



The North Carolina Bulletin

The Newsletter of the North Carolina Board of Examiners for Engineers and Surveyors

May 2016 Spring Issue



Inside this Issue

Board and Staff Directory	2	The Board and Proactive Enforcement	8
Never Question the Engineer's Judgment.....	3	Examination Statistics and Dates.....	10
Unmanned Aircraft Systems in N.C.	3	FE, FS and PS Examination Changes.....	10
Business Firm Renewals.....	6	Renewals and Continuing Education.....	11
Certificate Ceremonies: Winter 2016.....	7	Seal Brochure Updated.....	11
New Board Members Appointed.....	7	Disciplinary Actions	12



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Board Office

4601 Six Forks Road Suite 310
Raleigh, NC 27609

Telephone

(919) 791-2000

Facsimile

(919) 791-2012

Website www.ncbels.org



[North-Carolina-Board-of-Examiners-for-Engineers-and-Surveyors/](http://www.ncbels.org)



[@ncbels](https://twitter.com/ncbels)

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Editing and Design

Stephanie Bryant	<i>Updates</i>
Lou Ann Buck	<i>Editor/Content Manager</i>
The Signature Agency	<i>Graphic Design</i>

Board Staff Directory

Name Title	Email	Extension
Stephanie Bryant <i>Administrative Assistant</i>	sbryant@ncbels.org	100
Andrew L. Ritter <i>Executive Director</i>	aritter@ncbels.org	101
Mark D. Mazanek <i>Director of Business Licensure and Compliance</i>	mmazanek@ncbels.org	102
Shirley Ditt <i>Administrative Assistant</i>	sditt@ncbels.org	103
Martha Michalowski <i>CPC/Investigations Administration</i>	mmichalowski@ncbels.org	104
Laverne Barbour <i>Processor: Surveying Applications EI/SI Certifications</i>	lbarbour@ncbels.org	105
Lou Ann Buck <i>Director of Administration</i>	labuck@ncbels.org	106
Laura Parham <i>Processor: Professional Engineer Applications</i>	lparham@ncbels.org	107
Dawn Taylor <i>Administrative Assistant</i>	dtaylor@ncbels.org	108
David S. Tuttle <i>Board Counsel</i>	dstuttle@ncbels.org	111
William P. Casey <i>Board Investigator, Eastern Region</i>	wcasey@ncbels.org	104
Cathy W. Nicholson <i>Board Investigator</i>	cnicholson@ncbels.org	104
Clyde Alston <i>Board Investigator</i>	calston@ncbels.org	104
Tina Curran <i>Board Investigator</i>	tcurran@ncbels.org	104
David J. Evans <i>Assistant Executive Director/Investigations</i>	djevans@ncbels.org	113
John Stone <i>Information Technology Systems Specialist</i>	jstone@ncbels.org	115
Chimene Link <i>Renewals</i>	clink@ncbels.org	116

ON THE COVER: The mile-high swinging bridge at Grandfather Mountain, N.C.



“Never But Never Question The Engineer’s Judgment”

*by Stacey A. Smith, PE
Engineering Committee Chair*

Is what the sign says and has so for over 25 years in my office. I first looked at this sign as it hung in the office of Gregory N. Richardson, PhD, PE, our firm’s founder. Upon his retirement he left this sign behind to remind us of professional judgment. Perhaps the definition can be simply “googled” but I chose to pull out my worn Webster’s dictionary to define judgment as “an opinion or decision that is based on careful thought”.

Professional Conduct

In my first year on the Board, I have come to a deeper appreciation of just how important judgment is for our industry as engineers and surveyors. The complexity of our work not only increases yearly with technology but the speed with which decisions must be accomplished can, at times, work in contrast. Just as the definition highlights “careful thought”, it is up to the professional to control the schedule to comply with 21 NCAC 56 .0701 (Rules of Professional Conduct). In review of our disciplinary cases last year, it is easy to see how the schedule, the client, or the budget may drive a project, yet, in every case, the Professional Engineer or Surveyor will ultimately be subject to Board disciplinary proceedings. We must remember that our charge is to “safeguard the life, health, property, and welfare of the public.” This charge is not an option, it is a given and will remain paramount to the character and integrity of the single professional and as a whole to our industry. Without this fundamental canon, the trust that the public has bestowed upon us is gone.

Professional Judgment

One of our other Board duties, under 89C of the NC General Statutes, is to evaluate when an engineer is required. I recall Ralph B. Peck, PhD, PE on engineering judgment where he notes “some problems cannot yet be solved by mathematical analysis.” Our

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Unmanned Aircraft Systems (UAS) in North Carolina

*by Richard M. Benton, PLS
Board Vice Chair & Surveying Committee Chair*

Unmanned Aircraft Systems (UAS), Unmanned Aerial Vehicle (UAV), Drone, no matter what you call them, it seems you can’t pick up a professional magazine anymore without being bombarded by advertisements and articles for this newly emerging technology. Currently UAS are being used for agriculture crop land analysis, quantities, stock pile measurement, topographic surveys, utility line inspection, mineral exploration, geophysical surveys, search and rescue and disaster analysis just to name a few. As UAS become less expensive and more precise, its use among licensed professionals will increase. With this new technology comes the added responsibility to protect the public both on the ground and in the air. The Federal Aviation Administration (FAA) has exclusive sovereignty over airspace in the United States (49 U.C. Code) including the airspace above private property. The FAA establishes the operating rules governing that airspace in the form of Federal Aviation Regulations (FAR’s) which cover pilot and aircraft certification requirements. UAS are considered aircraft by the FAA and, therefore, subject to the FAR’s. All UAS must meet airworthiness standards and be registered with the FAA. Once approved, the aircraft is issued an “N” number, the same as that issued to general aviation aircraft, and must be visibly displayed on the UAS. To date, the FAA has preapproved approximately 1,120 UAS with the list being updated monthly. Currently, the FAA requires any aircraft operating in the National Airspace System (NAS) to be a certificated and registered aircraft, and be operated by a licensed pilot. The FAA has a projected date of June 2016 to roll out their new UAV rules.

In 2014, the North Carolina General Assembly established regulations for the use of UAS within the state. In addition to these regulations, North Carolina General Statute (NCGS) 63-95 and 63-96 assigned the responsibility of overseeing these

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... the Engineer's Judgment

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society tends to utilize computer-based tools in design with a misconception that it is infallible. The judgment that is required in both the input and the resulting output relies on "careful thought" to generate an appropriate decision incorporating one's total of education and experience. When a question is presented to our committees, we evaluate impact to the public and, fundamentally, if engineering judgment is required. The Board has established a number of policies and guidelines to help in determining when a situation may or may not require an engineer (www.ncbels.org/policies.html).

The Details

In this case, judgment vs. judgement and what is the difference. As for the sign, purchased in Philadelphia, we consider the difference in spelling something akin to old English. Noah Webster first stated the spelling of "judgment" in his American Dictionary of the English Language in 1828. Perhaps, he initiated the difference to American English from British English, but judgment is generally accepted in our language today.

A Reminder

In business day traffic, we find a simple reminder of what our sign means to us as follows:

- Develop one's judgment through experience and education;
- Work with those that respect the profession and use good judgment;
- Develop a reputation built around character and integrity;
- Manage projects to never sacrifice our true charge to safeguarding the public;
- Recognize the Professional Engineer in each situation will bear the ultimate responsibility; and
- Pay attention to the details.

In my first year, I have gained greater respect for our industry and its professionals and have been proud to serve this Board and all of its committed members and staff. We endeavor each day to maintain North Carolina as a national leader and each professional can do their part. In the words of Dr. Peck, "Engineering is indeed a noble sport, and the legacy of good engineers is a better physical works for those who follow them." I agree.

Unmanned Aircraft Systems

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regulations to the North Carolina Department of Transportation Division of Aviation (NCDOT/DOA). Although North Carolina's UAS regulations are not intended to duplicate the federal regulations, they do establish the types of UAS activities allowed and govern the use of UAS technology in the state. NCDOT/DOA is responsible for regulating all government (public) and commercial UAS operations including implementing the Knowledge Test, issuing NC commercial and government UAS operator permits, and serving as the primary point of contact for all state-related UAS issues. In addition to federal and state regulations, local governments may also adopt ordinances concerning UAS launch and recovery. Certain national parks, including some of those located in North Carolina, prohibit UAS unless approved in writing by the park superintendent.

As mentioned earlier, NCDOT/DOA is responsible for administering the Knowledge Test for anyone planning to use a UAS in North Carolina. This test must be passed by anyone desiring to operate a UAS, regardless of type or purpose, prior to any operation within the state. The only exception to this is if the UAS will be operated under the authority of a federal agency (owned and operated by the agency) or operated under contract to the agency.

All UAS operations are classified as either Recreational, Government, or Commercial. Recreational Operation (model aircraft) is defined in G.S. 63-1 as an aircraft that is mechanically driven or launched into flight and that meets the following requirements: a) is flown solely for hobby or recreational purposes, and b) is not used for payment, consideration, gratuity or benefit, directly or indirectly charged, demanded, received or collected by any person for the use of the aircraft or any photographic or video produced by the aircraft. Federal statute requires model aircraft to be flown strictly for hobby or recreational purposes. Government Operation (public aircraft) is defined as government entities that use UAS to carry out their functions including public schools and universities. Government operators must obtain a federal Certificate of Authorization (COA) from the FAA, take and pass the NCDOT's Knowledge Test and apply for a state permit. Commercial Operators (civil or non-government) are defined as a person or company using UAS technology for compensation or business purposes. This includes any person or company using a UAS in any way to advertise, promote or demonstrate a

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Unmanned Aircraft Systems

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product or service even if the product or service itself does not include a UAS, UAS derived photography, etc. An example of this would be a developer using a UAS to photograph aerial views of a subdivision development for use in a sales brochure. In this case the UAS was used for advertisement and is therefore considered commercial use. Engineers and Surveyors using UAS for inspections, aerial photography, topographic surveys, etc. is considered commercial use even if intended for in-house use only. All Commercial Operators must receive a Section 333 Exemption or a Special Airworthiness Certificate from the FAA. All Commercial Operators are required to take and pass the NCDOT's Knowledge Test and then apply for a state permit prior to using the UAS on any project in North Carolina. Commercial Operators must follow all legal requirements to ensure safe and responsible flight and agree to the following terms and conditions:

- Permit valid for Commercial UAS Flight Operations in N.C.
- This permit shall not be represented as a valid Airman's Certificate, Pilot's License or the like and is not a valid substitute for those credentials.
- This permit shall be in the possession of the Permitted Operator during all Commercial UAS Operations conducted in N.C. Operator must be able to produce this permit upon demand when conducting UAS operations.
- Permitted Operator must obtain from the FAA a valid Airspace Authorization for Commercial Operations covering the type of UAS being operated, the type of operation being conducted, and the geographic area, airspace and altitudes at which the UAS is being operated.
- This permit shall not be used as proof of valid Airspace Authorization from the FAA. Proof of valid FAA-issued Airspace Authorization must be in the possession of Permitted Operator during all Commercial UAS Operations.
- All documentation and credentials required by the FAA and the State for Commercial UAS Operations must be in the possession of the operator during UAS operations to include; driver's license, N.C. UAS Operator Permit, FAA-issued Airspace Authorization documents and Airman's Certificate for the pilot in command if required by the operator's FAA-issued Airspace Authorization.
- By accepting this permit and operating a UAS for commercial purposes in N.C., operator agrees to abide by all



federal, state, and local laws, regulations and ordinances governing commercial UAS operations in the operational area.

- By accepting and using this permit, operator agrees to operate according to all requirements, restrictions and guidelines outlined in the operator's FAA-issued Airspace Authorization for Commercial UAS Operations.
- The Permitted Operator assumes all risks and liability associated with the operation of a UAS and the use of the products associated with or derived from each UAS operation.
- Through the issuance of this permit, the NCDOT makes no representation as to the skill of the operator as it relates to operation of a particular UAS type or the skill of the operator in conducting a particular type of mission.
- NCDOT shall not be held liable for any conduct of Permitted Operator or resulting effects of the UAS operation before, during or after UAS operations. Furthermore, Permitted Operator agrees to indemnify and hold harmless NCDOT for any action or result of a UAS operation conducted under this permit.

These requirements, terms, and conditions emphasize the legal gravity of using UAS in North Carolina. The public's safety, on the ground and in the air, depends on us as professionals adhering to all requirements set forth by the FAA and the NCDOT/DOA. As professional engineers and surveyors we have an obligation to protect the health, safety and welfare of the public. Licensees who operate UAS without all the proper certifications and license are in violation of federal and/or state regulations and place not only the public safety in jeopardy, but their professional license as well. The FAA has multiple options available for enforcing

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Unmanned Aircraft Systems

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regulations. These range from education to administrative actions in the form of a formal warning notice or letter of correction, to the ability to access civil penalties up to \$27,500. Criminal penalties include fines up to \$250,000 and/or imprisonment for up to three years. 89C-21(a)(3) authorizes the North Carolina Board of Examiners for Engineers and Surveyors to discipline licensees by reexamination, revocation, suspension, reprimand, or civil penalty for "Conviction of, or entry of a plea of guilty or nolo contendere to, any crime that is a felony, whether or not related to the practice of engineering or surveying; conviction of, or entry of a plea of guilty or nolo contendere to, any crime, whether a felony, misdemeanor, or otherwise, where an essential element of the crime is dishonesty or when the crime is directly related to the practice of engineering or surveying; or conviction of, or entry of a plea of guilty or nolo contendere, of any crime involving moral turpitude."

It is the responsibility of the professional licensee to mitigate potential violations involving the use of UAS in North Carolina by ensuring all federal, state, and local requirements have been met prior to the use of UAS technology. It is important to note that UAS technology is like any other tool available to the professional and, therefore, must be used in a way that meet current engineering, surveying, and mapping standards and procedures. The Rules of Professional Conduct per 21 NCAC 56 .0701(g)(2) requires a licensee who has knowledge or reason to believe that another person or firm may be in violation of the Board Rules (21 NCAC 56) or of the North Carolina Engineering and Land Surveying Act (G.S. 89C), to present such information to the Board in writing in the form of a complaint and shall cooperate with the Board in furnishing such further information or assistance as may be required by the Board. This should in no way be construed as an attempt to limit competition in this rapidly growing technology but as a duty to protect the public as charged under North Carolina General Statute Chapter 89C-2 *"In order to safeguard life, health, and property, and to promote the public welfare, the practice of engineering and the practice of land surveying in this State are hereby declared to be subject to regulation in the public interest."*

For more detailed information concerning the use of Unmanned Aircraft Systems please visit the Federal Aviation Administration's website at www.faa.gov/uas/ and the North Carolina Department of Transportation, Division of Aviation's website at www.ncdot.gov/aviation/uas/.

Business Firm Renewals

The 2016 Online Firm Renewals will begin June 1, 2016. No Firm may renew before June 1, 2016. Effective last year, firms are no longer mailed an annual license. All firms will complete the online renewal and submit it the same as last year. The submitted renewal goes into queue until Board staff reviews it for compliance with North Carolina Statutes and Board Rules. Once the firm renewal is reviewed and approved by staff, an email will be sent to the primary email address listed on the firm renewal notifying the firm that the renewal was processed and a copy of the annual license can be printed by going to the Board website (www.ncbels.org) and clicking on License Lookup. The email will contain directions to print the annual license.

Since the approval notification will be sent via email, it is important that all firms provide an updated email address on the renewal when submitted. In addition, firms should make sure that the Board email is on the firm's safe list to avoid the email being sent to a spam folder.



All Professional Corporations and Professional Limited Liability Companies must account for 100 percent of the total shares of stock or membership of the entity on the renewal. If shares or membership do not total 100 percent, the entity will not be permitted to submit the online renewal.

At the end of May each licensed firm will be mailed a postcard to the address the Board has on file containing instructions on how to renew the firm's license online. The firm renewal fee for 2015-2016 is \$75. Unless renewed, all firm licenses expire on June 30, 2016.

For any business firm questions, email Mark Mazanek, Director of Business Licensure & Compliance, at mmazanek@ncbels.org or call (919) 791-2000 x 102.