UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE of ENGINEERING

UNC Charlotte – Lee College of Engineering Senior Design Program

Senior Design Project Description

Company Name	*AO Smith*	**Date Submitted**	*06/19/2019*
Project Title	*In-Process Leak Detector System* **AOS_LEAK**	**Planned Starting Semester**	*Fall 2019*

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	3	Electrical	1
Computer	1	Systems	
Other ( )			

Company and Project Overview:

For millions of consumers, business owners, property managers and engineers worldwide, A. O. Smith has delivered innovative hot water solutions for over 80 years.

A. O. Smith's selection of residential and commercial water heaters, boilers, and storage tanks is unmatched for quality and diversity. Anywhere hot water is needed, A. O. Smith can provide an energy-efficient solution with maximum value during and for years after installation. And, A. O. Smith stands behind its products and its customers with world-class service, combining cutting-edge technology with committed people who take pride in being the very best.


A. O. Smith produced its first residential water heater in 1939, establishing a tradition of innovation that continues to this day. In 1953, A. O. Smith shipped its first commercial water heater equipped with a "glass-lined" tank, which remains the industry standard for protecting steel from the corrosive effects of water.

A. O. Smith Water Products Company is headquartered in Ashland City, Tennessee, home of the world's largest water heater factory. The A. O. Smith network includes five manufacturing facilities in North America including McBee South Carolina, plus plants in Nanjing, China and Veldhoven, The Netherlands.

This project will be associated with the McBee, South Carolina water heater assembly operation.

Project Requirements:

AO Smith water heaters are well known for their reliability and quality of production. AO Smith is always looking for ways to innovate to improve quality. During the fabrication operation, the water tank is built to be leak proof. Tanks are designed and built with threaded fittings for accessory items such as a pressure relief valve or a drain valve. These accessory items are installed as a tank unit proceeds down an assembly line. Once all of the accessory fittings are installed, the unit leaves the assembly line and proceeds to be packed and shipped.

While very rare, it is possible that an accessory could be installed incorrectly and cause a leak at that fitting location. The objective of this project will be to examine the current assembly line operation and design a system that can interface to this assembly line and perform an automated operation that would ensure no leaks can occur at each of the fitting locations.

Expected Deliverables/Results:

- Proof of concept system that validates for each fitting on a tank,, that leaks are not possible or if they are possible, they are detected and flagged.
- System must "add-on" to the current assembly operation without requiring significant changes to the current assembly line equipment
- System should operate at the current pace of the assembly line so that production efficiency is not affected.

Disposition of Deliverables at the End of the Project:

Hardware developed is the property of the Industry Supporter. The work product will be displayed at the last Expo then immediately handed over to the supporter unless arrangements have been made to deliver at a future date.

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

- Ability to travel to McBee SC to gather data for the design and perform verification test.