CC Modeling

Status and Planning
MSWG
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CC Modeling Plan

1. Seek input from CC owner/operators to fully understand characteristics and limitations of units.

We are here → 1.a Report results of (1) to MPs

   - » Spoken with 6 organizations over the past several weeks

2. Develop Feasible alternatives in conjunction with ABB
   - – Scheduling (optimizing) the operating state and/or
   - – Detecting the operating state and making allowances for physical limitations.

   2.a Report results of (2) to MPs.

CC Modeling Plan

3. Select model characteristics in conjunction with MPs. (These may be obvious choices)

4. Implementation, tariff filing, testing and deployment.

CC Characteristics

- Three basic types of CC configurations in New York.
  - 1CT/HRSG : 1ST (2 generators)
  - 2CT/HRSG : 1ST (3 generators)
  - 3CT/HRSG : 1ST (4 generators)

CT:	Combustion Turbine
ST:	Steam Turbine
HRSG:	Heat Recovery Steam Generator

Operating States

- Startup / Warming HRSG
  - No control capability
  - Synchronized and producing energy at a fairly low level
  - May take several hours
  - Must warm HRSG and ST slowly
- Normal Operation
  - Able to control output
  - Control range approximately top 30 % of unit capability – (Varies)
  - Fairly responsive within its control range

Operating States

- Duct Firing – (additional fuel injected into HRSG)
  - Increases output
  - Less ability to follow a control/dispatch signal

- Fuel oil (dual fuel units only) may limit the ability of CC units to be on control.

Transitions

- Units with a (2 on 1) or (3 on 1) architecture can operate in a number of configurations.
- Each transition that adds a CT requires a warm-up period for the HRSG.
  - Limited control capability during the transition
  - Duration may be several hours in length

Physical Parameters

- Ramp rate and control range are state dependent
- Many transition require hold periods
- Modeling of minimum run times, maximum run times, & minimum down times is very complicated.

Economic Parameters

- Incremental cost depends on state
  - Startup and HRSG warming are very inefficient (high incremental heat rate (IHR))
  - Change in IHR is relatively small when another CT is brought on
  - Duct firing is relatively inefficient (high IHR)

Pain Points

- Legacy rules on performance and penalties should be examined for relief.
- Major issue – startup period management
  - Non-payment for energy during startup and warming, or
  - Accumulations of performance penalties when attempting to utilize RT market to gain payment for startup energy.

Short-term plan

- Initial draft COO - Year-end ’04
- COO completion ISO Staff/MSWG - Jan/Feb
- Complete COO - late February/March
- Requirements approval and Implementation Start-up
  - Per SMD2 resource availability
  - Target mid-summer ’05
- Completion/deployment - TBD