



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
AIR AND RADIATION

Peter Haviland, Vice President  
Trigen-Syracuse Energy Corp.  
56 Industrial Drive  
Syracuse, NY 13204

Dear Mr. Haviland:

This letter is U.S. EPA's determination of applicability under 40 CFR 72.6(c) of the Acid Rain regulations for Trigen-Syracuse Energy Corporation's ("TSEC") Trigen-Syracuse Facility ("Trigen," Facility ID (ORISPL) 50651) with five identical boilers in Syracuse, New York. This determination is made in response to TSEC's letter of August 15, 2002 requesting a determination. As described below, U.S. EPA has determined that none of the five boilers is subject to the Acid Rain Program because each boiler meets the exemption provisions for cogeneration units under 40 CFR 72.6(b)(4)(i).

Background

Trigen is a powerhouse at a large industrial plant and includes five identical coal-fired boilers (BLR1 through BLR5) that share a steam header connected to two steam turbines with nameplate capacities of 79.9 MW and 9.5 MW. Construction was completed for the five boilers as follows: BLR1, 1965; BLR2, 1960; BLR3 and BLR4, 1947; and BLR5, 1948. Each boiler has a maximum design heat input capacity of 275 mmBtu/hr. Further, each boiler generates steam used first for the production of electricity, then for the production of sodium sulfite, cardboard, and kraft paper, and also for building heating, pursuant to steam sales agreements with Allied Chemical, General Chemical Corporation, and Solvay Paperboard. Although all of the boilers were built decades ago, none of them produced electricity for sale until 1991, after the completion of a refurbishment project for all five boilers and the installation of the 79.9 MW steam turbine. Electricity produced for sale by Trigen was sold exclusively to Niagara Mohawk Power Corporation ("Niagara Mohawk") pursuant to a power purchase agreement effective October 1, 1986 until June, 1998, when the agreement was

terminated by Niagara Mohawk. Trigen does not currently have a power purchase agreement and sells electricity primarily through the New York Independent System Operator.

### EPA Determination

Since each boiler burns coal and serves a generator producing electricity for sale, boilers BLR1 through BLR5 are “units,” and (unless otherwise exempt) “utility units,” as defined at 40 CFR 72.2. Further, since all five of Trigen’s boilers produce steam that is used sequentially (first at the steam turbines to produce electricity and next for a variety of industrial purposes), boilers BLR1 through BLR5 are also “cogeneration units” as defined under 40 CFR 72.2 as well. As noted earlier, the maximum design heat input capacity of boilers BLR1 through BLR5 is 275 mmBtu/hr each; therefore, the potential electrical output capacity (“PEOC”) of these boilers is 26.9 MWe each.<sup>1</sup>

The Clean Air Act includes provisions discussing in detail the conditions under which a cogeneration unit is exempt from the Acid Rain Program. See, e.g., 42 U.S.C. 7651a(17)(C) (stating that a cogeneration unit is not a utility unit if it meets certain requirements concerning the purpose of its construction and the amount of electricity that it sells); and 42 U.S.C. 7651d(g)(6)(A) (stating that Clean Air Act title IV does not apply to a qualifying cogeneration facility that meets certain conditions as of November 15, 1990). EPA interprets these provisions, and 40 CFR 72.2 and 72.6 of the regulations implementing the provisions, to provide that a cogeneration unit used to produce electricity for sale is a utility unit and thus subject to the Acid Rain Program, unless the unit meets the requirements for an exemption under 40 CFR 72.6(b).

Under 40 CFR 72.6(b)(4)(i), cogeneration units that commenced construction before November 15, 1990 and were not built for the purposes of selling annually more than 219,000 MWe-hrs of electricity and 1/3 of their PEOC are exempt from the Acid Rain Program. The regulation provides that in the absence of information about the purpose of their construction, actual sales during 1985-1987 will be treated as determinative of that purpose. Further, in order to remain exempt, such cogeneration units must continue not to sell, on a three-year rolling average basis, more than 219,000 MWe-hrs of electricity and 1/3 of their potential electrical output capacity.

Since 1/3 of the PEOC for each of the Trigen boilers is 78,546 MWe-hrs,<sup>2</sup> each boiler can sell up to 219,000 MWe-hrs annually under 40 CFR 72.6(b)(4)(i) without becoming subject to the Acid Rain Program. Because Trigen’s boilers did not begin to produce electricity for sale until 1991 (decades after they were first constructed), the purpose of these boilers was clearly to produce less than 219,000 MWe-hrs of electricity for

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<sup>1</sup> PEOC for a unit is calculated by dividing the maximum design heat input capacity in Btu/hr of the unit by 3 (reflecting the assumed efficiency of the unit), dividing again by 3,413 (reflecting the assumed heat rate), and dividing by 1,000 (converting to MWe). See 40 CFR part 72, appendix D.

<sup>2</sup> This figure is calculated by multiplying the PEOC by 8,760, the number of hours in a year, and then dividing by 3. See 40 CFR 72.6(b)(4)(i).

sale on an annual basis. Further, as discussed below, electrical sales for each of the five boilers since 1991 demonstrate that the boilers continue to remain well below the 219,000 MWe-hr threshold for cogeneration units established under 40 CFR 72.6(b)(4)(i).

Acid Rain applicability for cogeneration units is determined unit-by-unit basis based on individual-unit electrical sales. Since TSEC provided only facility-wide information on electricity produced and sold by boilers BLR1 through BLR5, U.S. EPA applied several alternative methods, as described below, to determine if electrical sales attributable to an individual boiler exceeded the 219,000 MWe-hr threshold.

## 1. Heat Input-based Apportionment

The first method employs heat input data as a means of apportioning facility-wide electrical sales among boilers at the facility.<sup>3</sup> TSEC provided annual heat input data for the facility for 1991-2003. For 1991 through 1999, U.S. EPA determined total heat input for the facility by multiplying total tons per year of coal burned by 26 mmBtu per ton to derive total heat input for each year.<sup>4</sup> For 2000 through 2003, Trigen monitored and reported heat input for each boiler using 40 CFR part 75, as required under the Ozone Transport Region and NOx Budget Programs.

U.S. EPA assumed, for the purposes of heat input-based apportionment of electrical sales, that each boiler was operated continuously for each hour of each year at maximum design heat input capacity of 275 mmBtu per hour.<sup>5</sup> By doing so, the highest possible fraction of total annual heat input for the facility is attributed to any individual boiler for any given calendar year. Since the highest possible fraction of total facility heat input that can be attributed to an individual boiler is then multiplied by total electrical sales for the facility, the highest possible electrical sales attributable to any individual boiler are calculated. For example, in 2001 the Trigen facility had total heat input of 5,688,461 mmBtu and total electrical sales of 256,311 MWe-hrs. The maximum annual heat input for an individual boiler in mmBtu for any calendar year is 2,409,000 mmBtu.<sup>6</sup> An individual

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<sup>3</sup> U.S. EPA has used heat output in prior applicability determinations to apportion facility-wide electrical sales among individual units. See Onondaga and Pinon Pine applicability determinations, dated September 25, 2002 and August 13, 1996, respectively, at <http://www.epa.gov/airmarkets/applicab/arp/index.html>.

<sup>4</sup> Assumed heat value of coal is 13,000 Btus per pound of coal, per vendor composite sampling analysis for 1991-2003.

<sup>5</sup> This is a conservative assumption that is highly unlikely to have occurred, particularly since the entire facility has a permit limit of 1,250 mmBtu/hr, which is 10% less than the design limitation of 1,375 mmBtu/hr (or 275 mmBtu/hr times 5 units).

<sup>6</sup> Maximum design heat input capacity of each boiler (275 mmBtu/hr) times the number of hours in a year (8,760 hours) equals 2,409,000 mmBtu per year.

boiler could therefore account for no more than 42.3% of total heat input for the facility for 2001 (i.e., 2,409,000 mmBtu divided by 5,688,461). Electrical sales attributable to any individual boiler in 2001 could therefore be no greater than 42.3% of 256,311 MWe-hrs, or 108,545 MWe-hrs.

In applying the approach described above for 1991 through 2003, electrical sales attributable to any single boiler at Trigen were never greater than 178,722 MWe-hrs for a single year and 171,237 MWe-hrs on a 3-year rolling average basis.<sup>7</sup> Thus, maximum possible 3-year rolling average electrical sales have historically been over 20% below the 219,000 MWe-hr sales threshold. Using this approach, none of the boilers are subject to the Acid Rain Program, as provided under 40 CFR 72.6(b)(4)(i).

## 2. Steam Output-based Apportionment

Using heat input to apportion electrical facility-wide electrical sales among individual boilers assumes, however, that each boiler produces the same amount of steam per mmBtu consumed. To take account of the possibility that boiler efficiency might vary significantly from boiler to boiler or from one year to the next and that such variances could allow an individual boiler to exceed the electrical sales threshold, U.S. EPA also analyzed Trigen's data using two other approaches – allocating electrical sales based on steam output – to determine if any of the boilers were subject to the Acid Rain Program.

Steam output data was submitted by Trigen to U.S. EPA for 1991-2003. For 1991 through 1999, U.S. EPA calculated steam output for the facility as follows. Total tons per year of coal burned was multiplied by 26 mmBtu per ton to derive total heat input for the facility for each year.<sup>8</sup> The resulting figure was then multiplied by 0.7453 (the lowest rate of kilopounds of steam produced per mmBtu for any individual boiler at Trigen<sup>9</sup>) to arrive at a total annual steam output figure for the facility. For 2000 through 2003, Trigen monitored and reported individual boiler steam output using 40 CFR part 75.

U.S. EPA assumed, for purposes of output-based apportionment of electrical sales, that each boiler was operated for each hour of each year at maximum design heat input capacity of 275 mmBtu per hour,<sup>10</sup> and

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<sup>7</sup> See Attachment A.

<sup>8</sup> See n. 4.

<sup>9</sup> This is the lowest individual-boiler, annual steam output rate for the Trigen boilers during 2000 through 2003, per data submitted under 40 CFR part 75. In 2002, BLR1 burned 1,405,348 mmBtu of coal and produced 1,047,339 klbs of steam, resulting in a rate of 0.7453 klbs of steam per mmBtu. This approach results in a conservative calculated value for total steam output of the facility for 1991-1999, when actual annual output data under part 75 are not available.

<sup>10</sup> See n. 5.

that each boiler therefore produced the maximum amount of steam possible, 1,673,160 klbs<sup>11</sup> for each year. This assumption makes the fraction of total steam that an individual boiler could account for in any given year as large as possible, thereby attributing the maximum possible amount of annual electrical sales to an individual boiler.

The resulting fraction was then multiplied by annual electrical sales for the facility to estimate maximum possible electrical sales for each individual boiler. For instance, in 1993, Trigen had total heat input of 9,322,508 mmBtu, which multiplied by 0.7453 klbs of steam per mmBtu, results in total steam output of 6,948,065 klbs of steam for the facility in 1993. This figure is then divided into 1,673,160 (the maximum amount of steam produced by an individual boiler in any given year), to yield 24.1%, which is the maximum percent of facility steam output that a single boiler could account for in that year. When multiplied by 691,632 (the total MWe-hrs of electricity sold by the facility in 1993), the product is 166,552 MWe-hrs, which is the maximum amount of electrical sales that could be attributed to any individual boiler for that year.

Applying the approach described above, U.S. EPA found that no boiler during 1991 through 2003 had single-year sales of electricity greater than 166,552 MWe-hrs or had 3-year rolling average sales greater than 159,601 MWe-hrs.<sup>12</sup> This maximum possible 3-year rolling average electrical sales is about 25% below the 219,000 MWe-hr sales threshold. Therefore, as with the heat-input-based allocation approach, none of the boilers are subject to the Acid Rain Program under 40 CFR 72.6(b)(4)(i) using this steam-output-based approach.

Finally, as an alternative means of apportioning electrical sales using steam output, U.S. EPA used the same approach as described above, but instead of assuming 0.7453 klbs of steam per mmBtu using data submitted under 40 CFR part 75, U.S. EPA assumed a rate of 0.5201 klbs of steam per mmBtu based on data submitted by TSEC reflecting a different method for measuring steam output.<sup>13</sup> Using this approach, it is theoretically possible that the 3-year rolling average limit of 219,000 MWe-hrs per unit was exceeded in during

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<sup>11</sup> Per manufacturer's specifications, each boiler could produce a maximum of 191,000 klbs of steam per hour. Maximum klbs of steam per hour (191,000) times the number of hours per year (8,760) equals 1,673,160 klbs of steam produced in a year.

<sup>12</sup> See Attachment B.

<sup>13</sup> TSEC measures steam output using a distributed computer system ("DCS") in addition to the part 75 methodology. While U.S. EPA is relying on the part 75 monitoring data, U.S. EPA is taking the conservative approach of considering the DCS data since they indicate lower and more variable boiler efficiency values than the part 75 data. In 2001, DCS-measured steam output for BLR5 was 893,747 klbs, which, when divided by the boiler's heat input for 2001 of 1,718,533 mmBtu, yields a steam output rate of 0.5201 klbs/mmBtu. This was the lowest klbs/mmBtu ratio for all the Trigen boilers for 2000-2003.

1992-1994 and 1993-1995.<sup>14</sup> This approach – like the other approaches discussed above – assumes each boiler was available to produce electricity, and operated at 100% of capacity, during every hour of the year. According to actual operating data from the National Electrical Reliability Council’s (“NERC”) Generating Availability Data System (“GADS”),<sup>15</sup> coal-fired boilers serving generators of 100 MW or less had average availability of 86.3% for years 1992-1994, and 85.8% for years 1993-1995. However, for a Trigen boiler to have exceeded the 219,000 MWe-hr threshold for the 1992-1994 or 1993-1995 3-year periods, the boiler would have needed at least 96.1% or 95.9% availability, respectively, which is significantly greater availability than the average during that period. Therefore, U.S. EPA believes that even considering TSEC’s DSC steam output data, it is highly unlikely that any of these boilers exceeded the 219,000 MWe-hrs electrical sales threshold.

U.S. EPA concludes, based on the above-described analysis, that none of these boilers is currently subject to the Acid Rain Program. If any of the boilers becomes an affected unit, the boiler must comply with all applicable requirements under the Acid Rain Program. This includes the requirements to apply for and receive an Acid Rain Permit (under Part 72), to monitor and report sulfur dioxide, nitrogen oxide, and carbon dioxide emissions and heat input (under Part 75) within the later of 90 unit operating days or 180 calendar days of the loss of the exemption under 40 CFR 72.6(b)(5),<sup>16</sup> and to hold allowances to cover sulfur dioxide emissions (under Parts 72 and 73) starting as of the monitoring and reporting deadline.<sup>17</sup>

This determination relies, and is contingent, on the accuracy and completeness of the representations in the August 15, 2002 letter referenced above and supplemental information provided on October 27 and November 5, 2003, and February 24, 2004 and is appealable under Part 78. The applicable regulations require you to send copies of this letter to each owner or operator of Trigen (40 CFR 72.6(c)(1)). If you have

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<sup>14</sup> See Attachment C.

<sup>15</sup> NERC’s GADS is a database consisting of operating information data for electric generating equipment. This data is compiled annually and reported in the Generating Availability Report (GAR). GAR presents data for five individual years and for a five-year average, with generating unit availability statistics provided on both a capacity weighted and non-weighted basis. For more information, go to the NERC GADS homepage at <http://www.nerc.com/~gads/>.

<sup>16</sup> See 40 CFR 75.4(c).

<sup>17</sup> Any issues concerning the applicability of nitrogen oxides emission limits under the Acid Rain Program will be addressed at that time.

further questions regarding the Acid Rain Program, please contact Robert Miller of EPA's Clean Air Markets Division at (202) 343-9077.

Sincerely,

/s/ (May 13, 2004)

Larry Kertcher for Samuel A. Napolitano, Director  
Clean Air Markets Division

cc: Tom Eller, NY State DEC  
Reggie Parker, NY State DEC  
Steven Riva, U.S. EPA Region 2  
Gerald DeGaetano, U.S. EPA Region 2