



From: Gary Polson
PropellerSafety.com
P.O. Box 1381
Stillwater OK 74076

28 October 2014

To: Department of Homeland Security
U.S. Coast Guard

**Reference: Docket No. USCG-2014-0911
Recreational Boating Safety Grants for Nonprofit Organizations**

Thank you for the opportunity to comment.

Public Comment:

We propose two additional areas of interest for grants:

- 1. Survey kill-switch lanyard wear rates (visually and by mail or email).**
- 2. Test ability of boat operators to quickly assimilate and understand phrases currently used for kill switches / kill switch lanyards.**

Introduction

Both proposed areas of interest focus on kill switches. The first is a survey of kill switch lanyard wear rates. The second questions the effectiveness of phrases currently used as substitutes for "kill switch" and "kill switch lanyard".

Over the years USCG has issued several reports and made numerous proposals concerning the incorporation of kill switches, their use, and the number of accidents that could have been prevented if they had been used.

"In 1975, the Coast Guard's Marine Safety Technology Division of the Office of Research and Development estimated that 18 fatalities on jonboats and 99 fatalities on other types of boats could be prevented by such means, using sampling theory and engineering judgment."¹

¹ Presentation of 1975 and 1977 Reported Boating Fatalities Preventable by a "Kill Switch". USCG. March 1979.

The 1979 study quoted above reviewed 1975 and 1977 accidents. The study adjusted the number of preventable accidents for the recent incorporation of neutral start switches and for non-swimmers. They arrived at an estimate of 39 lives saved per year.

A 2008 USCG study² used two techniques to review 2002 through 2006 accidents (five years of data). One found 89 preventable fatalities with another 17 possibly preventable fatalities. The other technique identified 63 preventable fatalities.

The boating industry says the use of kill switch lanyards is “the solution” to the boat running away, or circling in the “Circle of Death” when the operator is ejected or falls overboard while underway.

If it is the “solution” why are so many people being injured and killed. Either the kill switch lanyard system does not work properly or it is not being used. The industry says they work. That means they agree they are not being used.

Can a solution be “the solution” when it is not being used?

With no data on kill switch wear rates, its hard to encourage USCG, boating safety organizations, the industry, and entrepreneurs to address wear rate issues. This grant could supply that data and be the first step in decreasing the number of annual fatalities and injuries attributed to failure to attach kill switch lanyards.

In addition, we see a wide range of phrases used by the industry in operator manuals and on warnings to represent “kill switches”. We fear their message is not being understood by some boat operators. Thus we propose a study of the ability of boat operators to quickly understand the phrases currently used to represent kill switches and kill switch lanyards.

Details for both proposed areas of interest follow.

² Casualties Preventable by the Use of an Engine Cut-Off Switch. USCG Office of Auxiliary and Boating Safety. May 14, 2008. Revised October 16, 2009.

1. Survey kill-switch lanyard wear rates

We propose a smaller scale, pilot study version of the Life Jacket wear rate study already proposed by this notice (Number 5 on your list and copied below).

“Life Jacket Wear. The grantee in this possible area of interest would provide reliable estimates of nationwide recreational boater life jacket wear rates. This estimate will directly address the National Recreational Boating Safety Strategic Plan’s Strategy 4.1 – *Track and Evaluate Life Jacket Wear Rates*. Estimates could be developed on an annual or biennial basis, using paid or volunteer observers, and must be based on actual observation of a representative sample of boaters on high-use lakes, rivers, and bays. Methods for developing estimates must be replicable from year to year and must be able to collect data by number, type, length, operation, and activity of boats and by boater age and gender.”

In 2011, USCG themselves asked for kill switch wear rate data in USCG-2009-0206 ANPRM: Installation and Use of Engine Cut-off Switches on Recreational Vessels. Item #26 of Section V. Information Requested is copied below.

26. What is the voluntary use rate of engine cut-off switch devices in States without engine cut-off switch device laws?

No such information beyond our calculations based on wear rates in BARD reported open motorboat accidents was received.

Possible Implementation Ideas:

1. A pilot study of kill switch wear rates could be conducted on a few lakes in a few states, including one state currently requiring the use of kill switch lanyards. Visual observations would be conducted similar to the life jacket wear study.
2. Data could be collected on the number of people in the boat, boat length, operation, activity, boat operator age, and gender, and an estimate of water conditions could be made (swell heights and water temperature).
3. Information could be quickly collected on some hardened tablets, like iPads, and maybe even grab a quick photo not for public release but for the grantee’s use in reviewing the data for accuracy.
4. States/lakes could be selected to include a broad span of powerboats and activities. No data would be collected for PWCs, vessels above 26 feet, or cabin boats.

The pilot study could work out any kinks for a possible future larger study based on their results.

Similar Survey by Mail / eMail

We propose a similar pilot survey of kill switch wear rates could be simultaneously performed by U.S. Mail of random boat owners, or by email from organizations with boaters as their members (such as BoatUS). While BoatUS and similar groups may not offer a random group of boaters, they would at least provide a data point on a kill switch wear rate chart that is currently blank.

Potential Implementation Ideas:

1. Boat operators could be asked similar questions to the visual survey about their last outing. In addition they could be asked to:
 - a. Identify the state in which they most frequently operate a boat
 - b. Identify if they normally use a traditional lanyard or a virtual/wireless lanyard
 - c. Estimate the percentage of time on the water, underway they normally attach their kill switch lanyard or engage their virtual lanyard. They would do so by marking one of a few boxes indicating different percentage ranges, such as 0 percent, 1-10 percent, 11-20 percent, 21-40 percent, 41-60 percent, etc. We are not certain what the best ranges to properly scatter the data might be. The visual survey might be able to provide some input into establishing these ranges.
2. The mail/email survey could span some of the same geographical areas as the visual survey, plus extend to some additional States as well.
3. The returned portion of the surveys could be nameless and not coded by numbers to assure boat operators remain anonymous.

Mail/email and visual surveys for similar areas could be compared and contrasted. If kill switch lanyard wear rates are found to be low:

1. The industry may consider other solutions and/or more effective warnings.
2. USCG and other boating safety groups may consider turning to Public Service Announcements, regulatory action, or other tools to raise awareness of the need for attaching kill switch lanyards (real or virtual) and the consequences of not using them.

We recognize the use of virtual lanyards may not always be visible. The mail/email study may provide some insight into their market share and frequency of use.

Similarly, visual observations of traditional kill switch lanyard use will present some challenges. This grant could help develop those techniques.

2. Test ability of boat operators to quickly assimilate and understand phrases currently used for kill switches / kill switch lanyards

The boating industry does not like the phrase “kill switch”, even though it refers to killing the engine, not to killing boaters. As a result, there has been a proliferation of terms and phrases in recent years from boating companies, ABYC, USCG, NMMA, and others to represent the phrase “kill switch” or “kill switch lanyard”. We are concerned boat operators may quickly view warnings and instructions and not make the connection between the phrases currently being used and the intent of the warning or instruction.

Among those terms and phrases are:

- kill switch
- emergency stop lanyard (ESL)
- emergency stop switch
- self-circling switch
- kill cord
- stop switch
- lanyard stop switch
- safety lanyard
- engine cut-off switch
- emergency cut-off switch lanyard
- emergency engine cut-off switch (EECO)
- emergency engine stop switch
- emergency engine cut-off devices
- emergency engine-propulsion cut-off device
- ignition kill switch
- ignition interruption switch
- engine cut-off switch link
- safety shut-off device
- safety shut-off system
- stopping switchgear
- emergency cord

We are not certain what the “flavor of the week” phrase is right now. Recent ABYC documents use the phrase “safety lanyard” but we are not sure what that would make the kill switch (a safety lanyard switch? a safety switch?).

We suggest USCG visit with NMMA and ABYC to determine what phrases they are currently using and anticipate using in the near future, then test the recognition of those phrases and compare them with the recognition of “kill switch” and “kill switch lanyard”.

The industry is “betting lives” on boater operators recognizing these substitute phrases. Its hard enough to get boat operators to attach kill switch lanyards when they know what you are talking about. Adding a layer of confusion makes it even more difficult.

Possible Implementation Ideas:

1. Develop an on screen computer test that displays two or three images of boats with several safety devices and other common objects in plain view, including an operator with a kill switch lanyard attached in one or more of the photos. The images could be photos selected from the USCG Office of Boating Safety online image library, or they could be graphical images similar to those used by BoaterExam.com.
2. Display all the boat images (maybe three total) at once and give the boater 30-45 seconds to review them.
3. The computer continues to display the two or three images while it now randomly displays the name of an object on the boat (“fire extinguisher”, “steering wheel”, “life jacket”, “anchor”, “oar”, “fishing rod”, “cleat”, “hat”, “propeller”, etc.) The boater is instructed to click on the object as soon as the computer displays the term or phrase. The computer randomly displays the name of one object at a time and records the time required for the boater to respond by clicking on an object and what object they clicked on. Terms or phrases to be tested for kill switch lanyard recognition could be intermixed with the other terms and phrases.
4. Instruct the boaters that if more than one of the objects requested is visible, just click on any one of them. For example if the displayed term is “life jacket” and several life jackets are visible in the images, just click on any of them. You might even mixup “PFD” and “life jacket” and learn something about the ability of boater operators to recognize those terms as well.
5. The computer display includes an “I am not sure” or “I don’t know button” for boaters to click on if they have no idea what to click on.
6. The system could also ask them to enter some very basic data by selecting:
 - a. One of several age groups
 - b. Gender
 - c. One of a few ranges of boating experience in years
 - d. The state they spend the most time boating in
8. Accuracy and response times for the kill switch phrases could be compared with those of the other boating terms/phrases.
9. A large group of boat operators could be guided into a room at a boat show by offering free food, some sort of entertainment, given a free sample of something, or be given a \$5 voucher good at the concession stand as they were gradually, individually pulled aside and asked to respond to the survey.
10. A few computer stations setup somewhat like voting booths could quickly process many boaters. Individual boaters could be tested in just a few minutes. A similar test using a pointer and timer could be devised for those uncomfortable with computers.

11. Create an alternate version of the test in Spanish using the terms the industry currently uses in Spanish.
12. Conduct the test in at least one region with a large population of hispanic boat operators and provide translators if needed. Test them with both the English and with the Spanish versions of the test. The order of those tests could be randomly selected.

We recognize boat show attendees are not a totally random population of boaters.

Survey results could assist the industry in selecting the best substitute phrase, or they might decide to return to the original phrase, “kill switch”, based on the results.

Closing Thoughts

Please consider adding these two areas of interest to the grants package. A common saying, “If you can’t measure it, you can’t improve it.”, is derived from comments made by Lord Kelvin well over a hundred years ago:

“I often say when you can measure what you are speaking about and express it in numbers you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be“.

It is time to advance beyond knowledge of a meager and unsatisfactory kind. Kill switch wear rate estimates will drive programs to increase their use, for developing alternative approaches, and for improving warnings. All of which can save lives.

Similarly, measuring the ability of boat operators to recognize substitute phrases currently being used for “kill switch” and “kill switch lanyard” will determine if the current phrases are needlessly costing the lives of boaters.

Thank you for your consideration of these two areas of interest for grants.

Gary Polson

PropellerSafety.com