
CAPE WIND ASSOCIATES COP REVISION #1

TO: BUREAU OF OCEAN ENERGY MANAGEMENT
FROM: CAPE WIND ASSOCIATES
SUBJECT: CONSTRUCTION AND OPERATION PLAN (COP) REVISION #1
DATE: JULY 25, 2014

Cape Wind submits the following revisions to the approved February 2011 Cape Wind Construction and Operations Plan (COP).

1 – Intra-Array Cable Routes

The February 2011 COP included a location plat that showed the intra-array cable routing. As a result of subsequent engineering evaluation and design, the cable routes have been modified to a small degree. An updated location plat is attached (Attachment 1) and replaces Drawing 1, Sheet 1 of the Location Plat in the COP. In addition, COP section 4.1.4 is updated to list the final total cable length as approximately 70 miles (113 km).

2 – Federal Aviation Administration (FAA) Lighting Plan

The Lease for the Project provides that “In the event that, after the Lease Issuance Date of this lease, the Federal Aviation Administration (FAA) imposes requirements on the Lessee which supersede those in the FAA Determination above, the Lessee shall comply instead with such superseding post-lease requirements.”

The COP is amended to incorporate the Marking and Lighting Changes (“MLCs”) issued by the FAA on May 25, 2014, which make superseding adjustments to the lighting of 10 of the initially installed 101 turbines, until such time as the construction of the full 130 turbines is completed in accordance with the FAA’s prior Determinations of No Hazard. Attached hereto as Attachment 2 is the “FAA Interim Navigational Lighting Plan/Season A” which shows the first 101 turbines to be constructed in Season A and the associated interim navigational lighting thereof as required by the MLCs. The interim marking and lighting changes to the 10 turbines subject to the MLCs are summarized as follows:

2012-WTE-337-OE
<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157247919&row=15> (Interim light added)

2012-WTE-362-OE
<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157249269&row=40> (Interim light added)

2012-WTE-369-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157249693&row=47> (Interim light added)

2012-WTE-371-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157250864&row=49> (Interim light added)

2012-WTE-377-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157251609&row=55> (Interim light added)

2012-WTE-378-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157251673&row=56> (Light removed)

2012-WTE-379-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157251742&row=57> (Interim light added)

2012-WTE-387-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157252646&row=65> (Interim light added)

2012-WTE-413-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157254818&row=91> (Interim light added)

2012-WTE-423-OE

<https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=displayOECASE&oeCaseID=157255477&row=101> (Interim light added)

Since, as anticipated by the Lease, the FAA requirements are expected to change periodically throughout the life of the Project, this COP revision provides that the Project will at all times conform to the FAA requirements that are in effect from time to time, which requirements are incorporated by reference and may be found via the following hyperlink to the website of the FAA:

<https://oeaaa.faa.gov/oeaaa/external/portal.jsp> (search archives) and listed under Aeronautical Study Nos 2012-WTE-322-OE through 2012-WTE-451-OE.

3 – Tekmar Cable Protection System

As originally contemplated in the COP (Section 4.1.3.2), the wind turbine generator (WTG) foundations would have J-tubes for transitioning the cables from the seabed into the foundation termination points. The updated design includes the J-tubes on the ESP, but the external J-tubes are removed from the transition piece on those turbines where water depths allow for cable entry directly into the monopile.

The cable will enter the monopile at a predetermined level above the scour protection and travel through the interior of the monopile up to the transition piece sealed deck hang-off

point for the cables. The area from where the cable exits the seabed and transits through the scour protection to the point at which it enters the monopile or J-tube will utilize the cable protection system (CPS) Tekmar/Teklink®.

Cape Wind plans to preinstall the cable protection system following the installation of the scour protection filter layer and foundation and prior to the installation of the final rock armor scour protection resulting in the cable protection system being positioned between the filter and rock armor layer. The cable installer will then utilize the cable protection system as a conduit to pull the cable through and into the wind turbine foundation (Figure 1). For the ESP, which utilizes J-tubes and a filter layer, the cable protection system will protect the cable as it transitions from the J-tube over the filter layer into the seabed (Figure 2).

4 – ESP Modifications

The Electric Service Platform (ESP) design in the COP (Section 4.1.5) has advanced and installation procedures have been revised accordingly. The configuration of the ESP's fixed template-type jacket frame foundation system (COP section 4.1.5) has been revised from the originally proposed single, large, jacket frame anchored with 6 driven foundation piles to an updated design that requires two smaller, separate, jacket frames, each anchored with 4 driven foundation piles (for a total of 8 piles). The diameter of the piles (approximately 42") will remain unchanged.

The 2011 COP describes the size of the ESP as 100' by 200' in plan. Design at that time called for the 1st deck of the ESP to be approximately 39' above MLLW and rising 49' to the roof. The revised design is nominally 132' by 115' with the first deck approximately 35' above MLLW and rising 47' to the roof.

As the result of continued detailed design, engineering, and contractor input, fewer transformers are required to accommodate the total output of power generated by the Project. Rather than requiring four (4) transformers with a total of 40,000 gallons of transformer cooling oil (as noted on p. 15 of the Oil Spill Response Plan - Appendix A of the COP and elsewhere), the revised design of the ESP specifies only three (3) transformers with a total of approximately 30,000 gals of transformer cooling oil.

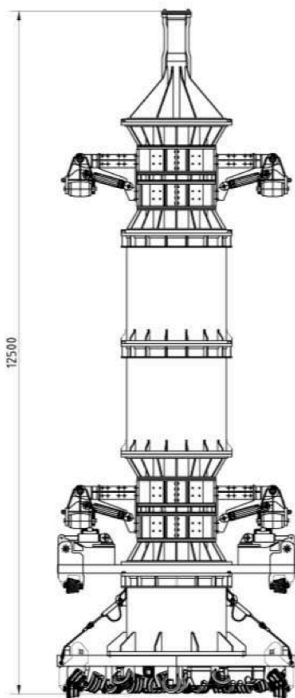
The COP (p. 84) describes the installation of the ESP jackets as follows: "The jacket will be transported to the site on a jack up transport barge. Once on site, the jacket is expected to be lifted from the transport barge by a crane mounted on a separate jack up barge". As described above, the revised design involves two jackets. The plan is to transport them as

described, but install them from a floating rather than jack up barge. The topside installation procedure is a float-over and remains as described in the COP.

5 – Potential Drilling Through Boulders

In addition to the installation plans described in COP section 4.1.3, in the event that a boulder is encountered during the installation of a monopile and the decision is taken to utilize a drill to clear the way for the pile to be advanced, a procedure similar to the following may be used.

A drill similar to the one shown in the sketch (Figure 3) will be lifted over the monopile and lowered to the soil plug present at approximately the seabed elevation.



As the drill is rotated and advanced through the overburden and to the boulder, a reverse circulation (airlift) process will be used to remove the cuttings in a controlled manner through the center drill pipe. The monopile will be kept continually charged with water as compressed air is injected into the center pipe just above the cutting heads. Driven by the water pressure and the rapid expansion of the injected air, an air-water mixture will quickly flow upwards in the drill pipe, pulling the drill cuttings along with the flow. The cross-flow of water from the drill annulus below the full-face bit will carry drill cuttings to the center pipe and subsequently to the surface for disposal by appropriate means.

It may be necessary to deploy under-reaming bits to clear the boulder from below the pile tip, and once the obstruction has been passed, the drill will be retracted and the monopile will be advanced again by a hydraulic or vibratory hammer.

Figure 3

6 – Potential Phased Development

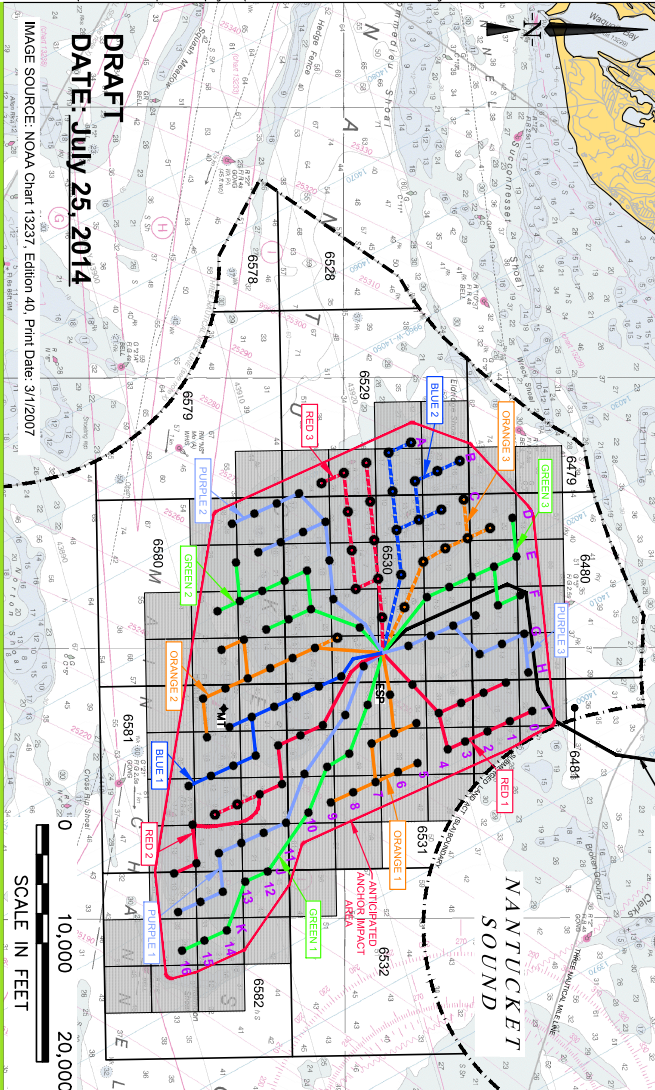
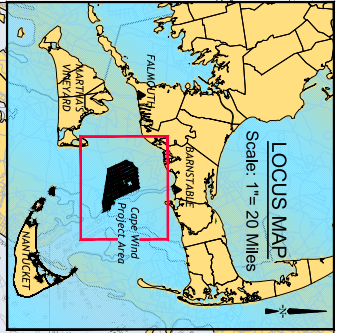
Section 2.3 of the COP is updated to include Cape Wind's plan to implement the Project over multiple seasons in a single mobilization process (*i.e.*, with no expected demobilization process or interim period of inactivity), but with the potential for an interim period between construction seasons. The first season of installation ("Season A") consists of the full infrastructure for the entire 130 WTG project and installation of the first 101 turbines. Cape Wind's schedule is for the installation of the remaining 29

turbines to be implemented in the next following construction season (“Season B”). The Season A and Season B turbines are included in the updated location plat (Attachment 1). Although it would be contrary to the expectation of Cape Wind, there is a potential that an unexpected interim period could occur between the activities of Season A and Season B and, in such case, CWA would pursue the Season B WTG installations in the next following construction season.

Attachment 1

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 FILENAME: H:\E159-50B Cape Wind\Figure\E159_MMS-Leasehold 2014_Alt.dwg

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#	WTG LOC	LATITUDE (dec-deg)	LONGITUDE (dec-deg)	Water Depth (MFL)	WTG	WTG	WTG
1	A4	41.30 55.77289	70.23 48.55710	7.0	F10	41.29 35.58323	70.19 17.62310
2	A5	41.30 37.08711	70.23 37.11240	7.0	F11	41.29 35.58323	70.19 17.62310
3	A6	41.30 18.40514	70.23 26.83975	7.7	F12	41.28 42.50038	70.18 43.97152
4	A7	41.28 59.71601	70.23 14.58952	6.9	F13	41.28 42.50038	70.18 43.97152
5	A8	41.28 41.02310	70.23 03.30305	7.5	F14	41.28 26.81027	70.18 32.61014
6	A9	41.28 22.29144	70.22 46.65310	7.6	F15	41.28 26.81027	70.18 32.61014
7	A10	41.28 03.65340	70.22 46.65310	7.6	F16	41.28 26.81027	70.18 32.61014
8	A11	41.28 44.98457	70.22 28.62366	6.8	F17	41.28 26.81027	70.18 32.61014
9	A12	41.31 36.41158	70.22 18.30108	9.2	F18	41.28 26.81027	70.18 32.61014
10	B1	41.31 17.72258	70.22 06.96500	8.8	F19	41.28 26.81027	70.18 32.61014
11	B2	41.31 17.72258	70.22 06.96500	9.0	F20	41.28 26.81027	70.18 32.61014
12	B3	41.30 40.35446	70.21 46.65310	7.8	F21	41.28 26.81027	70.18 32.61014
13	B4	41.30 21.66924	70.22 42.87661	4.9	F22	41.31 55.92529	70.19 10.26708
14	B5	41.30 02.98152	70.22 42.87661	5.5	F23	41.31 55.92529	70.19 10.26708
15	B6	41.28 44.28494	70.22 20.38970	7.1	F24	41.31 37.23827	70.18 59.10050
16	B7	41.30 02.98152	70.22 31.63176	5.5	F25	41.31 37.23827	70.18 59.10050
17	B8	41.28 26.21444	70.22 09.13410	6.8	F26	41.28 46.64707	70.17 27.92427
18	B9	41.28 46.21444	70.21 46.65310	7.8	F27	41.31 55.92529	70.19 10.26708
19	B10	41.28 26.21444	70.21 46.65310	7.8	F28	41.31 55.92529	70.19 10.26708
20	B12	41.28 26.21444	70.21 46.65310	7.8	F29	41.31 55.92529	70.19 10.26708
21	B12	41.31 30.68924	70.22 44.86759	4.1	F30	41.31 37.23827	70.18 59.10050
22	C1	41.31 30.68924	70.22 44.86759	4.7	F31	41.31 37.23827	70.18 59.10050
23	C2	41.31 02.31840	70.22 22.48232	4.7	F32	41.30 59.84122	70.18 36.89128
24	C3	41.30 59.84122	70.22 22.48232	4.9	F33	41.30 59.84122	70.18 36.89128
25	C4	41.30 59.84122	70.22 22.48232	4.9	F34	41.30 59.84122	70.18 36.89128
26	C5	41.30 59.84122	70.22 22.48232	4.9	F35	41.30 59.84122	70.18 36.89128
27	C6	41.30 06.23778	70.21 48.74330	5.5	F36	41.30 05.75647	70.18 03.05657
28	C7	41.29 47.54856	70.21 37.50450	6.6	F37	41.29 46.31888	70.17 48.21865
29	C8	41.29 28.58411	70.21 26.28411	7.0	F38	41.29 26.38538	70.17 40.33852
30	C9	41.28 10.18530	70.21 15.07364	6.1	F39	41.29 07.68764	70.17 29.28888
31	C10	41.28 51.47415	70.21 05.83916	8.3	F40	41.28 46.91940	70.17 19.73428
32	C11	41.28 51.47415	70.21 05.83916	8.3	F41	41.28 46.91940	70.17 19.73428
33	C12	41.28 14.08866	70.20 41.43697	12.7	F42	41.28 11.56887	70.16 52.40102
34	C13	41.32 20.33868	70.22 44.44562	6.7	F43	41.27 42.81100	70.16 44.66667
35	D1	41.32 01.63460	70.22 13.20332	6.7	F44	41.32 36.55864	70.18 49.87449
36	D2	41.31 42.38422	70.22 01.96262	3.9	F45	41.32 11.66079	70.18 33.84429
37	D3	41.31 24.24869	70.21 50.81312	4.4	F46	41.31 29.76970	70.18 27.45017
38	D4	41.30 47.33255	70.21 21.57283	5.6	F47	41.31 26.00431	70.18 07.26010
39	D5	41.30 28.18056	70.21 17.07951	5.4	F48	41.30 06.68666	70.17 52.38729
40	D7	41.30 09.48338	70.21 05.77444	2.7	F49	41.30 44.31869	70.17 42.00211
41	D8	41.28 50.78931	70.20 54.61910	7.1	F50	41.30 25.66206	70.17 31.98868
42	D9	41.28 52.10172	70.20 43.44433	6.4	F51	41.30 06.94925	70.17 20.71925
43	D10	41.28 54.71642	70.20 21.02831	9.2	F52	41.28 45.41269	70.15 22.45663
44	D11	41.28 36.02388	70.20 09.81438	7.5	F53	41.28 26.70896	70.15 41.31651
45	D12	41.28 36.02388	70.18 58.59788	10.8	F54	41.28 33.40970	70.16 24.93664
46	D13	41.32 28.57913	70.21 41.53312	5.7	F55	41.28 33.40970	70.16 24.93664
47	E0	41.32 28.57913	70.21 41.53312	5.7	F56	41.28 33.40970	70.16 24.93664
48	E1	41.32 04.88891	70.21 30.28389	6.8	F57	41.28 14.78785	70.16 12.92915
49	E2	41.31 37.50510	70.21 07.82312	6.7	F58	41.28 55.41269	70.15 22.45663
50	E3	41.31 08.81831	70.20 56.58227	6.8	F59	41.28 55.41269	70.15 22.45663
51	E4	41.30 50.12878	70.20 45.35752	6.9	F60	41.28 55.41269	70.15 22.45663
52	E5	41.30 50.12878	70.20 45.35752	6.9	F61	41.28 55.41269	70.15 22.45663
53	E6	41.30 31.42808	70.20 34.18840	6.9	F62	41.28 55.41269	70.15 22.45663
54	E7	41.30 12.78982	70.20 22.92791	7.3	F63	41.27 29.30443	70.15 18.98160
55	E8	41.28 54.34560	70.20 01.50763	6.8	F64	41.28 21.93142	70.14 27.42822
56	E9	41.28 54.34560	70.20 01.50763	6.8	F65	41.28 21.93142	70.14 27.42822
57	E10	41.28 16.65847	70.19 49.28580	7.6	F66	41.28 02.51566	70.14 36.11058
58	E11	41.28 67.98801	70.18 38.66474	6.1	F67	41.27 43.81888	70.14 24.93774
59	E12	41.28 39.27223	70.18 28.84624	14.5	F68	41.28 67.28821	70.18 28.84478
60	E13	41.28 20.51067	70.18 15.73175	6.3	F69	41.28 35.58323	70.18 17.62310
61	E14	41.28 20.51067	70.20 04.41765	9.1	F70	41.28 35.58323	70.18 17.62310
62	F1	41.32 06.13878	70.20 47.38323	6.5	F71	41.28 42.50038	70.18 32.61014
63	F2	41.31 49.44478	70.20 46.14910	7.0	F72	41.28 42.50038	70.18 32.61014
64	F3	41.31 30.75606	70.20 24.91804	7.4	F73	41.31 30.75606	70.20 24.91804
65	F4	41.31 12.06771	70.20 13.68744	7.8	F74	41.31 12.06771	70.20 13.68744
66	F5	41.30 52.38818	70.20 02.51723	9.4	F75	41.30 52.38818	70.20 02.51723
67	F6	41.30 52.38818	70.20 02.51723	9.4	F76	41.30 52.38818	70.20 02.51723
68	F7	41.28 67.28821	70.18 28.84478	10.4	F77	41.28 67.28821	70.18 28.84478

Legend:

- 6580 OCS Blocks
- Official Protraction Diagram (OPD)
- Providence NK19-07
- Cape Wind Associates, LLC Lease Area
- Submerged Land Act (SLA) Boundary
- 115KV Submarine Cable
- 33KV Submarine Cable
- Submarine Cable (Multi-colors)
- Submarine Cable (Multi-colors)
- 115KV Submarine Cable
- Season A Wind Turbine (101 WTG)
- Season B Wind Turbine (29 WTG)
- Location Plat

ESS Group
 environmental consulting & engineering services

Cape Wind Associates, LLC
 Cape Wind Project

SCALE IN FEET
 0 10,000 20,000

0 8,000 FEET

DRAFT
DATE: July 25, 2014

IMAGE SOURCE: NOAA Chart 13237, Edition 40, Print Date: 3/1/2007

Figure 1A