U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES ■ Public Health Service
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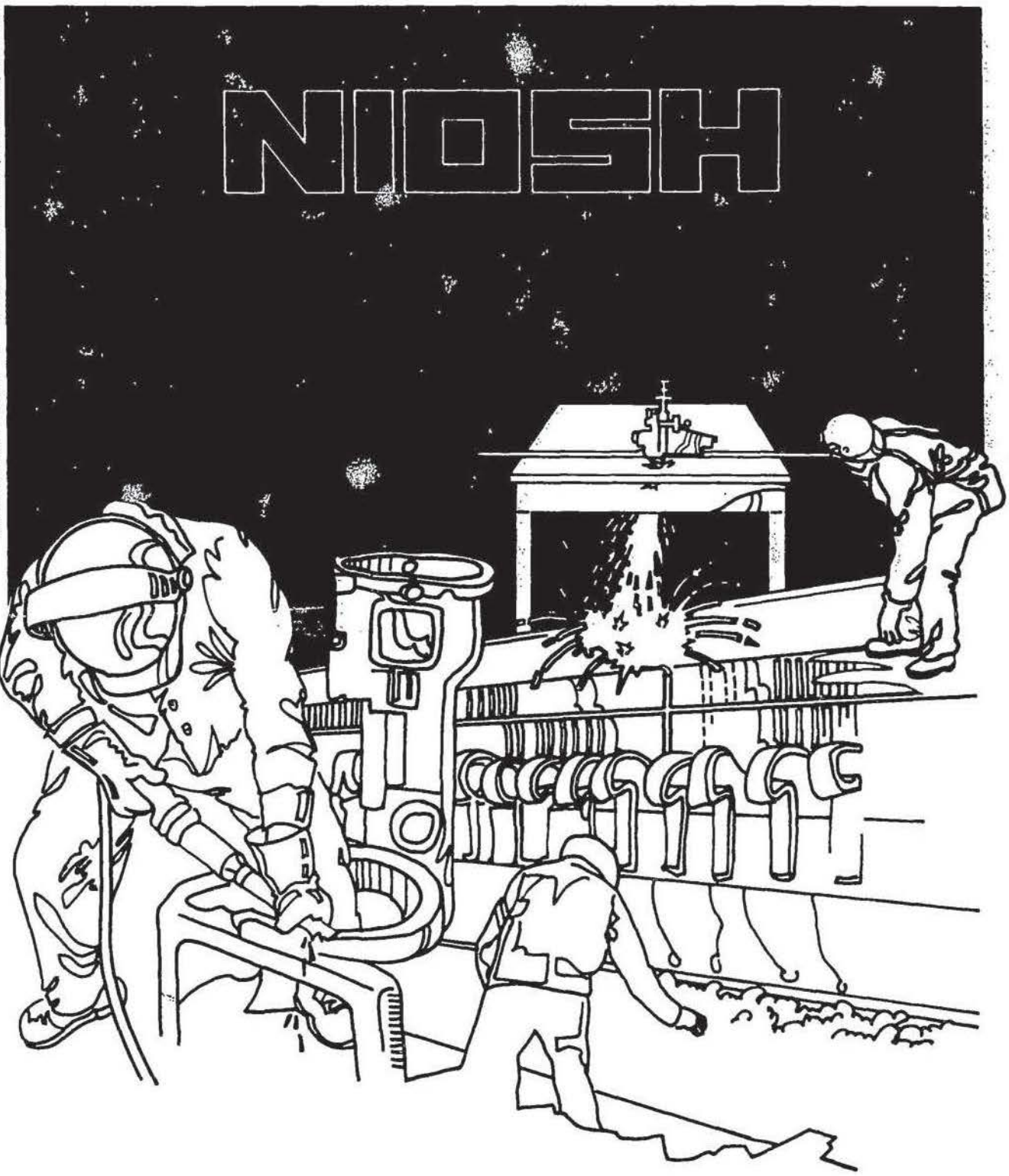

Health Hazard Evaluation Report

HETA 81-287-940
SKEETER BOATS
KILGORE, TEXAS

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 81-287-940
AUGUST 1981
SKEETER BOATS
KILGORE, TEXAS

NIOSH INVESTIGATOR:
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I. SUMMARY

NIOSH has begun an investigation of industrial exposure to Lucel-7, a foaming agent used recently in the reinforced plastic manufacturing industry. This NIOSH investigation follows a health hazard evaluation at a plant where neurologic damage occurred in several workers who had been exposed to this chemical.

On March 13, 1981, a NIOSH physician conducted a walk-through evaluation and employee interviews at a plant where Lucel-7 had been used, the Skeeter Boats Company in Kilgore, Texas.

The Skeeter Boats Company used only a small quantity of Lucel-7 for a relatively short time. The employees directly involved with the spray procedure were equipped with organic vapor respirators and rubber gloves. Except for one supervisor who had a transient episode of light-headedness, they did not experience any symptoms. Severe neurologic disease did not occur in employees who worked with Lucel-7 at this plant, probably because of the conditions of short-term exposure to relatively small quantities and the use of respiratory and skin protection.

KEYWORDS: SIC 3732 Boat Building and Repairing. 2-t-butylazo-2-hydroxy-5-methylhexane, Lucel-7, reinforced plastic, fibrous glass, neurotoxin, neurologic symptoms.

II. INTRODUCTION

In October 1980, the National Institute for Occupational Safety and Health (NIOSH) responded to a request for a health hazard evaluation at a reinforced plastic bathtub manufacturing plant in Lancaster, Texas. The request concerned evaluation of working conditions in which several employees had developed symptoms of central and peripheral nervous system dysfunction following exposure to Lucel-7 (2-t-butylazo-2-hydroxy-5-methylhexane), an azo foaming agent. Subsequently NIOSH instituted a broader investigation to evaluate the effects of Lucel-7 exposure in other plants. On March 13, 1981, a NIOSH physician conducted a walk-through evaluation and employee interviews at the Skeeter Boats Company in Kilgore, Texas.

III. BACKGROUND

Skeeter Boats is a fibrous glass boat manufacturing company which also produces several other fibrous glass products, including truck hoods, sun visors, and fan housings. The plant in Kilgore, Texas has been in operation for about seven years. From September, 1980 until the time of the NIOSH visit in March, 1981, their production had averaged about nine boats per day. During the summer of 1980 they had averaged about 6 boats per day.

The plant is housed in a building 600 feet long and 125 feet wide (75,000 square feet). Boat molds are manually moved through the several steps involved in spray-up production. Only two of the steps are performed in enclosed booths, the initial gel-coating and the final sanding. When Lucel-7 foam was used, the foam spraying was not done in an enclosed booth.

The building ventilation includes a fresh air intake system located in the rear wall and exhaust systems in the gel-coat and sanding booths. There are additional wall fans directed toward certain work areas that may become excessively warm in the summer months. Ventilation measurements by the company's insurance carrier were made in February 1981 and indicated that the exhaust flow in both gel-coat booths was greater than 200 cubic feet per minute.

The first production step involves waxing the mold to ensure that the finished boat hull can be removed without difficulty. The mold is then moved into one of two parallel spray booths for gel-coating. The gel coat is a pigmented polyester resin which is sprayed on with a catalyst, methyl ethyl ketone peroxide (MEKP). The spray gunner routinely wears an organic vapor respirator for this step.

After the gel coat step, the mold is moved out of the spray booth for the "chop" step. Chopped fibrous glass is sprayed on with a mixture of MEKP and resin. This is followed by a roll-out step in which several workers use hand-held rollers to ensure the chop layer is applied smoothly and evenly.

When Lucel-7 was used in production, the mold was then pulled up the line from the rolling area and one gunner would spray up a mixture of Lucel-7 and resin. The Lucel-7 was used undiluted and new spray gun equipment was bought for its use. After the Lucel-7 step, the previously described chop step would be repeated.

Without the Lucel-7 step, the mold is moved from the roll-out area to one of two sanding booths where it is trimmed and sanded. Workers in this step wear nuisance dust masks and earmuff hearing protection. The completed hull is then removed from the mold and fitted with lights, carpet and other accessories.

Gloves are available for employees in all of these steps, but their use is not required. During the NIOSH visit, nuisance dust masks were being worn by employees in the sanding booths. Organic vapors respirators are currently required only for the gel coat step; they were also required for the foam spray gunner when Lucel-7 was in use.

The company had begun using Lucel-7 in June, 1980 following a demonstration given in their plant by the representatives of the Reichhold Chemical Company. Skeeter Boats had used a total of 11 to 13 gallons of Lucel-7 between June and November, 1980. The plant's original supply of the chemical was pale yellow, but the Lucel-7 was subsequently delivered from Lucidol with a blue dye added. Skeeter Boats discontinued use of the chemical after notification by NIOSH and the manufacturer of Lucel-7 about the neurologic problems which had developed in several workers at another plant following exposure to the chemical.

The most extensive use of Lucel-7 at Skeeter Boats was in July, 1980, when it was used in production of 5 amusement-park round boats. This operation was done over two weeks, during the July vacation break, when there were only about six to eight people in the production area of the plant. Almost all the Lucel-7 spray work was done by one supervisor.

In September 1980 Lucel-7 was used for production of small "john boats". The resin used with the Lucel-7 was very viscous and stopped up the spray gun. As a result, the company did not develop a more extensive program for using the Lucel-7.

IV. MATERIALS AND METHODS

On March 13, 1981, a NIOSH physician interviewed the two current employees who had worked as Lucel-7 spray gunners. Interviews were conducted using a standardized questionnaire which included open-ended questions about work history and both directed and open-ended questions about past medical history and neurologic symptoms. The former plant manager had also been a Lucel-7 spray gunner, and he had been interviewed during an initial telephone survey in November 1980.

V. RESULTS

The employees who had worked as spray gunners with the Lucel-7 reported using organic vapor respirators and rubber gloves during this procedure. The procedure took about 30 to 45 minutes per boat, and they generally did not make more than one boat per day. No one reported working on more than a dozen boats as a Lucel-7 foam spray gunner. The current plant manager reported once noting an episode of light- headedness while supervising and observing the foam spraying for about 30 minutes; he had not been wearing a respirator. No other symptoms were reported.

VI. DISCUSSION

The Skeeter Boats Company used only a small quantity of Lucel-7 for a relatively short time. The employees directly involved with the spray procedure were equipped with organic vapor respirators and rubber gloves. Except for one transient episode of light-headedness, they did not experience any symptoms.

NIOSH has conducted surveys of former customers for Lucel-7 and the other Lucel products. These indicate that Lucel-7 was used in much greater quantities at the plant where neurologic symptoms were reported than at any other plant. The use of protective equipment at that plant was inconsistent. These conditions of large-scale use without adequate protection may explain why severe neurologic disease developed in employees there but apparently did not occur elsewhere.

VII. RECOMMENDATIONS

Introduction of a new product should be done in accordance with the manufacturer's instructions. The "Product Bulletin" supplied by the manufacturer of Lucel-7 includes a section on "Engineering Control for Spray Applications" which states : "It is recommended that sprayers and all other personnel who enter the spray area wear supplied-air respirators during the entire period of time they remain in the spray area." The Material Safety Data Sheet recommends similar respiratory protection in the section on "Special Protection Information". The Customer Safe Handling Instructions do not include a section on spray applications, but they do recommend use of an organic vapor canister mask or self-contained breathing apparatus for clean-up of spills or leaks and the use of self-contained breathing apparatus in the event of a fire. The personnel who performed the original demonstration of the Lucel-7 spray for the Skeeter Boats Company wore organic vapor canister masks. If there are questions about the interpretation of the manufacturer's recommendations, they should be clarified prior to use of a new product.

VIII. AUTHORSHIP AND ACKNOWLEDGEMENTS

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IX. DISTRIBUTION AND AVAILABILITY

Copies of this report will be available upon request from NIOSH, Division of Technical Services, Publications Dissemination, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia 22161.

Copies of this report have been sent to:

1. Skeeter Boats Company
2. Texas State Labor Department
3. Texas State Health Department
4. OSHA, Region VI
5. NIOSH, Region VI

For the purpose of informing the "affected employees" the employer should post this report for at least 30 days in a prominent place(s) near where employees work.