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Team 507: High Speed Shaft Assembly

System – Project Charter

Elijah Beard, Joshua Boyd, Hui Xu

FAMU-FSU College of Engineering 2525 Pottsdamer St. Tallahassee, FL. 32310

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Project Scope

Design and fabricate fixtures and methodology to yield repeatable high-speed shaft assemblies which consists of several critical sub-assemblies.

Project Description

Danfoss Turbocor® has contracted our team to design an assembly process to press pre-heated sleeves onto shafts for compressors manufactured at the Danfoss Turbocor® facility. The sleeves and shaft are of set sizes and materials. Our team will analyze the required forces and alignment needed to press the sleeves onto the shafts, and we will look at how to create an assembly to do this process quickly and with no waste.

Key Goals

The assembly will be designed to handle the specific sleeves and shafts used by Danfoss Turbocor®. The process will be a green process (i.e. no waste or gaseous emissions), and will operate at a high frequency so many shafts can be assembled in a short period of time.

Market

The market for this assembly will be Danfoss Turbocor®, however our general assembly process has the potential to be used across the manufacturing industry.

Assumptions

We will not need to assemble shafts of varying sizes, so the process may be optimized for a specific structure. The sleeves will be preheated to a consistent temperature, so the assembly process will be repeatable for each shaft.

Stakeholders

Danfoss Turbocor® is the primary stakeholder for this project. Other stakeholders include our team's adviser, Dr. Hollis, and our Senior Design instructor, Dr. McConomy. The FAMU-FSU College of Engineering is also a stakeholder, as our team's performance reflects upon the institution.

Code of Conduct

Mission Statement

Our team is devoted to engendering a strong sense of professionalism, cooperation, and understanding between each other and Danfoss Turbocor®. Our goal is to exceed our client's expectations and form a bond with our client and advisers that is informed by trust and commitment to our project.

Team Member Roles

All teammates have self-selected and agreed to the roles outlined below. Due to the small number of individuals in our group, additional duties not specifically outlined in the roles listed below will be delegated based on the following, in order of importance:

- 1) The desire of a specific member of the team to perform the task in question.
- 2) Relevance of the required task to a team member's role.
- 3) Current workload of the team member whose role is most appropriate for the additional task.

Team Leader - Elijah Beard

- Communicates between the team and our professor, sponsor, and adviser
- Records meeting minutes
- Provides supplemental aid to other team members with CAD, analysis, and research

CAD Software / Analysis Lead - Joshua Boyd

- Use CAD software to model and design elements of the Shaft Assembly.

- Determine ways to obtain measurements pertaining to our project goal.
- Perform force and collision analysis with relevant software to analyze our designs

Budgeting / Purchasing Research Lead - Hui Xu

- Conduct research on materials that will be needed throughout the project.
- Research similar projects or past year Danfoss projects to compare costs.
- Discuss with group members budget priorities
- Make final decision on purchasing materials.

These roles are summarized in the table below.

SD Team 507 – Team Member Roles	
Team Leader	Elijah Beard
CAD / Analysis Lead	Joshua Boyd
Purchasing / Research Lead	Hui Xu

Communication

The main form of communication within our team will be via smartphone using the application “WeChat”. Our team will use email to communicate to our sponsor and advisors to set up meetings and ask questions. Team Members will be responsible for checking and responding to emails and messages regularly to ensure that everyone is participating and informed on the project. All team members commit to responding to correspondence within 24 hours of the message being issued. File sharing will be done using Google Docs, and every team

member will have access to all files pertaining to our project. Meeting minutes will be tracked and uploaded to a Google Doc.

When communicating within our team or to our sponsor and advisor each member is expected to be appropriate and respectful. Our team will have an understanding that not everyone is equally skilled in communicating efficiently and will make accommodations to ensure everyone is equally informed on our project.

Decision Making

Given that there are only three team members, most decisions will be arrived at by being agreed upon by at least two out of three team members. This oral voting process will happen after a thorough, collaborative discussion of the subject at hand. This process will include brainstorming, research, and analysis as these tasks pertain to each member's individual role outlined in the "Team Member Roles" section of this document.

Dress Code

All team members agree to the dress code outlined below as it applies to the following circumstances.

General Team Meetings

For general team meetings, which include both impromptu meetings and scheduled weekly meetings outlined in the Attendance Policy, no particular dress code will be enforced. Casual attire like what one would wear to class or on one's own free time is acceptable.

Adviser / Sponsor Meetings

For all meetings our team has with our sponsor or adviser, business casual attire is preferred in order to convey a reasonable level of professionalism to our client and adviser. Dress shirts, Polo shirts, long pants, professional skirts, and blouses are all examples of business casual attire, but qualifying attire is not limited to these examples. Any closed-toed shoes are acceptable footwear for business casual attire, as defined by our team.

We understand that extenuating circumstances are always a possibility and we are willing to work with any team member having trouble meeting the dress code policy to come to a solution.

In the event of repeated dress code violations by a team member, a warning will be given to said member by the other teammates. If dress code violations continue after that, the team will inform Dr. McConomy of the issue and we will account for said dress code violations in our final team member evaluations.

Presentations

Professional attire must be worn for any presentations, regardless of the audience, be it students or sponsors. This is to help convey the strong level of professionalism we apply to all of our work on this project. Examples of professional attire include a dress shirt with dress shoes and dress pants, a suit, a professional blouse and skirt, or other professional, qualifying attire.

Attendance Policy

Team members are expected to participate in all meetings and to arrive on time, and attendance will be recorded in the meeting minutes. If there are any emergencies involving a team member that may inhibit said member from attending a meeting, the team member should inform the other team members as soon as possible so that the team may make appropriate

accommodations. Repeated absences without a valid excuse will not be tolerated. If a team member is repeatedly absent without notifying the other members the absences will be recorded and sent to Dr. McConomy. This may impact the student's course grade and will negatively influence his or her peer evaluation score at the end of the academic year. Our team will meet at least three times weekly, as outlined in the table below, and will tentatively meet with Dr. Hollis, the team's adviser, every two to three weeks. Our team will meet our sponsor by appointment weekly throughout the academic year.

Weekly Team Meeting Schedule		
Tuesday	Thursday	Friday
3:30pm - 4:30pm	3:30pm - 4:30pm	2:00pm - 3:00pm

Conflict Resolution

All collaborative ventures can be prone to occasional conflicts between persons within the group. These may be personal or professional in origin, and care should be taken in addressing these sensitive issues. All team members are encouraged to be open and honest with the team, and to feel free to communicate any concerns they have to the team leader or the team as a whole. Once said grievances are made known, the team will agree to allocate a portion of a meeting outlined in the Weekly Meeting Schedule to discuss the issues as a group and come to an amicable decision that satisfies all parties involved. If an amicable decision cannot be reached, the course instructor or relevant administrators may be informed of the situation to help resolve the conflict or decide upon the next appropriate course of action.

Statement of Understanding

All team members hereby acknowledge that they agree to the code of conduct outlined in this document by signing below.

Printed Name	Signature	Date
<u>Elijah Beard</u>	<u></u>	<u>07/18/18</u>
<u>Joshua Boyd</u>	<u></u>	<u>09/18/18</u>
<u>HUI XU</u>	<u>Hui Xu</u>	<u>09/18/18</u>