Site Visit Report
Outboard Marine Corporation
100 Seahorse Drive
Waukegan, Illinois 60085

Date of Visit: March 18, 1978

NIOSH Personnel (alphabetical order):

John Fajen, Industrial Hygienist
Robert N. Ligo, M.D., Chief, Medical Section, IWSB
Alexander Blair Smith, M.D., Medical Officer, IWSB
Raymond R. Suskind, Director, Department of Environmental Health, University of Cincinnati College of Medicine, Consultant to NIOSH

Persons Contacted (alphabetical order):

Outboard Marine

Richard Kissel, Attorney
Carl Ruesch, Vice-President and Division Manager
Hugh Thomas, Attorney

Independent Marine and Machinists Association

Ken McDonald, President
Walter Sheets, Vice-President

Project Officer and Author of this Report:

Alexander Blair Smith, M.D.
Medical Officer, Medical Section, IWSB, DSHEFS, NIOSH

On March 16, 1978, Drs. R.N. Ligo, and A.B. Smith, and Mr. John Fajen, Industry-wide Studies Branch, DSHEFS and Dr. Raymond Suskind, Director, Department of Environmental Health, University of Cincinnati School of Medicine; traveled to Waukegan, Illinois, to gather information relative to alleged occupational exposure to polychlorinated biphenyls at the Outboard Marine Corporation. The above-named individuals met with Mr. Hugh Thomas, attorney for the Outboard Marine Corporation; Mr. Richard Kissel, attorney for Outboard Marine; Mr. Carl Ruesch, Vice-President and Division Manager, Outboard Marine; Mr. Ken McDonald, President, Independent Marine and Machinists Association, worker bargaining unit; and Mr. Walter Sheets, Vice-President, Independent Marine and Machinists Association. This visit originally had been planned for July, 1977. Due to difficulties in arranging a mutually convenient time for the company, NIOSH, and Dr. Suskind, our consultant; and due to intervening labor negotiations and a strike; the visit was not made until March 16, 1978.

NIOSH first became aware of possible problems at this facility in May, 1977, when Dr. Suskind, who was aware of NIOSH's on-going survey of workers occupationally exposed to PCBs, described to us the nature of the problem at this facility, as it had been explained to him by other persons. In early 1976, the Environmental Protection Agency had traced the presumed source of PCB contamination of Waukegan Harbor to discharges from the Outboard Marine Plant. It became apparent that leakage from an aluminum die-casting operation, which utilized a PCB fluid in its hydraulic system, had been discharged directly into the harbor for many years. Our impression was that there had occurred significant occupational exposure to PCBs from leaks in the hydraulic system. There appeared to be a strong likelihood that this plant might be an appropriate site for an epidemiological investigation of occupational exposure to PCBs. Therefore, contacts were made with the company, to arrange for a visit to investigate this possibility.

Prior to this visit, N.I.O.S.H. consulted with the Aurora, Illinois, office of the Occupational Safety and Health Administration. The OSHA representative in that office sought out their file on Outboard Marine, and informed NIOSH that they had records of three inspections: in July, 1973, for a safety inspection; in April, 1975, for "hygiene"; and in June, 1976, for safety. No mention was made of PCBs in the OSHA files. Mention was made of noise problems, and of nuisance dust.

The meeting held on March 16, 1978, started with our describing NIOSH's proposed epidemiologic study, and expressing our desire to learn more about the Outboard Marine Corporation's occupational/environmental situation, to investigate the appropriateness of undertaking such a study at that plant. Mr. Hugh Thomas then described the past history of Outboard Marine's problem of PCB exposure, as it had unfolded. We were told that in February, 1976, Outboard Marine had been approached by the Illinois and U.S. Environmental Protection Agencies, who had traced PCB contamination of Waukegan Harbor to the Outboard Marine Corporation plant. Within two to three months time, Outboard Marine Corporation had determined that this contamination was traceable to fluid in its hydraulic system, used in the aluminum die-casting operation. The aluminum die-casting equipment requires high pressure hydraulics, and leaks and spills of fluid are a routine part of such an operation. Each die-casting machine (there were approximately 128 of them) was surrounded by a trench and by sawdust to absorb any spillage, and a drainage system to contain any runoff. The runoff was put through oil interceptors, and the filtered effluent discharged into the harbor. Mr. Thomas said that the company had thought, prior to 1976, that such a system was adequate to intercept any oil being discharged in the effluent from the hydraulic system. Mr. Thomas told us that, following a search of the company's records, it had been determined that purchase of the hydraulic fluid began from Monsanto in 1947 or 1948. The fluid was sold under

the tradename Pydraul F-9 and A-200. In 1971 Monsanto ceased to sell those formulations, and begin to sell them a new fluid, Pydraul 50-E. It was not until 1976 that the company learned that the original fluids were said to have contained an average of 60% Aroclor 1248.

According to Mr. Thomas, in 1971 or 1972 the company decided to move its die-casting operation to a new part of the building in which it was then housed. This move was not related to any knowledge of a problem from the hydraulic fluid; it was dictated solely by economic/manufacturing considerations. At the time they were informed of their PCB hydraulic fluid problem, all die-casting machines, except for seven or eight, had been moved. In moving the machines to the new facility, the hydraulic system had been flushed and cleaned. Some of the fluid was thrown away, and some reinfused into the machines after they had been moved. Mr. Thomas estimated that, with routine loss of hydraulic fluid and replacement with the new hydraulic fluid since 1971, the PCB content in the current hydraulic fluid, as of a year ago, was no more than 0.0005%, a level which, by current EPA disposal regulations, would not require special disposal.

Mr. Thomas claimed that at the present time there is no direct discharge to the environment from the new aluminum die-casting operation. The old die-casting plant has been cleaned by abrasive blasting, a new floor installed, drainage pipes sealed, and a new storm drainage system installed. The old plant is now used for shipping and storage.

Under normal operating conditions in the new aluminum die-casting facility, Mr. Thomas claimed that the operator does not come into direct contact with hydraulic fluid. The major routes of occupational and environmental contamination would be through leakage and spillage of the hydraulic fluid. Mr. Thomas claimed that the hydraulic fluid did not become aerosolized. It was pointed out, however, that water soluble material is sprayed onto the cast aluminum, to

release it from the die. It was our impression that this die-release fluid comes in contact with hydraulic fluid, and it is to this die-release fluid that the operator has the most exposure. The new plant ventilation system provides 28 changes per hour in the die-casting department, and the air is not recirculated.

Mr. Carl Ruesch described the physical characteristics of the facility. Outboard Marine has three plants located on 100 acres of land jutting into Waukegan Harbor. Plant #1 has approximately 1000 factory and office employees, and primarily assembles equipment. Plant #2 has approximately 3150 employees, and contains the aluminum die-casting operation in question. Plant #3 contains approximately 150 employees, and is devoted to a training and service school. The personnel turnover rate at the plant is said to be low. The die-casting operator job is an entry position.

The plant has a full time physician, Dr. Philip Foley. Nurses are available on all three shifts. Pre-employment examinations are required, but periodic examinations are not. We were informed that the plant has some medical records going back approximately ten years.

Mr. McDonald and Mr. Sheets, the Union Representatives, expressed their concern that employees may become alarmed by our investigation of PCBs, in view or previous adverse publicity in the press relative to PCB contamination of Waukegan Harbor.

Following our meeting, we were conducted on a walk-through tour. Mr. John Fajen obtained some wipe samples of environmental contamination from machine surfaces; and bulk samples from leakage from the hydraulic system. These samples were analyzed by the Utah Biomedical Test Laboratory for PCBs quantitated as Aroclor 1248. All samples demonstrated PCBs not to be present above the level of detection for the method. A copy of that report accompanies this trip report as an attachment.

Due to considerations of time, few questions were raised regarding apparent health problems among employees at the plant. Records of complaints of illnesses were not reviewed. There was little opportunity to discuss Outboard Marine's medical program, except the kinds of facilities and personnel now engaged. The results of worker examinations since 1976, of the die-casting operations and service people working in the die-casting areas, were not discussed.

The Outboard Marine Corporation plant in Waukegan has been at the same geographic location since at least the late 1930s. Assuming that PCBs were introduced into the die-casting machinery in the late 1940s, a good-sized population exposed to some level of PCBs for as long as 25 years might be found there, along with a suitable, non-exposed population (refer to Mr. Ruesch's description of the three plant buildings). However, documentation of previous exposures would be entirely inferential, based upon an examination of sampling data that may be available from Outboard Marine itself.

A review of N.I.O.S.H. project plans for the next fiscal year dictates that, at the present time, further data collection on the PCB epidemiological study be curtailed and that current efforts be devoted to analysis of present and available information. Therefore, it is recommended not to pursue further site selection for this epidemiological study. This decision would thus have the operational effect of a recommendation for no further investigations of the feasibility of an epidemiological study at this site at this time.

Utah Biomedical Test Laboratory

520 Wakara Way
Salt Lake City, Utah 84108
Phone 801 581-8267

April 27, 1978

MEMORANDUM

TO: John Fajen

FROM: Steven L. Hudson

SUBJECT: UBTL Analytical Laboratory Report for: PCB's as AROCLOR 1248

XXXXXX #: PCB

SEQUENCE #: 1337

Results of Analysis of 15 sample(s) 15 analyses

Comprising Lab No(s): 78 1722 to 1736

A quantity of each bulk sample was weighed and dissolved in Benzene. The wipe samples were extracted with 3 ml of Benzene. Samples were analyzed by gas chromatography using an electron-capture detector and an automatic liquid sampler for injections. A 6 foot OV-101 glass column was used at 250°C on a Hewlett-Packard 5730 gas chromatograph.

One other significant unknown peak was observed in the analysis of both the bulk samples and the wipe samples.

The lower limit of detection for the wipe samples was found to be 0.6 micrograms of (Aroclor 1248) PCB's per sample.

The lower limit of detection for the bulk samples was found to be 0.001% by weight of (Aroclor 1248) PCB's.

Steven L. Hudson

James H. Nelson, Ph.D.

cc: Charles L. Geraci, Ph.D.

SAMPLE DATA AND LABORATORY REPORT FOR HETAB
INDUSTRIAL HYGIENE SAMPLES

Date 3/17/78

XXXXXXXX# PCB

Sequence # 1337

Analysis By:

MSS _____

UBTL X

Name of Plant Johnson Outboard Marine Corporation **Address** Waukegan, Illinois

Analyze for AS PER REQUESTED (See Below) **Collected by** John M. Fajen **Date Collected** 3/16/78

Send Report To John Fajen, DSHEFS, NIOSH, Robert A. Taft Laboratories, 4676 Columbia Parkway, Cincinnati, Ohio 45226

Laboratory Number*	Field Number	Type of Sample	Sample Volume		percent by weight PCBs as AROCLOR 1248
78 1722	JB 1	BULK			<0.001 %
78 1723	JB 2				<0.001 %
78 1724	JB 3				<0.001 %
78 1725	JB 4				<0.001 %
78 1726	JB 5				<0.001 %
78 1727	JB 6				<0.001 %
78 1728	JB 7				<0.001 %
78 1729	JB 8				<0.001 %
					total micrograms
78 1730	JW 1	WIPE			<0.6 µg
78 1731	JW 2				<0.6 µg
78 1732	JW 3				<0.6 µg

Remarks: (Interfering materials possibly present, purpose of samples, unusual circumstances, laboratory comments, etc.)

Use back for additional space. _____

*To be filled out by laboratory. Please submit two copies of form with samples. One copy will be returned with results.

Date Received* 3/27/78 **Date Reported*** APR 27 1978 **Analyst*** _____

James B. Pendergrass
Chief, Laboratory Services

SAMPLE DATA AND LABORATORY REPORT FOR METAB INDUSTRIAL HYGIENE SAMPLES

Date 3/17/78

~~MMRXIAX~~# PCB

Sequence # 1337

Analysis By:

MSS

UBTL X

Name of Plant Johnson Outboard Marine Corporation Address Waukegan, Illinois

Analyze for AS PER REQUESTED (See Below) Collected by John M. Fajen Date Collected 3/16/78

Send Report To John Fajen, DSHEFS/NIOSH, Robert A. Taft Laboratories, 4676 Columbia Parkway, Cincinnati, Ohio 45226

Laboratory Number*	Field Number	Type of Sample	Sample Volume		total micrograms PCB's as AROCLOR 1248
78 1733	JW 4	WIPE			<0.6 µg
78 1734	JW 5	"			<0.6 µg
78 1735	JW 6	"			<0.6 µg
73 1736	JW 7	"			<0.6 µg
				Limits of detection: Bulks = 0.001 %	
				Wipes = 0.6 µg	

Remarks: (Interfering materials possibly present, purpose of samples, unusual circumstances, laboratory comments, etc.)

Use back for additional space.

*To be filled out by laboratory. Please submit two copies of form with samples. One copy will be returned with results.

Date Received* 3/27/78 Date Reported* APR 27 1978 Analyst* Steven J. Kuba

Chief, Laboratory Services