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Adoption of Cost-effective Roll Over Protective Structures (CROPS) on Farm Tractors: an r2p Perspective

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Abstract

Objectives: Cost-effective Roll Over Protective Structures (CROPS) were designed to meet identified needs of the end users (farm tractor owner/operators). CROPS addresses identified barriers to ROPS retrofitting: less costly than many commercial ROPS and "hassle factors," i.e., having to take the tractor to a dealer, trying to find a retrofit ROPS for a tractor, the complexity of the retrofit modification, usability of the tractor after retrofit, and storage of the tractor with a ROPS. To overcome these, NIOSH designed prototypes of a CROPS. Projected retrofit costs were $450, compared to an average of $1,000 and the installation complexity was significantly reduced. NIOSH developed CROPS prototype designs for four tractor models: Ford 3000 series, Ford 4000 series, Ford 8N and Massey Ferguson 135. These four tractor models account for over 1/3 of the tractors which are estimated to not have ROPS on farms. Additionally, these CROPS designs can be cross referenced and likely installed on 37 other tractor models, increasing their scope of coverage. CROPS epitomize the research to practice (r2p) process. In total, this has been an eight year undertaking from the conceptualization process to getting the CROPS into the field.

Methods: With the assistance of state partners, the demonstration phase of the project identified the study population-farmers in two selected states who use tractors which a NIOSH CROPS prototype fits. New York and Virginia were selected because of their high number of tractor roll over fatalities and well established relationships with NIOSH, its partners, and their states' farm population. These state partners/collaborators were essential to the success of the project. They identified the study population, arranged the dates/times for the installation and provided support at the sites. All twenty-five farm tractor owner/operators self-selected in each state to participate in demonstrating retrofitting a CROPS onto their tractor, identifying and allowing friends and neighbors to observe the process at their farm and completing surveys regarding the process. NIOSH personnel were on-site to provide tools, retrofit assistance and deliver the specific model of CROPS.

Results: CROPS retrofitting in New York state was completed in the fall of 2010 with 25 CROPS demonstrators participating and 45 observers attending the CROPS demonstrations (Observers: range=0 - 5, mean=1.8, median=2, mode=0). The NY state farm tractor owner/operators were grateful to be included in the CROPS program and pleased with the outcome of the CROPS installation. Virginia is scheduled to conduct 25 retrofits during spring/summer of 2011.

Conclusions: Adopting safety interventions such as ROPS in agricultural communities has proven to be difficult. The NIOSH designed CROPS were in response to stakeholder input and a step in overcoming identified barriers. If enough demand is created for the CROPS, then it is feasible they will become a commercially viable option. Direct interaction with the study participants/farmers in an actual field setting provided valuable information not obtainable in a laboratory setting (i.e., feedback from the farmers has already improved the installation instructions).

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Signaling and Mayday: Training Vietnamese Shrimp Fishermen of the Gulf Coast

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Abstract

Background: The commercial fishing trades are among the most dangerous jobs in the world. In the United States, the Eighth Coast Guard District has the second highest level of vessel losses and crew fatalities among commercial fishermen. Preparation of commercial fishermen for emergencies aboard fishing vessels can enhance crew survival.

The current study examines how occupational morbidity and mortality among commercial fishermen along the U.S. Gulf Coast may be influenced by cultural factors and attitudes/beliefs toward occupational exposures and workplace risk factors. During the study it became apparent that language was a significant barrier among Vietnamese shrimp fishermen learning sound signals and making mayday calls. The U.S. Coast Guard (USCG) has reported multiple navigational incidents resulting from failure to properly signal or communicate ship-to-ship via VHF radios. Poor outcomes from emergencies have been the result of failure to effectively perform a mayday call.

Methods: Two key skills identified by the USCG for training are sound signaling and executing a mayday call. Reported training obstacles have been lack of knowledge and language barriers. A model was built replicating a vessel's steering wheel, speed control, horn blast, and radio, in order to simulate the bridge of a fishing vessel. Professional video/audio footage of approaching freighters was produced. Using this footage, vessel captains were instructed by an experienced mariner in Vietnamese how to listen to and signal approaching vessels with the horn. A tip card, with English and Vietnamese instructions, guides practice of the mayday call.

Results: This training has been well received by Vietnamese shrimp fishermen along the Texas and Louisiana Gulf Coast. From 2004-2010, over 500 fishermen were trained (including repeats). The Coast Guard Authorization Act of 2010 has since introduced a new provision requiring individuals in charge of the vessel to pass a training program which includes, among other things, collision prevention, navigation, and ability to communicate in an emergency situation. In response to this prior experience and these new regulatory requirements, the NIOSH Southwest Center for Agricultural Health, Injury Prevention, and Education, in collaboration with USCG Commercial Fishing Vessel Safety, has developed an interactive CD to teach captains critical information about navigational sound signals and the execution of a mayday call. It has been produced in three languages (English, Vietnamese, and Spanish).

Conclusions: The findings of a larger study pointed to an important cultural barrier thought to have an impact on occupational morbidity and mortality. The resulting hands-on training module and CD serve as examples of research to practice (r2p), coincident with new regulation which mandates certification of these competencies or skills. It further illustrates the importance of partnerships and considering cultural factors, including language, in the design and delivery of workplace safety training interventions.

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