INDUSTRIAL SOLUTIONS LABORATORY

Company Information

Company Name	*3M Scott Fire & Safety* *Part of 3M Personal Safety Division*	**Date Submitted**	*05/1/2023*
Project Title	*Design of a REGULATOR Test System for Red and Green Rabbits (Go/ No-Go Verification Test Parts) (**3M_REGULATOR**)*	**Planned Starting Semester**	*Fall 2023*

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1
Computer	1	Systems	

Company and Project Overview:

3M|Scott Fire and Safety is a premier manufacturer of innovative respiratory and personal protective equipment and safety devices for firefighters, industrial workers, police squads, militaries, homeland security forces and rescue teams around the world. 3M|Scott products protect thousands of individuals each day from environmental hazards including smoke, toxic fumes, combustible gases, falling objects and contaminants. The 3M|Scott product line includes self-contained breathing apparatus' (SCBA), supplied air and air-purifying respirators, thermal imaging cameras and firefighter communication and accountability devices.

Headquartered in Monroe, North Carolina with corporate offices in St. Paul, Minnesota, 3M|Scott Fire and Safety generates >$500M in revenue and employs about 500 people in Monroe.

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3M™ Scott™ Air-Pak™ X3 Pro SCBA with 3M™ Scott™ E-Z Flo C5 Regulator - Front

Project Requirements:

The UNC Charlotte Team is requested to develop red and green "rabbits" for the 3M Scott Fire & Safety Regulator test systems. These Go (green)/ No-Go (red) reference parts will assist in the verification of testers for the various Regulator assemblies. The green parts will be within the testing parameters, and the red parts will be slightly outside the parameters to determine the validity of the testers. The rabbits will be used daily in conjunction with production operations.

Expected Deliverables/Results:

- Work with the lead, calibration lead, and engineers to verify the test systems and priority level
- Work with lead and engineers to verify which systems are pass/fail or produce quantifiable outputs
- Observe and try each testing system to understand the test and outputs

- Develop a green (Go) and red (No-Go) rabbit for each system
- Each rabbit must conform to test and product specifications
- Develop a verification procedure to ensure the quality of each tester using the Go/ No-Go gaging
    - Start of shift, after breaks, at end of shift, etc.
    - Develop run charts on each rabbit to determine if a new rabbit or test system upgrade is needed
- Rabbits must be easy and efficient for Team Leads and Operators to use with little disruption to production operations
- Build each rabbit based by priority level
- Test and verify each rabbit once built
- Work with Lead and Quality Engineers to run capability studies for the repeatability of the rabbits

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

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

- Travel to the 3M facility in Monroe, NC