



October 20, 2010

Kathleen Truesdell
 Air Quality Engineer
 Bay Area Air Quality Management District
 939 Ellis Street
 San Francisco, CA 94109

Subject: Contra Costa Generating Station – Startup and Shutdown Durations and Emissions

Dear Kathleen,

The Bay Area Air Quality Management District (BAAQMD) requested the basis for the startup and shutdown durations and emissions listed in Table 1, which were provided to the BAAQMD by Radback Energy on behalf of Contra Costa Generating Station LLC (CCGS) for the Oakley Generating Station (OGS).

TABLE 1
 CCGS LLC's Proposed Startup and Shutdown Durations and Emissions

	Hot Start	Warm Start	Cold Start	Shutdown
Duration, min.	30	30	90	30
NO _x , lbs as NO ₂	22	22	96	39
CO, lbs	85	85	360	140
POC, lbs as CH ₄	31	31	67	17

These startup and shutdown durations and NO_x, CO, and POC emissions were based on estimates provided to Radback Energy by General Electric (GE) specifically for the OGS. GE's estimates are shown in Table 2. These estimates reflect GE's 207FA Rapid Response Combined Cycle plant with gas turbine Purge Credit applied.

TABLE 2
 GE's Estimated Startup and Shutdown Durations and Emissions

	Hot Start	Warm Start	Cold Start	Shutdown
Duration, min.	14	14	45	30
NO _x , lbs as NO ₂	22	22	96	39
CO, lbs	85	85	360	140
POC, lbs as CH ₄	31	31	67	17

Radback Energy is relying on GE's estimates because:

- The 7FA.05 is essentially a new unit from an emissions perspective (i.e. approximately 15% more mass flow than the previous generation of 7FA), thus startup and shutdown emissions from previous 7FA experience would not necessarily be applicable.
- The OGS will incorporate GE's Rapid Response design, the purpose of which is to provide accelerated startups allowing the plant to provide non-spinning reserve (i.e. generation output in 10 minutes) and also to reduce startup emissions. As such, the startup and shutdown emissions from previous 7FA experience would not be useful even if adjustments were made for the increased mass flow.
- GE will be providing an engineered equipment package (EEP) which will include the gas turbines, steam turbine, heat recovery steam generators, distributed control system, CEMS, and various steam turbine bypass valves. By providing the EEP, GE is able to assure that the plant will be capable of the performance offered by Rapid Response (including startup times and emissions).

GE estimated the startup and shutdown emissions using proprietary curves of gas turbine load versus time and gas turbine NO_x, CO, and POC emissions versus load. Thus, for each minute during a startup or shutdown, using the known load, GE determined the appropriate NO_x, CO, and POC emission rate (lb/hr) applicable to that given minute. The one-minute emissions estimates were then summed to determine the total emissions produced by the gas turbine during the subject startup or shutdown. A conservative estimate of the emissions reduction resulting from operation of the SCR or CO catalyst, as appropriate, was then made to arrive at the total startup or shutdown emissions. The startup durations provided by GE represent the time from combustor ignition to minimum emissions compliance load (MECL). The MECL varies from 49 to 53% of gas turbine load, depending upon compressor inlet temperature. The shutdown duration provided by GE represents the time from MECL to flame out. All values are per gas turbine per event.

For the startup durations, Radback Energy doubled GE's durations to arrive at the proposed permit limits.

If you have any questions or require additional information, please do not hesitate to call me at 925/820-5222 (office) or 925/570-0835 (cell).

Yours Truly,



Jim McLucas
Senior Vice President, Engineering
Radback Energy, Inc.

cc: Jose Xavier, GE
Craig Matis, GE
Pete Bukunt, GE
Bryan Bertacchi, Radback Energy
Greg Lamberg. Radback Energy