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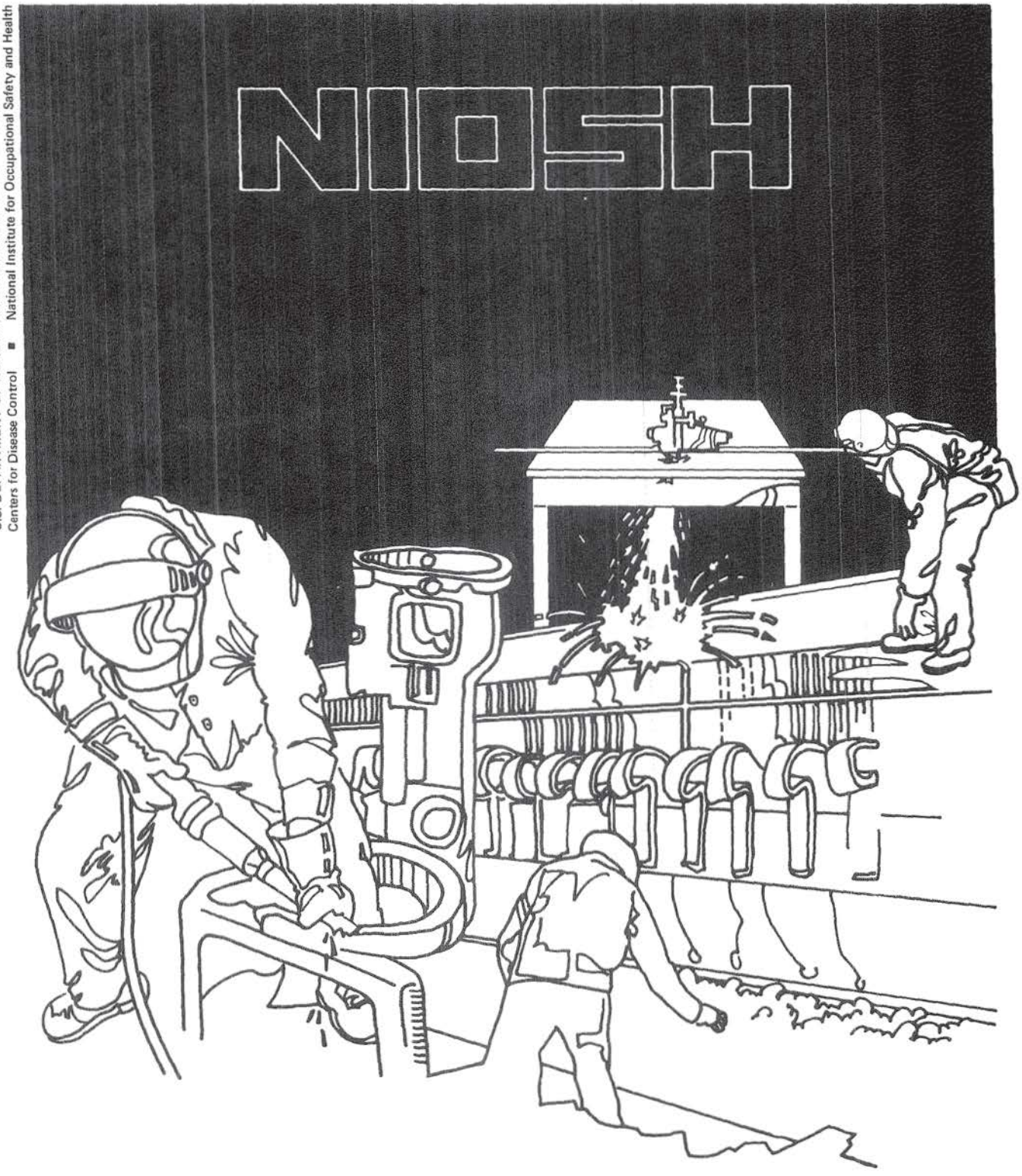

Health Hazard Evaluation Report

HETA 31-151-862
SPECTT, INC.
CLEVELAND, OHIO

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.

HETA 81-151-862
April 1981
Spectt, Inc.
Cleveland, Ohio

NIOSH INVESTIGATOR:
G. Edward Burroughs

I. SUMMARY

In February, 1981, the National Institute for Occupational Safety and Health (NIOSH) conducted an evaluation of potential health hazards associated with the use of treated lumber in the erection of a cooling tower by the Spectt Company in Cleveland, Ohio. The wood used in this structure was prefabricated and treated with an acid copper chromate solution prior to arrival on site. Since construction involving the wood portion of this structure had been completed by the time the request was received, normal evaluation techniques were not applicable. However, analyses of the wood and of work clothes for hexavalent chromium proved negative. Observations by workers and NIOSH investigators indicate probable low levels of dust and contaminants from the operations performed at this work site. Analyses of wood shavings from the lumber showed an average of 0.1% arsenic and 1.2% chromium by weight. Of thirteen employees interviewed, seven stated they had occasional eye irritation, and seven also stated that the wood seemed to irritate open cuts or that cuts caused by wood slivers seemed slower to heal. One stated that he had experienced skin irritation.

NIOSH concluded that a health hazard was not created by the use of treated lumber in this construction project. While there seemed to be some irritation of eyes and open cuts, it was not possible to ascertain if this was greater than would be expected working with untreated lumber in winter conditions.

KEYWORDS: SIC 1541 (Building construction), chromium, arsenic, acid copper chromate, treated wood.

II. INTRODUCTION AND BACKGROUND

On February 13, 1981, NIOSH received a request from management of the Spectt Company to determine if there was a health hazard associated with the erection of cooling towers utilizing pressure treated lumber. On February 15 and 16, an investigation was made of the construction site of interest in Cleveland, Ohio. The cooling tower investigated in this evaluation, typical of structures of this type, was a prefabricated unit. Lumber used in its construction is sized, shaped, drilled to fit, and then pressure treated with a material described as an "acid copper chromate" solution (trade name "Celure"). Treatment of this type typically impregnates wood with chromium and arsenic salts to make them resistant to decay in wet environments.

III. EVALUATION METHODS AND CRITERIA

NIOSH investigators found work at this location almost complete and employees were no longer working with the materials in question by the time the request was made. Therefore, normal evaluation techniques were not applicable. During the afternoon of February 15, the construction process was reviewed, procedures were discussed with employees and employer, and observations were made in and around the structure. A sample of treated wood was obtained for subsequent laboratory analysis. On the morning of February 16, employees were interviewed regarding symptoms, work history and problems specific to the use of pressure treated lumber. Tests were made to determine the presence of hexavalent chromium on gloves and clothing used to handle treated lumber. On the afternoon of February 16, a visit was made to the headquarters of the Carpenters District Council to discuss this evaluation with the union business representative.

Potential hazards in the erection of this cooling tower could be created by actions such as sawing or drilling on the treated wood. These actions could cause dust containing chromium or arsenic to become airborne. These materials could also be transfered to the workers hands and work clothing, and consequently be ingested from food and cigarettes.

Symptoms associated with exposure to arsenic include skin, nose and eye irritation and gastrointestinal disturbances. Trivalent chromium compounds have not been shown to create significant industrial exposure problems. Certain forms of hexavalent chromium have been found to cause increased respiratory cancer.

IV. RESULTS AND DISCUSSION

The thirteen employees interviewed at this site had an average of 8.7 years experience as carpenters, and an average of 4.6 months experience working with treated lumber. (This excluded one employee with seventeen years experience with treated lumber.) The only health complaints elicited were one of a current sore throat and one of a recent case of the flu. Seven of the 13 stated they had occasional eye irritation. Seven stated that the wood seemed to irritate open cuts, or that cuts caused by wood slivers seemed slower to heal. One stated that he had experienced skin irritation.

Wipe tests for hexavalent chromium inside and outside gloves of three workers and on the jacket of one worker all showed negative for this material, as did a similar test on the bulk sample of the wood. Analyses of wood shavings from the lumber showed an average of 0.1% arsenic and 1.2% chromium by weight.

As was previously noted, the wood is precut and drilled prior to delivery to the worksite. Therefore, these and similar operations which would create dust exposure to workers are kept to a minimum. Little settled dust was observed in areas where it would be expected.

No reports of evaluations of this type of operation have been reported in the literature. Measurements of total chromium, hexavalent chromium and arsenic in plants treating the wood with these materials generally revealed low levels of these materials, although one over-exposure to arsenic was found.

Since low dust levels were expected or observed, and since no hexavelent chromium was found, the conclusion is drawn that the treated lumber is not creating a health hazard in this operation. While there seemed to be some irritation of eyes and open cuts, it was not possible to ascertain if this was greater than would be expected working with untreated lumber in winter conditions.

V. AUTHORSHIP AND ACKNOWLEDGEMENTS

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VI. DISTRIBUTION AND AVAILABILITY

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

1. Spectt, Inc., Cottontown, Tennessee
2. Carpenters District Council, Cleveland, Ohio
3. NIOSH, Region V
4. OSHA, Region V

VII. REFERENCES

1. Patty,F.A.,(ED), Industrial Hygiene and Toxicology, Vol. II, Second Revised Edition, 1963.

2. Criteria for a Recommended Standard, Occupational Exposure to Chromium (VI), HEW Publication No. (NIOSH) 76-129.

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