



## **Mechanical Engineering**

**TENNESSEE TECH**

### **Memorandum**

**To:** Christy Killman, President of the TTU Faculty Senate

**From:** Corinne Darvennes, Professor, Department of Mechanical Engineering  
Ahmed ElSawy, Chairman, Department of Manufacturing and Engineering Technology  
Stephen Idem, Professor, Department of Mechanical Engineering  
Jane Liu, Professor, Department of Civil and Environmental Engineering  
Joseph Ojo, Professor, Department of Electrical Engineering  
Holly Stretz, Professor, Department of Chemical Engineering

**Date:** February 5, 2018

**Re:** Fitzgerald Glider Study

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Per [1], gliders ‘are medium and heavy duty trucks that are assembled by combining certain new truck parts (that together constitute a ‘glider kit’) with the refurbished powertrain – the engine, the transmission, and typically the rear axle – of an older truck’. In July 2016, Tennessee Tech University agreed to participate in a project sponsored by Fitzgerald Glider Kits. As provided in the Proposal Endorsement Form recently provided to the College of Engineering, Objective 1 of the study was to “Compare Glider Kit compliance with existing and proposed EPA regulation challenges. Establish a matrix of remanufactured components and emissions of comparable engine choices”. Dr. Ben Mohr, the Chair of the Department of Civil and Environmental Engineering, and Mr. Mark Davis, Academic Support Associate, were listed on the proposal as the grant personnel. Dr. Mohr was asked to be the PI on the project, since the testing was going to be done by Mark Davis, and they needed a faculty member from CEE to serve as the Principal Investigator. Mr. Tom Brewer was not listed as Principal Investigator or Senior Personnel. He is the Associate Vice President for Research, and Director of the Center for Intelligent Mobility, in the Office of Research. The proposal was approved by Dr. Bharat Soni, the Vice President for Research & Economic Development. Therein several salient facts relevant to this study are presented:

1. Mr. Tom Brewer and Dr. Bharat Soni were hired by President Oldham without the benefit of a formal search being conducted, and with little or no input from the faculty or other administrators in TTU. Mr. Brewer has a B.S. degree in Business Administration. Dr. Soni has a Ph.D. in Applied Mathematics, and an M.S. degree in statistics and operation research, and a B.S. degree in statistics. In August, 2017, the creation of the Center for Intelligent Mobility was announced [2]. The center was created without seeking advice from the TTU faculty or other administrators. The center is housed in the Office of Research, and does not coordinate any of its activities with other research centers in the College of Engineering. The Director of the center does not have formal degrees in any engineering discipline.
2. On June 15, 2017 a letter (which constitutes the only publically available report of the test results from the Fitzgerald project) was submitted to Congressman Diane Black [1]. The letter was signed by Dr. Philip Oldham, President of Tennessee Tech University, and Mr. Brewer, respectively. In this letter, it was claimed that TTU tested “thirteen heavy-duty trucks on a common chassis dynamometer at a common site; eight trucks were remanufactured engines and five were OEM ‘certified’ engines, all with low mileage.” The TTU summary report was subsequently featured in a petition from Fitzgerald Gliders Kits, LLC, to Mr. Scott Pruitt, Administrator, Environmental Protection Agency, requesting that Phase 2 Final Rules, governing allowable levels of emissions from medium- and heavy-duty engines, not be applied to glider kits [1]. As noted in [3], that statement represents “all that is said by TTU to describe its testing. The report presents (1) no details on the specifics of the test vehicles (e.g. model year, mileage, and condition); (2) no information on test cycles, test conditions, test loads, and test fuels; (3) no information on the testing facilities (e.g. test equipment, calibration and maintenance practices, and quality assurance procedures); (4) no information on emission test protocols; and (5) no meaningful data on the pollutants of interest, such as NO<sub>x</sub> and PM.” As indicated in [3], “TTU’s letter indicated that the PM levels were ‘below the threshold detection limit’ and, consequently, no test data were presented. TTU did not measure PM levels.
3. In a follow-up conversation with EPA staff [4], “TTU stated that no particulate matter samples were collected during testing. The sampling probe filter used with the Enerac M500 was visibly inspected for particulate matter. Particulate quantification was subjective in that it was visual only. TTU stated they performed a smoke test but did not elaborate.”
4. The cursory report issued to EPA by Dr. Oldham and Mr. Tom Brewer did not measure or report such quantities as NO<sub>x</sub> and Particulate Matter (PM) concentrations. However, the letter from President Oldham to Congresswoman Black clearly indicated that all engines that were tested met or exceeded the current limits on these emissions. These tests were performed without the participation of qualified TTU researchers, and despite the flawed nature of the testing, selective results were therein conveyed to EPA. However, a fully-qualified expert in the area of diesel engine testing and emission control was available in the College of

Engineering beginning Aug. 1, 2016, shortly after the start of the Fitzgerald Project Phase I. Despite the faculty member's extensive expertise and experience in this area, the faculty member was never asked to participate in the Fitzgerald project, either directly or indirectly. The faculty member was never asked to review any test data, reports, test conclusions, or the letter sent to EPA by Dr. Oldham and Mr. Tom Brewer to provide independent review of the results and conclusions.

5. Although Dr. Mohr was originally listed as the PI on the first phase of the Fitzgerald Glider project, he has stated that he did not actually do any of the testing, and his requests to visit the test site at Fitzgerald were never arranged. Tom Brewer ran the project as a "shadow PI", and did not even show the final report to Dr. Mohr until it was sent to Fitzgerald and copied to him. Ben Mohr played no part in the subsequent petition to EPA, and that did not include Dr. Mohr's signature as the principal investigator. The apparent change in status of the PIs was not conveyed to Dr. Mohr or the College of Engineering. Data from the project were released to EPA, without the knowledge of Dr. Mohr, by individuals who lack the specific education and experience to properly interpret the data or assess whether the experiments were conducted according to well-established standard protocols.
6. Independent professional experts at the EPA recently published the Agency's own study of glider vehicle emission tests that directly contradicts TTU's findings; refer to [5].
7. Mr. Brewer has stated that he and the technician did not receive any pay from the project. This further makes TTU susceptible to the charge of Conflict of Interest, since it appears that the testing was done with cost share from the university (not charging for the time spent by Tom Brewer and the technician) in addition to the fact that Dr. Soni reduced the indirect cost to only 10%, as opposed to the standard rate of 42%. The formal announcement made on Aug. 8, 2017 that Fitzgerald Glider Kits would fund a new building to house the TCIM further makes the apparent conflict of interest more troubling.
8. A resolution approved by a TTU Faculty Senate vote on January 30, 2018 called on President Oldham to issue a signed letter withdrawing all Tennessee Tech support from the study, and to suspend all present research activities and other associations with Fitzgerald, pending the results of the investigation. In his written response to Dr. Christy Killman, TTU Faculty Senate President, Dr. Oldham did not respond to those entreaties. As of the date of this memorandum, TTU has not renounced the study.

In summary, we are concerned that Dr. Oldham, Dr. Soni, and Mr. Brewer risked TTU's reputation and integrity by embarking on this project. They have publicly exposed the university to possible legal actions by advocating for a national policy change. Moreover they clearly violated university policies regarding the change of the PI, and conduct of externally funded projects. We urge the Faculty Senate to consider these facts when contemplating the future response to the actions of the TTU administration.

## REFERENCES

- [1] <https://www.epa.gov/sites/production/files/2017-07/documents/hd-ghg-fr-fitzgerald-recons-petition-2017-07-10.pdf>
- [2] <https://www.tntech.edu/news/releases/tennessee-tech,-tcat-livingston,-fitzgerald-companies-announce-new-partnership>
- [3] <https://www.edf.org/sites/default/files/content/EDF%20ELPC%20WE%20ACT%20Comments%20on%20Gliders%20Proposed%20Repeal%20final.pdf>
- [4] <https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0827-2416>
- [5] <https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0827-2417>

**CC:** Darrell Hoy, Interim Dean, College of Engineering  
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