



<b>Project Name (1):</b> Barrow Offshore Wind Farm		<b>Country:</b> United Kingdom
<b>Project Location Within Country:</b> Eastern Irish Sea near Barrow-in-Furness south west of Walney Island		<b>Professional Staff Provided:</b>  <b>No. of Staff:</b> 1
<b>Name of Client:</b> DONG Energy A/S		<b>No. of Person-Months:</b>  14
<b>Start Date:</b> 2005-04-01	<b>Completion Date:</b> 2006-06-30	<b>Approx. Value of Services:</b>
<b>Name of Associated Firm:</b> None		<b>No. of Person-Months of Professional Staff Provided by Associated Firms::</b>
<b>Senior Staff Involved and Functions Performed:</b> Offshore Installation Manager		
<b>Detailed Narrative Description of Project &amp; Services:</b>  The Barrow Offshore Wind Farm is equally owned by DONG Energy A/S and Centrica Ltd. The wind farm comprise of 30 Wind Turbine Generators with a total rated power of 90 MW (30 @ 3 MW), 30 WTG Foundations of the Monopile type, 30 Inter Turbine Seacables, 1 Offshore High Voltage Substation (OHVS), 1 Monopile Foundation for the OHVS, 1 Export Seacable, 1 Export Onshore Cable and 1 Onshore High Voltage Substation.		
<b>Technical Data:</b> <ul style="list-style-type: none"> <li>• Start Construction: May 2005</li> <li>• Finish Construction: July 2006</li> <li>• 30 Vestas V90 Wind Turbine Generators generating 3 MW each</li> <li>• Water Depth: 20 m (MSL)</li> <li>• Tidal Range: 9 m</li> <li>• Distance to shore: 8 km</li> <li>• Distance between WTG: 500 m</li> <li>• Surface area: 10 km<sup>2</sup></li> <li>• Annual Power Production: 305 GWh</li> <li>• Soil conditions: Sand and hard Clay</li> <li>• WTG Foundation Types: Monopiles weighing 450 MT and Transition Pieces weighing 115 MT with external J-tubes and no scour protection</li> <li>• Offshore High Voltage Substation (OHVS): Grillage structure (pancake) module weighing 480 MT equipped with one 100 (approx) MVA transformer (33kV/132kV) and other M&amp;E equipment</li> <li>• OHVS Foundation: Monopile with special Transition Piece with four supports and external J-tubes and no scour protection</li> </ul>		



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<ul style="list-style-type: none"><li>• Installation of WTG Foundations: Driving with a hydraulic hammer (1,200 kJ) installation of Transition Piece and grouting. 9 out of 31 Monopiles were drilled due to hard soil (bucket drill from Bauer)</li><li>• Inter Turbine Seacables installed by special ROV using jetting and Export Seacable installed by ploughing</li></ul>	
<b>Services provided:</b> <ol style="list-style-type: none"><li>1. Setting-up of offshore inspection teams for monitoring the offshore installation work: Foundation Installation, Seacable Installation, WTG Installation and Installation of OHVS</li><li>2. Preparation of Quality Control Procedures</li><li>3. Preparation and Management of the Construction Health &amp; Safety Procedures according to CDM Regulations</li><li>4. Chair regular Site meetings with the Installation Contractors</li><li>5. Leading Construction Risk Assessment Forums</li><li>6. Supervision of all offshore installation, hook-up and commissioning activities</li><li>7. Monitor technical quality, non-conformances and progress of offshore related activities</li><li>8. Expedite Site Queries</li><li>9. Coordinate Marine Warranty Surveyor activities related to the offshore installation activities</li><li>10. Claim Management related to Offshore Installation Works</li></ol>	