PIERRE HERAUD

Pertinent Experience:

Team leader of the wind farm design team, Mr. Héraud is responsible for wind farm project development and engineering. Specifically he is involved with wind farm impact assessments, commissioning of meteorological towers, wind resource assessment programs, detailed analysis of wind farm constraints (technical, environmental, social) and optimization of wind farm layouts and other matters, including post-construction noise monitoring. Within GL Garrad Hassan's Project Development group, Mr. Héraud is also involved in the training and guidance of the junior team members in technical matters as well as in project management.

Mr. Héraud obtained a PhD in physics from the Universite de Provence in 2002. He possesses over five years of experience in environmental impact assessments of wind farms in North America. Mr. Héraud set up an ice throw risk, noise impact and shadow flicker assessment team within GL Garrad Hassan North America and has conducted comprehensive ice throw risk assessment on utility-scale wind farms. Since 2005, Mr. Heraud's professional career has been dedicated to wind energy related issues.

Helimax Energy Inc. is now part of GL Garrad Hassan.

Professional Experience:

GL Garrad Hassan, Montréal, Canada
Team leader, Project Development group (2010 – current)
Coordinates and manages the operation of the wind farm design team which consists of eight to ten engineers or scientists who:

- Are responsible for producing deliverables: this includes ensuring that the environmental impact of the wind farm is kept within the regulation limits;
- Optimize wind farm layout with various technical studies contributing to wind farm development;
- Finalize the wind farm feasibility study in conjunction with the Environmental team;
- Manage projects: this includes technical discussions with clients and international subcontractors.

GL, Montreal, Canada
Director of Operations (2009 – 2010)
Coordinated engineering, meteorology, and geographic information system (GIS) teams which consisted of 26 people. This work involved:

- Quality control of the deliverables, energy yield assessments of the wind turbines, ice throw risk assessment, wind farm noise impact studies, and technical studies;
- Management of projects, technical discussions with clients, and coordination with international subcontractors;
- Team technical improvement, training, and human resource management.

Helimax Energy Inc., Montreal, Canada
Practice Leader, Engineering (2008 – 2009)
Participated in the development of the MOE Noise Guidelines for Wind Turbines. Managed projects and headed the wind farm noise assessment team. This included:

- Production of comprehensive energy yield reports;
- Technical discussions with the client;
- Coordinating the engineering team and the subcontractors;
- Editing reports presenting wind turbine testing results for noise, load, and output;
- Remote and on-site problem solving for wind monitoring instrumentation;
- Wind farm layout and micro-siting;
- Wind turbine performance testing, including site calibration and uncertainty analysis.

Helimax Energy Inc., Montreal, Canada
Wind Farm Specialist, Engineering (2005 -2008)
Applied his expertise in fluid mechanics and experimental physics to wind energy engineering. This included:

- Meteorological tower configuration for proper wind resource assessment;
- Wind farm noise calculation, configuration of layout and on-site micro-siting;
- Wind turbine performance testing, including site calibration and uncertainty analysis;
- Turbulence and wake effect modeling;
- Quantitative characterization of terrain complexity;
- Development of computer software.

Project Experience:

Port Alma Wind Farm (2005 -2008)
Pierre Heraud acted as a wind farm specialist for the Port Alma Wind Farm**,** consisting of 44 wind turbines (101.2 MW, Siemens MKII 2.3-MW). His work included:

- Design of the wind farm layout respecting the MOE noise limit;
- Developing the wind resource assessment program;
- Assessment of the energy yield;
- Installation of the met tower to ascertain wind farm performance;
- Project management, data analysis and report production of power curve testing.

Baie-Des-Sables Wind Farm (2005 – 2007)
Pierre Heraud had the role of wind farm specialist for the Baie-Des-Sables wind farm, consisting of 73 wind turbines (109.5 MW, GE 1.5sle 1.5-MW). His work included:

- Noise impact assessment and post construction noise impact measurement;
- Participation in the design of the wind farm layout and the assessment of the energy yield;
- Design and installation of the permanent meteorological masts;
- Project management, data analysis, and production power-curve testing reports.

Massif-Du-Sud Wind Farm (2009 - 2011)
Pierre Heraud acted as a wind farm specialist for the Massif-du-sud Wind Farm in Quebec, Canada which consists of 77 wind turbines (158 MW, RePower MM92). His work included:

- Ice throw risk assessment on ski/snowmobile trail;
- Assessment of environmental impact (Noise, Electromagnetism interference, Visual impact, Shadow flicker);
- Optimization of the layout to minimize noise impact and ice related risk;

Pierre Heraud's Bibliography:

Pierre has authored and co-authored several scientific publications and presentations. These include:

TUSH M., MASSON C. and HÉRAUD P. MODELING OF TURBULENT ATMOSPHERIC FLOW AROUND TUBULAR AND LATTICE MET MASTS. Accepted for publication in the Journal of Solar Energy Engineering.

HÉRAUD P. Poster on Wind Farm Noise presented at AWEA's WINDPOWER 2008 Conference & Exhibition. Houston, 1-4 June 2008.

HÉRAUD P. Poster on Wind Turbine Power Curve Testing presented at AWEA's WINDPOWER 2008 Conference & Exhibition. Houston, 1-4 June 2008.

HÉRAUD, P. and F. PELLETIER. Poster on Wind Farm Noise presented at AWEA's WINDPOWER 2007 Conference & Exhibition. Los Angeles, 3-6 June 2007.

SIBUET-WATTERS, C. and P. HÉRAUD. Poster on Wind Resource Assessment presented at AWEA's WINDPOWER 2007 Conference & Exhibition. Los Angeles, 3-6 June 2007.

HÉRAUD, P. and F. PELLETIER. Poster on Wind Farm Noise presented at CanWEA 2006 Conference and Trade Show. Winnipeg, 22-25 October 2006.

CLANET, C., P. HÉRAUD, and G. SEARBY. "On the Motion of Bubbles in Vertical Tubes of Arbitrary Cross-sections." Journal of Fluid Mechanics vol. 519 (2004), pp. 359-76.