



### **Part 1: A Hidden Similarity**

Beyond the normalcy and near routineness of our daily lives, we almost do not notice the separate world that powers our existence. We rise in the morning in heated homes, run hot water to have our morning shower, turn on the kettle to boil some water to make a cup of tea or coffee. We turn on the telly to catch the morning news while having toast, and then we are out of the house to work, or school, or wherever we go daily. Most of us will take a car, a bus, a train or even fly on an airplane to that destination. We do this daily in near routineness without fail in what we consider as normal, oblivious to the mechanisms that make it possible.

What powers the boiler that delivers the heating that makes the house comfortable to sleep in, and provides the hot water for that morning shower? What powers the kettle or tv? Electricity I hear you say. What about the coffee or bread for the toast? How did they get to you? They may have come from hundreds or thousands of miles away. Some form of land, air or sea transport maybe? Same way we may have gotten to work. There is a world that powers

our world, that delivers the electricity that makes our lives convenient, that provides the food we eat and moves us around almost seamlessly with only the interruption of the limitation of human efficiency. This world is a world of machines, an army of them, maybe even as many as the human population itself.

In November 2019, I had the rare opportunity to make a return journey with the engineering crew and crew aboard a Caledonian MacBryane ferry, from Androssan to Brodick on the isle of Arran. This regular roundtrip between Androssan to Brodick is critical to transporting people and cargo from the mainland to the isle of Arran and back. In fact, it is the main means for the delivery of any household supplies to Brodick. So, engineers and crew work ceaselessly round the clock to ensure that the vessels keep running. These vessels are driven by thirty odd pieces of heavy machinery from diesel engines and generators, to pumps, thrusters, compressors etc. that ensure the ferry is able to function and transport people and cargo safely from one point to another. On my voyage, I asked the engineers and crew what the implication of a breakdown of the vessel might mean, the answer was unambiguous. Almost all the engineers and crew said an interruption to the service along this route can result in shortage of food and household essentials to the small village of Brodick and can potentially end up in the local evening news for all the wrong reasons. Talk about on the job pressure.

It is almost inevitable that many of the thirty odd pieces of heavy equipment on each shipping vessel will fail and breakdown at some point in their working life. So, the challenge for engineers is to maintain this equipment to prevent failure or increase their time to failure and monitor the equipment to identify when they will fail. Herein lies some similarities between man and machines. As we live our lives on a day-to-day basis, it is almost inevitable we will encounter some form of health issue at some point in our lifetime. The challenge for us is to maintain our health to prevent us from falling ill or defer illness and constantly monitor our health. We try to prevent ourselves from falling ill through regular exercise, eating healthy and avoiding exposure to sources of illness, like bugs etc. We monitor our health with all the latest test kits and diagnostic tools, a fit bit, heart rate monitor, blood sugar testing kit etc. This similarity is also striking with machines; the maintenance of machines to ensure continued normal operation like topping of essential fluids, avoidance of machine contamination by replacement of worn out parts and the use of sensors to monitor deviation from normal operation, e.g. monitoring elevated temperatures, through thermography (temperature monitoring), vibration analysis and oil condition monitoring.

The convenience we experience in our daily lives is supported by machines and these machines share many similarities to us. In a 3-part series, I will take readers on a journey that covers why it is important for engineers to look after the machines that support human existence and the techniques available to do these.

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