Project Scope

Danfoss expanded its business several years ago to include the refurbishment of its compressors. These compressors have been in field service for many years. Such a service requires diligent management of hardware throughout the process. There can be no integration of new compressors and refurbished parts. Therefore, a separate logistics and product flow had to be created that was distinct to those compressors coming back from the field. The system evolved into a series of subsystems. Each subsystem is functional on its own, however, it requires technician diligence to keep the records organized. Danfoss wishes to integrate the various subsystems and develop a system that is far more user friendly, automated, and robust. This integrated system is to generate a bill of materials for a given aftermarket compressor using records provided by Danfoss's aftermarket investigation team.

Project Description

` *The objective of this project is to design a system that coordinates existing record keeping subsystems to organize aftermarket production, preventing aftermarket parts from entering into new production. The system is automated and more effective than current subsystems.*

Key Goals

There are a few key goals surrounding the DTC Aftermarket Workflow and Process Creation and Implementation Project. The system is easy to use as it will be handled by technicians and operators who have little to no prior knowledge as to which parts need replacement in aftermarket compressors. The system is to organize a list of parts that need to be fixed for any given aftermarket compressor and print out a bill of materials for

refurbishment. The display is aesthetically pleasing with a favorable graphic user interface. The system is capable of handling TT/TG compressors and accommodates for backwards compatibility. Danfoss will then be capable of duplicating the system for various models of compressors. The system accounts for human error by automating Danfoss's subsystems ensuring the right parts are replaced. The system also does not allow duplicate items or items to be listed on the report that do not need to be replaced. . This system will be tested and validated using fictitious compressors. Once the process has been validated, it will be tested on the aftermarket production line. Danfoss hopes to implement this system by the end of spring in 2021.

Primary Market

The primary market for the project is aftermarket compressor manufacturers. More specifically, compressor manufacturers that have organization issues within their aftermarket production line.

Secondary Markets

Another potential market for the product is recalls in the auto-manufacturing industry. The product can assist in determining replacements for mandatory callbacks. The system could also be used in inventory management to automate the record keeping process eliminating human error. The product could be used in supply chains and logistic firms by using existing data to culminate solutions decreasing the time it takes to make accurate decisions. Finally, the solution could be implemented in laboratories to increase organization of incoming data and assist with post-processing.

Assumptions

For this project, there are few necessary assumptions to be made. First, the product is functional on a PC platform, The technician is capable of operating the digital interface. The product will be used at Danfoss in their aftermarket manufacturing facility. The operator will be inputting valid data. Another assumption is the compressors are not being redesigned. The results from the solution are based on the data provided by Danfoss. The system does not simulate or test the conditions of failure in the compressor, but gives feedback based on the compressor failure reports which have been provided by Danfoss's testing facility. Finally, the system excludes the processes which occur prior to testing and after production.

Stakeholders

Stakeholders are those who will use, benefit, are interested, or have a concern about this project. The primary users of the system will be operators and technicians at Danfoss Turbocor. The primary benefactors are the customers that receive the refurbished compressor from Danfoss.

Other users of this system comprise those listed in the secondary markets section mentioned above. They include but are not limited to companies that have compressors as one of their assets and plan on using Danfoss's aftermarket compressor repair services.

Businesses like Ryder and EY, logistics and supply chain companies, will benefit from the system. These are potential stakeholders in this product.

Our point of contact Stephen Seymore, the operations engineering director, as well as other members of Danfoss's upper management benefit from a faster aftermarket repair program and positive image produced by satisfied customers.

Our professor and advisor for this project is Dr. Shayne McConomy. Other interested faculty include Dr. Mohd Ali, the project's faculty advisor. Finally, the FAMU/FSU College of Engineering supports the project.