



National Institute for
Occupational Safety and Health
Centers for Disease Control
and Prevention (CDC)
200 Independence Avenue, SW
Washington, DC 20201

1 July 2004

Mr. John McKnight
Director, Environmental and Safety Compliance
National Marine Manufacturers Association
444 North Capitol Street, Suite 645
Washington, D.C. 20001-1559

Dear Mr. McKnight:

During this past summer, Genmar Holdings, Inc. requested the National Institute for Occupational Safety and Health (NIOSH) to investigate occupational exposures to styrene during the production of Fiber Reinforced Plastic (FRP) parts in boat manufacturing, specifically focusing on the Virtual Engineered Composite (VEC®) process. Acting upon this request, engineers from the Engineering and Physical Hazards Branch (EPHB) of the Division of Applied Research and Technology (DART) have conducted a preliminary assessment of the boat manufacturing industry to determine the need for the type of research project requested. This assessment included an extensive literature search, a tour of Genmar's VEC® manufacturing facility in Little Falls, Minnesota, attendance at the International BoatBuilders' Exhibition and Conference (IBEX) in October 2003, and a meeting with the Environmental Committee of the National Marine Manufacturer's Association (NMMA). Based on the findings of this preliminary assessment, we are proposing a new project for Fiscal Year 2005 (beginning October 2004) to study the control of health hazards during the production of FRP boats. As a prelude, we plan to conduct an in-depth survey of Genmar's VEC® manufacturing facility during Fiscal Year 2004 as a pilot study for the larger research effort. This survey will include air sampling, noise monitoring and evaluations of applicable engineering controls.

The literature review conducted by the EPHB engineers looked at relevant publications associated with the manufacturing processes used to produce FRP parts, as well as the health hazards associated with those processes. Extensive information was found on both open and closed molding processes, but little recent data were available on exposures, particularly for closed molding.

In addition, little data were available on the occupational exposure impact of the soon-to-be implemented Maximum Achievable Control Technology (MACT) standards for Hazardous Air Pollutants (HAPs) promulgated by the Environmental Protection Agency (EPA). From this review of the literature, we have concluded that there is a need for research on the occupational exposures in boat manufacturing.

The tour of Genmar's VEC® facility and the attendance at the IBEX provided our researchers with a better understanding of both the availability and the extent of the different technologies available to the boat manufacturing industry. It is clear that several different closed-molding technologies are being used, including VEC®, and that several of these technologies may be well implemented and warrant further research regarding occupational exposures. While open molding is still being extensively used, a thorough study gathering data from multiple open and closed mold processes would likely provide manufacturers with information on which technologies have the increased capability to reduce worker exposures.

The meeting with the Environmental Committee of NMMA provided us with the opportunity to listen to the needs of the boat manufacturing industry, and for us to get buy-in for the proposed project. Although the committee members were initially reluctant to a NIOSH research project evaluating styrene exposures, by the end of the meeting, most members were at least cautiously supportive of a study. The committee members expressed their concern that focusing solely on closed molding processes would not be wise since they felt the highest exposures occurred during open molding. They specifically requested NIOSH to include a ventilation component in any boat manufacturing research project, to address ventilation system design in open molding. By including this ventilation component in the study, they felt we would be addressing the most urgent needs of the industry.

Based on the activities discussed above, NIOSH is proposing a research project to investigate the control of occupational health hazards in the boat manufacturing industry. This study will be a large control technology assessment, conducted in phases. This work will not be completed in a short period of time due to substantial number of in-depth surveys required, 5-7 being typical for this type of study. These in-depth surveys will include air monitoring for styrene as well as noise monitoring. Further, the evaluation of the ventilation systems for the open molding processes would complicate the study, since such work would likely include one or more intervention studies. Phase 1 of the study would include partnership development, walk-through surveys, and project planning, and would be completed in early FY05. Phase 2 would be completed in late FY05, and would focus on the project protocol and peer review, followed by the first two surveys of closed molding processes.

At the completion of Phase 2, a decision point would be reached as to whether to continue with additional phases of the project. If the data show a need for additional research, Phases 3 and 4 would be started. Phase 3 would add additional in-depth surveys of the closed molding process, and could be conducted during FY06. Phase 4 would be the evaluation and intervention study of ventilation for open molding processes, and could occur simultaneously with Phase 3. Additional surveys could be conducted during FY07 to assess the similarities and differences between the boat manufacturing facilities and other FRP manufacturing operations. Project reports, journal articles and other products would be completed during FY07.

As a pilot study, the in-depth survey at the Genmar facility will allow us to better design the research study for the entire industry. We would like to complete the field work for this survey before October 1, 2004, the end of our current fiscal year. As this process moves forward, we will inform you of the decisions made concerning the research project. We have also provided you a copy of our response to Genmar's request for this research. In the meantime, if you have any questions, please do not hesitate to contact me at (202) 401-6997.

Sincerely,

A handwritten signature in black ink that reads "J Howard". The signature is written in a cursive style with a long horizontal line extending to the right.

JHoward1@CDC.gov

John Howard, M.D.
Director

Attachment: Jacobs Letter