

# Curtailment Strategy Compliance at Wind Energy Projects

## USFWS Indiana Field Office

Feathering turbines below established wind speeds is a critical conservation measure to reduce bat fatalities at wind turbines. Habitat Conservation Plans (HCP) use curtailment to minimize bat fatalities and Technical Assistance Letters (TAL) use curtailment to reduce bat fatalities such that take of federally listed bats is unlikely.

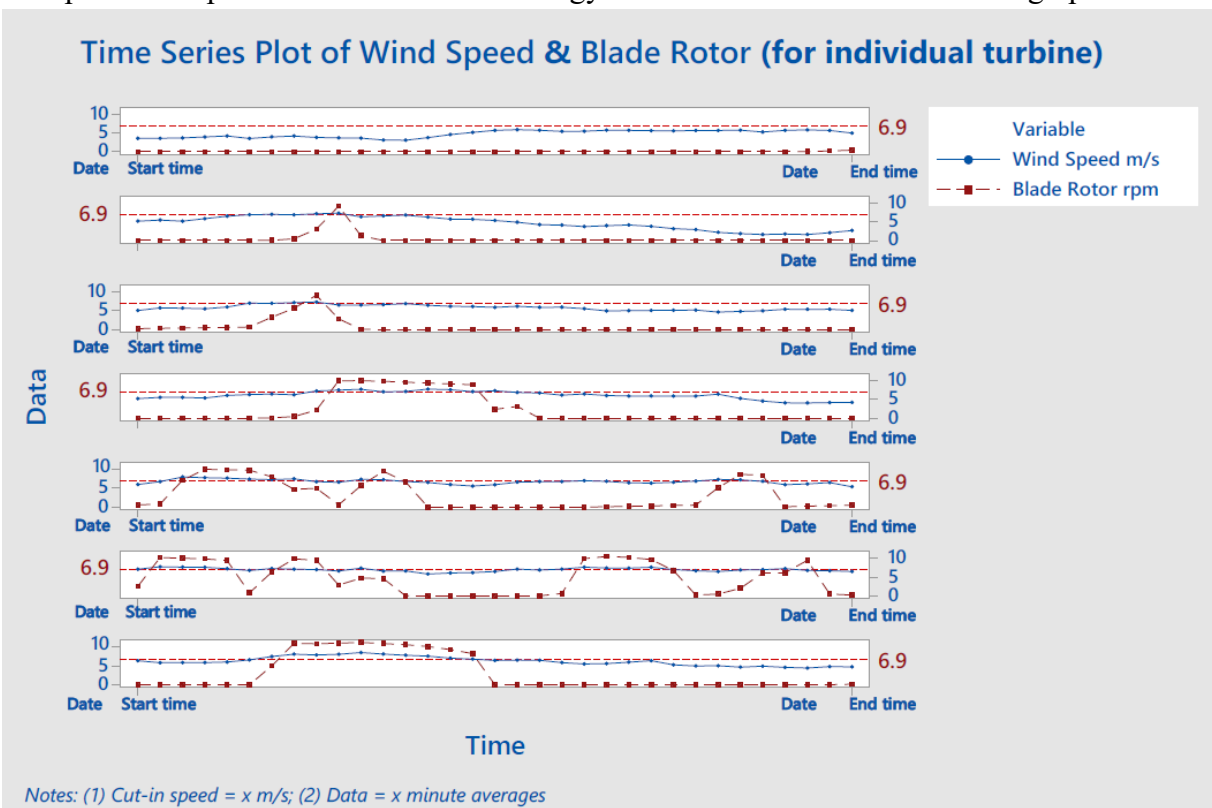
To show that the turbines were operating as expected and according to the curtailment plan, the Service will request data from at least five turbines be provided for between two to four nights during each curtailment season (April 1 – May 15 and/or May 16 – July 31 and/or August 1 – October 15). The Service will randomly select the turbines and dates after the curtailment season.

Data should be provided in either a tabular or a graphical format (see examples below). The precise presentation can be different, but it must be data from the turbines themselves that demonstrates that curtailment is occurring as described in the HCP or TAL. The following information must be provided for each turbine:

- Date
- Time
- Wind speed
- Temperature – if part of the curtailment strategy
- System code – the code used to program and indicate the operational state of the turbine

### Example 1: Graphical Format – preferred

If temperature is part of the curtailment strategy then it should be included in the graph.



## Example 2: Tabular Format

1			WTG 06				
2	Local Time (Eastern Daylight Saving)		ErrorState	Wind Speed	10m Wind Speed	Ambient Temperatu	Curtailment Flag
434	9/27/16 7:11 AM	9/27/16 6:11 AM	FM0	5.96	7.59	9.31	NORMAL OPERATION
435	9/27/16 7:12 AM	9/27/16 6:12 AM	FM0	8.96	7.73	9.29	NORMAL OPERATION
436	9/27/16 7:13 AM	9/27/16 6:13 AM	FM0	8.02	7.72	9.27	NORMAL OPERATION
437	9/27/16 7:14 AM	9/27/16 6:14 AM	FM0	6.84	7.65	9.25	NORMAL OPERATION
438	9/27/16 7:15 AM	9/27/16 6:15 AM	FM0	7.66	7.58	9.22	NORMAL OPERATION
439	9/27/16 7:16 AM	9/27/16 6:16 AM	FM0	7.52	7.57	9.20	NORMAL OPERATION
440	9/27/16 7:17 AM	9/27/16 6:17 AM	FM0	6.37	7.34	9.18	NORMAL OPERATION
441	9/27/16 7:18 AM	9/27/16 6:18 AM	FM0	6.59	7.28	9.16	NORMAL OPERATION
442	9/27/16 7:19 AM	9/27/16 6:19 AM	FM0	7.96	7.39	9.14	NORMAL OPERATION
443	9/27/16 7:20 AM	9/27/16 6:20 AM	FM0	6.51	7.31	9.12	NORMAL OPERATION
444	9/27/16 7:21 AM	9/27/16 6:21 AM	FM0	8.25	7.33	9.10	NORMAL OPERATION
445	9/27/16 7:22 AM	9/27/16 6:22 AM	FM0	6.83	7.41	9.10	NORMAL OPERATION
446	9/27/16 7:23 AM	9/27/16 6:23 AM	FM0	5.78	7.12	9.10	NORMAL OPERATION
447	9/27/16 7:24 AM	9/27/16 6:24 AM	FM757	4.41	6.79	9.10	BAT CURTAILMENT
448	9/27/16 7:25 AM	9/27/16 6:25 AM	FM757	6.08	6.72	9.10	BAT CURTAILMENT
449	9/27/16 7:26 AM	9/27/16 6:26 AM	FM757	8.15	6.77	9.10	BAT CURTAILMENT
450	9/27/16 7:27 AM	9/27/16 6:27 AM	FM757	8.05	6.82	9.10	BAT CURTAILMENT
451	9/27/16 7:28 AM	9/27/16 6:28 AM	FM757	6.21	6.80	9.10	BAT CURTAILMENT
452	9/27/16 7:29 AM	9/27/16 6:29 AM	FM757	7.87	6.92	9.10	BAT CURTAILMENT
453	9/27/16 7:30 AM	9/27/16 6:30 AM	FM757	6.33	6.77	9.10	BAT CURTAILMENT
454	9/27/16 7:31 AM	9/27/16 6:31 AM	FM757	6.52	6.77	9.10	BAT CURTAILMENT
455	9/27/16 7:32 AM	9/27/16 6:32 AM	FM757	6.17	6.58	9.10	BAT CURTAILMENT
456	9/27/16 7:33 AM	9/27/16 6:33 AM	FM757	4.93	6.41	9.10	BAT CURTAILMENT
457	9/27/16 7:34 AM	9/27/16 6:34 AM	FM757	5.49	6.38	9.10	BAT CURTAILMENT
458	9/27/16 7:35 AM	9/27/16 6:35 AM	FM757	6.75	6.60	9.12	BAT CURTAILMENT
459	9/27/16 7:36 AM	9/27/16 6:36 AM	FM757	5.29	6.52	9.14	BAT CURTAILMENT
460	9/27/16 7:37 AM	9/27/16 6:37 AM	FM757	6.46	6.37	9.16	BAT CURTAILMENT
461	9/27/16 7:38 AM	9/27/16 6:38 AM	FM757	5.11	6.10	9.19	BAT CURTAILMENT
462	9/27/16 7:39 AM	9/27/16 6:39 AM	FM757	2.80	5.79	9.21	BAT CURTAILMENT
463	9/27/16 7:40 AM	9/27/16 6:40 AM	FM757	5.29	5.56	9.22	BAT CURTAILMENT
464	9/27/16 7:41 AM	9/27/16 6:41 AM	FM757	5.96	5.52	9.23	BAT CURTAILMENT