

# *New Entrant Peaking Unit Generating Technology Assumptions*

Presentation to NYISO Installed Capacity Working Group

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# Topics

- Emissions Controls/Generation Technology
- Dual Fuel Capability/Gas Transportation Tariff
- Other Issues
  - *Heat Rate*
  - *Major Maintenance Intervals*
  - *Switchyard Costs*

# *Emissions Controls*

- Discussed emissions control requirements with NY DEC staff
- DEC is processing air permits for two LMS100 units to come on-line in the summer of 2008
  - *LM6000s and LMS100s can be fitted with SCRs and have no limits on operating hours*
- Exhaust temperature of Frame 7 units in simple cycle mode is generally too high for SCRs
  - *Frame 7 units without an SCR can be permitted with limitations on operating hours due to higher emission rates*
- No CO/VOC catalyst is required (a fairly recent change)

# LMS100 Projects

<u>Owner</u>	<u>Name</u>	<u>City/County</u>	<u>State</u>		<u>Cooling</u>	<u>Year</u>
Basin Electric Power Cooperative	Groton Generating Station	Groton	SD	2	?	2006/?
East Kentucky Power Cooperative	J. K. Smith Gen. Sta. Units 8-12	Clark County	KY	5	?	2007-8
EPCOR	Clover Bar Gen. Station	Edmonton	Alberta	2	?	2008/10
AES	Highgrove	Grand Terrace	CA	3	wet	2008
Edison Mission Energy	Sun Valley Energy Project	Riverside	CA	5	wet	2008
Panoche Energy Center LLC	Panoche Energy Center	Fresno	CA	4	wet	2009
Bullard Energy Center LLC	Bullard Energy Center	Fresno	CA	2	wet	2009
Edison Mission Energy	Walnut Creek Energy Park	Los Angeles	CA	5	wet	2009
<b>confidential</b>	<b>confidential</b>		<b>NY</b>	<b>10</b>	<b>?</b>	<b>2008-10</b>
			Total	38		

- We found 38 LMS100 projects proposed or underway in North America.
  - One, in South Dakota, is in operation. The owner of that unit has ordered a second one.
  - Half of those found are in CA; a quarter are in NY.
  - Unable to determine how many of the proposed projects are firm orders.

# Peaking Technology Choices

	<b>New York</b>	<b>California</b>
	<b>Capacity (MW)</b>	<b>Capacity (MW)</b>
LM6000	133 9%	93 4%
LMS100	1,073 71%	2,100 81%
Other/Unknown	312 21%	399 15%
Total	1,518	2,592

- We reviewed the choice of simple cycle technology by applicants in both New York and California.
  - 70-80 percent of the proposed peaking MWs in either state are LMS100s.
  - There are no simple cycle frame 7 machines in the NYISO interconnection queue or proposed to the California Energy Commission for the 2008-10 time period.

# *Why the LMS100?*

- Three reasons commonly cited:
  - *Operating efficiency (heat rate in mid-8000 Btu/kWh HHV)*
  - *Lower NOx emissions than the LM6000 on lbs/kWh basis*
  - *Lower cost on \$/kW basis*
- Even though there is limited operating history with LMS100s, most applicants are apparently assuming that any issues with the technology are resolved without significantly diminishing the benefits
- A number of recently published planning studies/IRPs have included the LMS100 and noted its advantages:
  - *Pasadena Water & Power*
  - *Northwest Power Planning Council*
  - *Portland General Electric.*

# *Technology for New Entrant Peaker*

- The LM6000 and LMS100, both with SCRs, will be evaluated at each of 5 sites:

<b>Load Zone</b>	<b>Labor Basis</b>	<b>Material Basis</b>
C – Central	Onondaga County	Syracuse
F - Capital	Albany County	Albany
G – Hudson Valley	Dutchess County	Albany (Best Available)
J – New York City	New York County	New York City
K – Long Island	Suffolk County	Riverhead

# *No Dual-Fuel Capability*

- Not consistent with the definition of a peaking unit (lowest-capital cost, highest operating cost unit which is economically practical)
  - *Adding dual-fuel capability simultaneously adds capital cost while lowering operating cost.*
- There is no mandate to include dual-fuel capability in the design
  - *Current rules do not require such capability*
  - *Gas availability is more likely a problem in winter when reliability is less an issue*
- Implementing dual fuel capability would require extensive, unnecessary analysis.
  - *Affects design and operational simulation to address emissions.*
- Ancillary service and energy market revenues will be adjusted to include the effects of periods in which gas availability is restricted.



# *Other Issues*

- LM6000 and LMS100 maintenance intervals are based on operating hours
  - *Development of scenarios for factoring of starts is unnecessary*
- Developed design basis for switchyard by review of information provided by applicants in the interconnection queue
- Continuing review of LM6000 heat rate assumption