Overview

John Crane provides customers with mechanical seals used in various industrial applications. A monitoring system relying on hard-wired connections is used to alert the customer to seal failures. Because of the harsh environments these seals typically operate in, the multitude of wires that this system requires is not ideal. Our team was tasked with designing a wireless monitoring system to replace the system currently being used.

Objectives

- Provide a proof of concept and design for a wireless mechanical seal monitoring system capable of indicating failure.
- Provide John Crane with research to expand on the project and eventually implement the design into mechanical seals.

Approach

- The team worked in conjunction with John Crane to establish project requirements.
- A block diagram was created to identify the subsystems necessary to achieve the desired outcome: analog to digital conversion, signal processing, wireless transmission.
- Several designs were considered until the team decided on the optimal system design.
- The team frequently communicated with the sponsor to give progress updates and receive feedback throughout the semester.

Outcomes

- John Crane was provided with a proof of concept indicating that a wireless seal monitoring system which meets all of the initial project requirements is feasible.
- Recommendations were made to guide the sponsor in optimizing performance and developing a working prototype.