Putting Your Data to Work: Recent experiences in driving marine operational excellence & asset management

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Subrat Nanda is the Chief Data Scientist at the American Bureau of Shipping in Houston and leads data science and advanced analytics efforts. Subrat has over 15 years of experience in applying data science to industrial problems in the areas of asset condition-based maintenance (CBM), prognostics & health management (PHM), reliability engineering, statistical risk assessment and services enhancement. He has successfully developed and deployed applications using machine learning, artificial intelligence & data science technologies in diverse domains such as marine & offshore, gas turbines, wind turbines, financial risk, inspection and marketing. Subrat believes that fusing domain knowledge, data and data science are the key elements for successful industrial analytics. Subrat holds a Master's degree from the University of Exeter, England in Autonomous Systems and a Bachelor's degree in Engineering from University of Nagpur, India. He has filed 14 US patents, 6 trade secrets and has authored more than 25 publications and/or conference presentations in the general area of applied data science for asset health management.

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Abstract

Advancements in the field of data science are presenting new opportunities for marine fleet operators to adopt a more effective asset management strategy that combines advanced data analytics with maintenance and operational experience to achieve a reduction in unplanned downtime and help realize new fleetwide efficiencies. These methods are used to quantify the reliability of maritime assets and drive improved decision making for fleet operations, emergent risk identification, and ultimately improved operational availability and flexibility. This has also enabled operators to move beyond a traditional calendar-based philosophy into condition-based paradigm, where in maintenance efforts and classification are driven by condition of equipment, making them more targeted and optimized for scope and timing. A key part of this is anomaly detection to detect early onset of failure conditions. This further ensures reduction of operating costs, maximum utilization of equipment life and optimization of the total life-cycle. We will describe essentials of condition-based class, methods used to assess equipment health using anomaly detection and additional considerations for deployment. Finally, we will describe recent case studies in these areas as well as challenges in applying them to real world operations.