



Emission Exceedance Calculation and Reporting

May 4, 2022



Emission Exceedance Calculation and Reporting

3-Hour Rolling Average Based on
1-Hour Blocks

Why 3-Hour Rolling Average Based on 1-Hour Blocks?

- It is one of the most common averaging periods in Permits today
- It is the most difficult to understand averaging period
- We see the most reporting errors with this type of averaging period



Not intended to cover:

- Any averaging period other than 3-hour rolling average based on 1-hour blocks
- Startup/Shutdown Operating Scenarios
- Facilities that have peak and primary emission limits

How should exceedances be calculated?

TM1005 currently reads:

If the emission has a rolling averaging time:
Enter the average emission exceedance for the duration for the incident, in decimal hours.

If one 3-hour block has an exceedance

The exceedance should be calculated as the average of each hour in the three-hour block.

If the exceedance "rolls" for greater than 3 hours

The exceedances should be calculated as the average of each 3-hour block that had been exceeded – i.e. the value is the average of the averages.



For all following examples:

- Permit Language: NO_x: Monitored by continuous emission monitor continuously, based on a 3-hour rolling average based on a 1-hour block average. [N.J.A.C. 7:27-22.16(e)]
- Permit limit 50 ppm (NO_x) and assume all hours are valid hours unless otherwise noted.



Example 1

One 3-hour block out of compliance

Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6
40 ppm	40 ppm	60 ppm	50 ppm	45 ppm	40 ppm
Hours 1-3 in compliance (47 ppm)					
	Hours 2-4 in compliance (50 ppm)				
		Hours 3-5 out of compliance (52 ppm)			
			Hours 4-6 in compliance (45 ppm)		

In this case a three-hour block, hours 3 through 5, would be considered in violation and entered in the EER like this:

1	2	3	4	5	6		7	8	9
Date	Emission	Permit Allowable	units	Averaging Time	Exceedance Start	Time end	Duration	Emission reading	% Deviation
5/16/ 2021	NOX	50	ppm	3 hour rolling	hour 3	hour 5	3.0 hours	52.0 ppm	3.1

The value is the average of the hours in the 3-hour block – i.e. $[(60+50+45)\text{ppm}]/3 = 52.0 \text{ ppm}$

Example 2

One exceedance rolls to 5 hours

Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6
30 ppm	45 ppm	90 ppm	50 ppm	40 ppm	40 ppm
Hours 1-3 out of compliance (55 ppm)					
	Hours 2-4 out of compliance (62 ppm)				
		Hours 3-5 out of compliance (60 ppm)			
			Hours 4-6 in compliance (38 ppm)		

In this case a 5-hour block, hours 1 through hour 5, would be considered in violation and would be entered in the EER like this:

1	2	3	4	5	6		7	8	9
Date	Emission	Permit Allowable	units	Averaging Time	Exceedance Start	Time end	Duration	Emission reading	% Deviation
5/16/ 2021	NOX	50	ppm	3 hour rolling	hour 1	hour 5	5.0 hours	59.0 ppm	18%

The value is the average of the averages – i.e. $[(55+62+60)\text{ppm}]/3 = 59.0 \text{ ppm}$

Example 3

Multiple hours out of compliance

Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9
50 ppm	40 ppm	80 ppm	45 ppm	65 ppm	50 ppm	75 ppm	30 ppm	30 ppm
Hours 1-3 out of compliance (57ppm)								
	Hours 2-4 out of compliance (55 ppm)							
		Hours 3-5 out of compliance (63 ppm)						
			Hours 4-6 out of compliance (55 ppm)					
				Hours 5-7 out of compliance (63 ppm)				
					Hours 6-8 out of compliance (52 ppm)			
						Hours 7-9 in compliance (45 ppm)		

In this case an 8-hour block, hours 1 through 8, would be considered in violation and would be entered in the EER like this:

1	2	3	4	5	6		7	8	9
Date	Emission	Permit Allowable	units	Averaging Time	Exceedance Start	Time end	Duration	Emission reading	% Deviation
5/16/ 2021	NOX	50	ppm	3 hour rolling	hour 1	hour 8	8.0 hours	57.5 ppm	15%

Example 4

Multiple non-consecutive hours out of compliance

Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9
50 ppm	45 ppm	60 ppm	45 ppm	40 ppm	70 ppm	50 ppm	50 ppm	30 ppm
Hours 1-3 out of compliance (52 ppm)								
	Hours 2-4 in compliance (50 ppm)							
		Hours 3-5 in compliance (48 ppm)						
			Hours 4-6 out of compliance (52 ppm)					
				Hours 5-7 out of compliance (53 ppm)				
					Hours 6-8 out of compliance (57 ppm)			
						Hours 7-9 in compliance (40 ppm)		

In this case one 3-hour block, hours 1 through 3, *and* three 3-hour blocks, hours 4 through 8 would be considered in violation and would be entered in the EER like this:

1	2	3	4	5	6		7	8	9
Date	Emission	Permit Allowable	units	Averaging Time	Exceedance Start	Time end	Duration	Emission reading	% Deviation
5/16/2021	NOX	50	ppm	3 hr rolling	hour 1	hour 3	3.0 hours	52.0 ppm	4.0%
5/16/2021	NOx	50	ppm	3 hr rolling	hour 4	Hour 8	5 hours	54.0 ppm	8.0%

Example 5

Invalid data or source downtime

Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9
30 ppm	50 ppm	90 ppm	Invalid hour	Invalid hour	40 ppm	30 ppm	40 ppm	40 ppm
Hours 1-3 out of compliance (57 ppm)								
	Hours 2,3 and 6 out of compliance (60 ppm)							
		Hours 3,6 and 7 out of compliance (53 ppm)						

In this case a 5-hour block, Hours 1,2,3 6 & 7, would be considered out of compliance and would be entered in the EER report as follows:

1	2	3	4	5	6		7	8	9
Date	Emission	Permit Allowable	units	Averaging Time	Exceedance Start	Time end	Duration	Emission reading	% Deviation
5/16/ 2021	NOX	50	ppm	3 hour rolling	hour 1	Hour 7	5.0 hours	56.7 ppm	13.4%



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMPLIANCE & ENFORCEMENT

For Questions

Call your inspector (if known) or contact the Regional Enforcement Office



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Thank you!

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