With energy demands rising and reserves of oil and gas becoming more challenging to access, the productivity revolution promoted by the Industrial Internet is of vital importance to the oil and gas sector. By combining decades of manufacturing expertise with its rapidly expanding software engineering capability, GE is leading the big data revolution so that its customers can operate both more effectively and efficiently.

The Industrial Internet drives improved business outcomes for customers by harvesting the vast quantities of data produced by the GE machines they have installed, such as jet engines and MRI scanners, and feeding this into advanced analytical systems. By analysing the data it is possible to pursue the ‘power of one percent’, a GE term which states that efficiencies of only one percent can make a dramatic impact across the $32.3 trillion of relevant sectors.

In the oil and gas sector, GE is working in partnership with BP to ensure the efficient operation of critical rotating machinery found on the energy company's production facilities. Such equipment includes compressors, generators and critical pumps that are vital to ensure the safe extraction and transportation of oil and gas, around the globe.

By analysing sensor data such as vibration, rotor position, temperature, pressure flow and other parameters, GE is able to identify changes in the operating condition of the machine or determine that the machine is no longer performing at its optimal capacity. Identifying the early onset of abnormal operating conditions minimises disruption and avoids unnecessary periods of down time that often result in lost production or increased costs. For example, BP aims to extend the running period between overhauls without interruption, a substantial challenge due to the aging infrastructure associated with some parts of the industry and the highly challenging environment that it has to operate in.

BP has deployed GE’s System1™ and SmartSignal™ software across a number of its offshore production facilities located in the UK and Norwegian sectors of the

continues over
North Sea, along with other key oil and gas areas such as Gulf of Mexico, Caspian Sea and Angola. Utilising their investment in offshore network connectivity, BP is able to remotely monitor its machinery from its Advanced Collaborative Environment (ACE) centre in Aberdeen and take advantage of expert support from any of GE’s dedicated remote monitoring centres around the world. Remote monitoring has a number of benefits for customers, not least because it removes the need to bring extra staff on to the rig to undertake physical monitoring in an environment which can be plagued by hostile weather conditions. It also means that experts can be consulted remotely from anywhere around the world, as required.

GE assists BP to harvest and manage large volumes of data from sensors installed on its offshore machines with the ability to vary the amount of data being captured based on operating status and when a potential problem is identified so that an accurate diagnosis can be made and pre-emptive interventions taken. BP’s objective is to eliminate defects in operations, and this solution ultimately allows BP to take a more proactive approach to maintenance, whilst having additional insights to manage risk.

The extraction of oil is a highly complex process and is made more difficult by the fact that the oil is often mixed with pockets of hydrocarbon gas. Moreover, with exploration targeting new frontiers in ever more demanding and challenging locations with increasing water depths, companies such as BP are looking to deploy advanced technologies to enable access to these reserves.

As Gillian Goby, Performance Enhancements Team Leader of BP notes:

“The oil and gas industry is an extremely dynamic sector that places great demands on its personnel and equipment. Any solution that helps to ensure the integrity of our assets whilst minimising production disruptions, offers significant benefits for our operations. BP highly values condition monitoring because it helps us manage our machines more effectively by allowing us to identify developing abnormal conditions and plan our maintenance activities”

The synthesis of big data and engineering excellence forms the backbone of GE’s offering in the oil and gas sector. As customers like BP understand, the sector presents many challenges, but with the advent of big data and the Industrial Internet there is much scope to eliminate variability of performance and increase up-time in oil and gas exploration and extraction.

The harnessing of oil helped drive the Industrial Revolution, and now such transformative power is being driven by the next technological revolution, the Industrial Internet.

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