

Planning and Development of Mock Accident Scenarios

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Author Biographies

Authors teach in the Safety Sciences Department at the University of Central Missouri.

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Larry Womble, MS, is the interim chair of the Safety Sciences Department. He has over 30 years experience in safety and health with an extensive Mine Safety & Health Administration (MSHA) and construction safety background. His professional interests include workers' compensation, accident investigation, legal aspects of safety health practice, and industrial training.

Abstract

This presentation will describe the use of full-scale mock accident scenarios as a capstone experience for safety students. Descriptions and photographs of five different scenarios will be provided. Discussions will include step-by-step information about the planning and development of the scenarios, and will include a variety of possibilities for student involvement. Information about successfully executing the scenario the day of the event will be included along with criteria for evaluating student performance.

Introduction

Academic Safety Programs strive to give students as much “real world” experience as possible while they are earning their practitioner degree. Walk through surveys, laboratory sampling and analysis, job shadowing, internships, and full scale exercises all help provide students with a realistic sense of a safety professional’s world.

The Department of Safety Sciences at the University of Central Missouri (UCM) has implemented mock accident scenarios to provide students with the opportunity to apply classroom skills in real world situations. Mock accidents involve victims (humans or mannequins), full size equipment, and response personnel that can include fire, police and

ambulance crews who arrive and respond in real time. The scenarios promote problem-based learning, which is an effective tool for teaching safety students (Ramsay and Sorrell).

Planning and Development

The planning committee was initially composed of five departmental faculty and has grown to include faculty and staff from other campus departments. Additionally, students have helped develop and stage several of the scenarios. Student participation provides a unique perspective to the planning process and has generated some excellent learning opportunities. The planning committee also works closely with the campus office of public relations to develop press releases for both the campus and local newspapers. Additionally, an audiovisual specialist from the Library on campus films the scenarios for departmental and university use.

Perhaps the key to the successful growth of the scenarios was the caution the team used in planning the initial scenarios. Scenarios may be static scenes ready for investigation or may employ full emergency response participation. Static scenes are simpler and require significantly less coordination and control. It is recommended that organizations begin with static scenes and gradually increase the complexity of the scenarios over time. The department's first scenario included a victim, one witness, a coroner and an OSHA compliance specialist. Subsequent scenarios grew to include multiple victims and witnesses, the fire department, local and state police, the ambulance district, campus public safety and hazardous materials response personnel, and a life flight helicopter (see exhibit 1).



Exhibit 1. An Air Evac Lifeteam helicopter prepares to transport a victim.

Another critical component to staging successful exercises is garnering support from campus administration. In the beginning, the committee obtained written permission from university administration to conduct the scenarios. After three semesters, it became an expected activity and the formal process became unnecessary. The committee worked through a number of issues, including acquiring permission to “walk on the grass” and making substantial efforts to advertise

the scenario in advance so passers-by would not panic and think the incident was real. The department stages the scenarios in a high profile area of campus to attract student interest as they pass between classes.

The immediate plans are to continue to develop different scenarios to expand our repertoire to at least ten different mock accidents. This will enable undergraduate students to experience multiple scenarios without seeing the same one twice. Specific ideas for additional scenarios include a high rise rescue, trench collapse, and a possible workplace violence incident. A second goal is to incorporate additional features to make each mock accident more realistic. The most recent scenario included the use of moulage, which added an additional air of realism to help student investigators acquire the mind-set of investigating a serious accident.

Scenario Investigation, Analysis and Recommendations

The day of the scenario, the necessary equipment is staged at the appropriate locations. Large signs reading “Mock Accident Scenario” are placed in several locations to help ensure that the public is aware that it is only a drill (see exhibit 2). For the static scenes, key witnesses are placed



Exhibit 2. A combine is set up for an agricultural accident scene.

on-site. For the full scale exercises with emergency response players, a live emergency call to 911 typically sets the action in motion. Once emergency response personnel have cleared the scene, student teams begin their accident investigations. Student investigative teams are expected to conduct interviews, photograph the scene, take relevant measurements, and “contact” appropriate local or regional agencies such as emergency personnel or OSHA (see exhibit 3).



Exhibit 3. Students interview emergency response personnel.

Once the students have concluded their investigations, they have until the next class period to prepare a formal presentation. Student must determine what conditions and behaviors may have contributed to the accident, outline and cite specific violations of safety regulations, and must recommend control measures for preventing similar accidents in the future. Students utilize Power Point or a poster presentation to outline their findings. A panel of faculty grade the presentations based on accurate analysis of the scene, effective use of documentation such as photographs and measurements, and appropriate recommendations. Additionally, students are graded on their written and oral communication skills and on their ability to interpret the facts available without interjecting supposition or information not in evidence.

Summary of Selected Scenarios

The Department of Safety Sciences has conducted seven different scenarios over the previous three-and-a-half years. Information on five of these scenarios is included below.

Scaffolding Fatality

The department's first accident scenario was a scaffolding fatality in the spring of 2004. The scene was static, with the victim still present as the student investigators approached (see exhibit 4). A coroner declared the victim dead and she was removed from the scene. One witness was provided for students to interview. The witness was in the vicinity of the incident, but did not witness the actual events relating the fatal fall. One of the key players in this scenario was an OSHA Compliance Assistance Specialist out of the Kansas City office. He explained what students could expect from a compliance officer responding to a fatality and helped the teams recognize many of the violations associated with the scaffolding.



Exhibit 4. Scaffold violations contribute to worker fatality.

Confined Space Rescue

In the spring semester of 2005, the investigations centered on a confined space rescue. Two workers were conducting a confined space entry. While one worker left to retrieve some equipment, the second worker entered the confined space despite instructions to wait. The air testing had not been completed at this time. When the co-worker returned, he discovered his colleague inside the confined space rambling and incoherent. Emergency crews were dispatched in response to a 911 call and the fire department conducted the rescue (see exhibit 5).



Exhibit 5. Emergency crews rescue worker trapped in confined space.

Multiple Injury Electrocution

In the fall of 2005, the mock accident scenario was an electrocution involving three victims. A temporary hire was electrocuted when he plugged a make-shift extension cord (missing the

ground) into a grounded outdoor plug. The employee immediately began to shake and convulse. Hearing the employee yelling, a bystander grabbed the employee and was also shocked. A third individual then tried to render aid, and he in turn was shocked. Finally, another onlooker called for help. Ambulance crews were dispatched and victims were transported to the hospital.

Hazardous Materials Mobile Tank Spill

One of the larger scenarios was a vehicle accident involving a portable agricultural sprayer tank. A second vehicle backed into the tank, causing it to roll over and crush the victim. The tank sprang a leak and sprayed the chemical on the operator and the scene. There were no markings on the tank indicating its contents. Hazardous materials personnel, local law enforcement, ambulance crews, the fire department, and a life flight helicopter responded to the scene (see exhibit 6).



Exhibit 6. HazMat workers assess the scene.

Multiple Injury Motor Vehicle Accident

In the spring of 2007, the scenario involved two motor vehicles and a bicyclist. A university vehicle with nine passengers swerved to avoid a bicyclist, causing a rollover incident. Another car rear-ended the vehicle causing more injuries (see exhibit 7). Four ambulance crews, the fire department, city police, and the Missouri State Highway Patrol responded. Life Flight arrived and transported three victims to the local hospital. Three witnesses were available for questioning. Moulage was utilized to create a more realistic accident scene.



Exhibit 7. Rollover accident results in multiple injuries.

Conclusion

The mock accident scenarios are an effective way to provide safety students with real world experiences that enhance their coursework (Blunt and Zey). The scenarios have helped establish positive working relationships with community first responders and the university. Students often cite the investigations as the highlight of their semester. In the future, the authors are interested in looking for ways to expand the scenarios to include multiple universities and collaborations with industry.

Bibliography

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