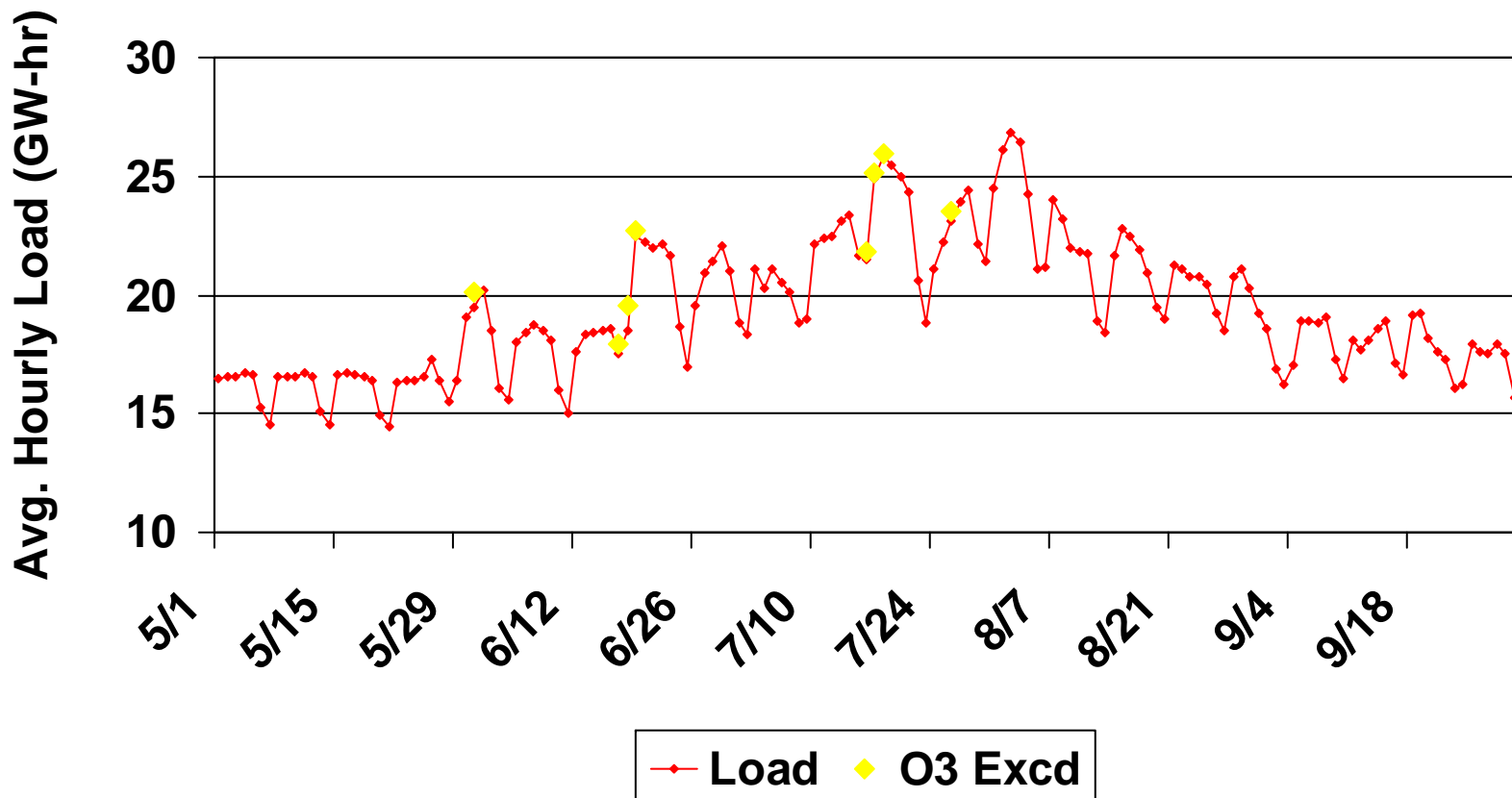
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NYISO 2005 Average Hourly 2-day Load Forecast by Day



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NYISO 2006 Average Hourly 2-day Forecast Load by Day



Questions

- ❖ Can ISO load forecast data be used to predict HEDDs?
- ❖ What is appropriate cutoff for defining HEDD?

Challenges

- ❖ Find balance between declaring minimum number of HEDDs necessary to prevent ozone exceedance
- ❖ Not all HEDDs are indicative of ozone exceedances
- ❖ Need system to be as geographically specific as possible