UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description

Company Name	**GE Aviation**	**Date Submitted**	June 15, 2017
Project Title	**Automating CFM 56 Part Transfer (GE_CFM56)**	**Planned Semester**	Fall 2017

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person. Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	3	Electrical	3
Computer		Systems	
Other ( )			

Project Overview:

Provide a system design to complete the automation of the CFM forward shaft production by adding a method for automatically moving the completely machined part from the end of machining conveyor to the Coordinate Measuring Machine (CMM).


CFM-56 Engine

Initial Project Requirements:

The CFM 56 Engine forward shaft is manufactured on an automated line, where a GE Fanuc robot moves the parts between CNC machines. After machining, the parts are automatically positioned to an end of conveyor four part queue awaiting cleaning and then measurement on a CMM to

verify conformance to print. Removal of a part from the queue is sensed and the conveyor indexes to create an open space in the queue for the next machined part. Parts are today moved manually from the queue, cleaned in a wash station, and then placed on the CMM.

The scope of this project is to design a method for removing the parts from the queue, one at a time, cleaned, and placed on the CMM, and potentially start the CMM program, all automatically.

The method of part movement must work automatically to sense the part, move it into position into a rinse/dry operation, remove the part when washing is complete, move the part to the CMM, placed in correct position to begin CMM routine, and remove the part to a pallet once measurement routine is complete.

The method of part movement must be integrated into the part movement system for the existing production line.

Note: At no point during this method of part movement process can the hardware material, geometry or surface finish be negatively impacted (E.G. No brass in contact with part material)

Expected Deliverables/Results:

Deliverables to include a complete design package to allow for bidding and contract award to an integration vendor to complete a turn key fabrication and installation.

Disposition of Deliverables at the End of the Project:

No hardware to be developed on this project.

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):

- *Robotic logic programming skills*
- *US Citizens or Green Card holders*
- Travel to GE site in Wilmington NC will be required and travel expenses will be re-imbursed from Project budget.