IN THE MATTER OF:

Tennessee Gas Pipeline Company
vs.
Monsanto Company

Cause No. 94-C190145

Deposition of Richard Davis
November 28, 1995

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COMMONWEALTH OF KENTUCKY

ROWAN CIRCUIT COURT

CIVIL BRANCH

TENNESSEE GAS PIPELINE COMPANY,

Plaintiff,

vs. NO. 94-C190145

MONSANTO COMPANY,

Defendant.

Deposition of RICHARD J. DAVIS, taken on behalf of the Plaintiff, at the offices of Gore & Perry Reporting Company, 100 North Broadway, in the City of St. Louis, State of Missouri, on the 28th day of November 1995 before Nancy Prange, Registered Professional Reporter and Notary Public.

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APPEARANCES OF COUNSEL:

FOR THE PLAINTIFF:

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INDEX

EXHIBITS

RICHARD J. DAVIS,

of lawful age, having been first duly sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, deposes and says in reply to oral interrogatories propounded as follows, to-wit:

EXAMINATION

QUESTIONS BY MR. ROEDER:

Q: Could you state your name for the record, sir?

A: Richard J. Davis.

Q: Where do you live, Mr. Davis?

A: You mean specific address?

Q: Yes.

A: 120 West Swon, S-w-o-n, Avenue, St. Louis, Missouri 63119.

Q: What do you do for a living?

A: I'm a chiropractic physician.

Q: Have you ever been deposed before, sir?

A: Yes.

Q: When have you given your deposition or testified?

A: In the early 1980's there was a deposition.

Q: What was that case involving, sir?

A: It was Monsanto and I believe it was

Outboard Marine Company.

Q: Okay. Where did you give that deposition?

A: It was in St. Louis but I can't be more specific. I don't remember where.

MR. ROEDER: I will state for the record my paralegal was unable to find the deposition transcript of Mr. Davis. I understood those were being produced.

MR. PECK: I will check at a break but I have not seen that.

MR. ROEDER: Okay.

Q: Have you testified in any other case other than the Outboard Marine, Monsanto case?

A: No, excluding divorce deposition kind of things.

Q: I won't ask you about any deposition testimony you've given in any divorce.

Have you ever testified at trial?

A: No.

Q: Are you being represented here today?

A: Yes.

Q: Who is representing you?

A: Timothy Peck.

Q: From the Smith Helms firm from North Carolina?

A: Yes.

Q: Did you request that Mr. Peck represent you today?

A: I don't know how to answer that. I wanted him to and -- I guess the best answer is "yes".

Q: Did you request Monsanto get you counsel for this deposition?

A: Not specifically. It evolved and --

Q: And they offered?

A: Yes.

Q: Okay. So you're not going to pay Mr. Peck's attorneys' fees for representing you here today?

A: That's correct.

Q: Your understanding is that Monsanto will?

A: It's between them, I assume.

Q: All right. Did you prepare for your deposition today, sir?

A: Yes.

Q: How did you prepare for your deposition?

A: I met with Mr. Peck yesterday and, just to refresh memory of some 30 years ago, reviewed a few documents.

Q: Did you meet with Mr. Peck in the offices of Husch and Eppenberger?

A: No.

Q: At the offices of Monsanto?

A: Yes.

Q: In St. Louis?

A: Yes.

Q: Who was present when you met with Mr. Peck?

A: Obviously Mr. Peck and me and for part of it Rolly --

Q: Rolly Chambers?

A: Chambers, that is correct.

Q: Also from Mr. Peck's firm?

A: Yes.

Q: How long did the meeting last?

MR. PECK: I object as to the specifics of the meeting. He's indicated that he met with counsel in preparation for the deposition and I'll instruct you not to answer any further specifics on the grounds of privilege.

MR. ROEDER: So the question put to the witness is how long the meeting lasted and you're instructing the witness not to answer that on the basis of privilege?

MR. PECK: Yes. As to whether it was five minutes or two weeks I don't think it's information that's necessary.

MR. ROEDER: Well, the standards are

different than that, sir. The privilege, as you know, is a very narrow privilege and it relates to advice given or communications, not to how long the meeting lasted.

Q: Your attorney has instructed you not to answer the question. Are you going to accept his instruction?

A: Yes.

MR. PECK: I would add to that objection work product privilege, as well.

MR. ROEDER: Well, you can stand on your objection, sir. I have never seen an objection sustained as to how long somebody met in preparation for testimony.

Q: Okay. Did you look at documents in preparation for your testimony?

A: Yes.

Q: A series of documents that have been identified prior to your deposition?

MR. PECK: I'll state here that the witness was provided with the documents which you've identified, Steve, as documents that you intended to use for this deposition.

Q: To the best of your knowledge is what your counsel represented correct?

A: Yes.

Q: Did you meet with anyone prior to yesterday in preparation for your testimony?

A: No, I didn't.

Q: Did you discuss your testimony yesterday with anyone other than Mr. Peck and Mr. Chambers?

A: No, I did not.

Q: Can I have a little bit, sir, some information concerning your educational background?

A: Yes.

Q: After high school, sir, where did you go to school and what concentrations did you follow?

A: I went to Worcester Polytechnic Institute. I graduated with a bachelor of science degree in chemical engineering.

Q: For the court reporter that's W-o-r-c-e-s-t-e-r?

A: That's correct.

Q: In Worcester, Massachusetts?

A: That's correct.

Q: And you graduated with your bachelor's in chemical engineering in what year?

A: 1951.

Q: Did you subsequently take any additional schooling or education?

A: Yes, I graduated as a chiropractic physician in August of 1994 from Logan College of Chiropractic.

Q: Where is that located, sir?

A: Chesterfield, St. Louis area, Missouri.

Q: And you've been in, did you pass any board certification or state licensing procedure in connection --

A: Both. Passed national board examinations and state licensing examinations.

Q: So you are, under the law of Missouri as you understand it you're a physician?

A: That word -- yes. The word physician is looked at differently but, yes, I'm a chiropractic physician. The simple answer is "yes".

Q: You can write prescriptions for medicine?

A: No, that's a medical physician. I'm a chiropractic physician.

Q: But you can -- well, tell me how you're, as quick and succinctly for someone such as me, how a chiropractic physician differs from a medical physician?

A: We're both, medical and chiropractic physicians, are licensed to be a primary care physician. That is a patient can come in off the

street and see either one of us first for diagnosis and treatment. The difference, and the training is very similar and all the basic sciences of the human body, the training differs in treatment techniques. Medical doctors use prescription drugs that are licensed to do that. Chiropractic physicians use other techniques, manual techniques and are licensed to do that. So we're both physicians, we can both be primary care that a patient can come off the street to us, we can both diagnose and we treat differently and refer back and forth.

Does that answer your question?

Q: I think so. And you are board certified by a national institute or governing body?

A: Yes.

Q: What is that institute or governing body?

A: National Board of Chiropractic and there may be one more name to that.

Q: How long was the study, sir, to obtain your degree from Logan College of Chiropractic?

A: About four calendar years. It's five academic years.

Q: Just because you go year round?

A: Yes.

Q: Can you, sir, discuss your work history

after Worcester Polytechnic?

A: I joined Monsanto in 1951. Stayed with Monsanto until 1985 and retired.

Q: Well, let me see if I can break that down. In '51 when you joined Monsanto what was your assignment or what was your responsibility?

A: I was at one of the manufacturing plants, the W. G. Krummrich Plant, in Monsanto, Illinois in which I did laboratory analysis, process improvement engineering and some manufacturing supervision.

Q: Your title was?

A: There were several titles but plant technical services engineer was the primary one.

Q: Is it fair to say it was an entry level position in the technical side?

A: Yes.

Q: How long did you hold that position at the Krummrich Plant?

(Discussion off the record)

Q: In '51 when you joined Monsanto the Krummrich plant was in what was known as Monsanto, Illinois but now is known as Sauget, Illinois?

A: That's correct.

Q: How long were you at that plant?

A: Five years.

Q: So until approximately 1956?

A: Correct.

Q: How did your responsibility change at that time?

A: I went from plant technical services into marketing technical services.

Q: And what did that mean to you on a day-to-day basis?

A: Instead of, instead of involving the manufacturing of various chemicals I was involved in helping customers use certain products.

Q: Were you support for the sales force?

A: That's correct.

Q: So would you go out to customers and find out how they're using the product and attempt to determine a way that one of Monsanto's products could, for example, help them with respect to a particular need?

A: More if a customer had a problem or a technical question I would go discuss it with the customer and try and find some resolution, some solution to the problem.

Q: For some reason whatever the product was wasn't working as they hoped and you're trying to refine the product and figure out why it wasn't

working?

A: Or it may be they were just starting to use it. It didn't have to be a bad problem.

Q: Explain how it worked, what precautions needed to be taken, make sure that it worked?

A: Yes.

Q: What products did you provide marketing technical services for?

A: Pydraul products. Those that existed at that time.

Q: What Pydraul products did exist at that time?

A: Pydraul F-9, Pydraul 6.5 and I believe, but I'm not certain, Pydraul 150.

Q: This is in the late 50's?

A: Yes.

Q: How long did you continue in your position as a marketing technical services person at Monsanto?

A: About two years.

Q: So 1958 approximately?

A: Yes.

Q: How did your duties and responsibilities change at that point?

A: I then became responsible for the sales of

Pydraul products.

Q: You went on the sales side?

A: No, marketing would be a more accurate word.

Q: So instead of technical services you're now in the marketing part?

A: That's correct.

Q: I'm seeing a distinction, sir, tell me if I'm correct, between marketing and sales at Monsanto at that time, is that correct? There were sales people and there were marketing people?

A: There were sales people in the field with customer responsibility and there were marketing people in the home office with product responsibility.

Q: You were a marketing person with product responsibility?

A: Yes.

Q: Did you continue in the Pydraul area from 1958?

A: Yes, I did.

Q: Okay. What was your title in 1958 or at least describe your job description more fully if you could?

A: It was, it was one of planning and support to field sales to see that the proper marketing of

the Pydraul products.

Q: Involving the development of Pydraul products?

A: No, I was in communication but not responsible for development.

Q: And how long did you hold this second position in the Pydraul area, from 1958 to when?

A: The position and responsibilities grew somewhat but I remained involved with marketing and supervision of Pydraul for about ten years, about 1968ish.

Q: And how did your duties and responsibilities change at that point?

A: In the mid 60's I had some additional responsibilities for other fluids other than Pydraul.

Q: Which fluids were these?

A: The one I remember is Therminol transfer fluids. Those were the primary ones.

Q: Now, the Pydrauls and Therminols that we're discussing up to this point in time that you dealt with at Monsanto contained PCB's, did they not?

A: The Pydrauls did. The early Therminols did and others did not and I can't cite a date when they did not occur.

Q: And we're saying PCB's, polychlorinated biphenyls that's what you understand that term to mean, correct?

A: Yes.

Q: So you're still in the marketing area in the mid 60's when you assumed additional responsibilities with respect to Therminol and perhaps some other fluids you can't recall now, is that correct?

A: Yes.

Q: How long did you continue in that capacity? Is this up until '68?

A: Yes.

Q: How did your job responsibilities change at that point?

A: As I recall I then gave up responsibility for the marketing of the fluids and took on responsibility for commercial development, the development of new products or new businesses.

Q: Now, are we still talking about the same fluids, the Pydrauls and Therminols?

A: I was interested more then in, in building systems, businesses around the transfer fluids. So it was indirectly related to fluids but had more to do with acquisition studies and things of that

nature.

Q: You were doing acquisition studies, did this involve potential acquisitions of businesses?

A: Correct.

Q: Were you still in the functional fluids group?

A: Yes. And the name of group has changed so many times I don't know functional fluids is correct.

Q: Specialty products? It was in the organic chemicals division, correct?

A: That, too, changed but I think your original statement is the closest, functional fluids or specialty products.

Q: Okay. So from '68 to, at that point if I understand your testimony you were involved in the development and potential acquisition of additional business systems or fluid systems?

A: Equipment that might relate to our fluids.

Q: What type of equipment would this involve?

A: Primarily fired heaters.

Q: Did any of the equipment you looked at involve air compressors?

A: No.

Q: How long did you continue in this capacity?

A: About four or five years.

Q: So from '68ish was your testimony until '72, '73?

A: '73, '74 might be more likely.

Q: Do you recall what your title was from '68 until '73 or '74?

A: It would be something like commercial development manager, functional fluids or specialty products.

Q: Did you have people who reported to you?

A: Yes, I did.

Q: How many people did report to you, sir?

A: Perhaps three.

Q: Who were those people or are those people?

A: Wilson Overall is one. It's hard to remember exactly who did what when. There was a Rolly Garcia who reported to me but that was not in the development capacity. For a short time there was a Robert Bebacqua.

Q: B-e-b-a-c-q-u-a-, I think?

A: Yes.

Q: And how did, what were Mr. Garcia's and Mr. Bebacqua's duties?

A: Mr. Bebacqua was involved in the aviation industry and seeking new commercial opportunities in

that area.

Q: How about Mr. Garcia?

A: Mr. Garcia was involved with Pydrual fluids so having said that it's got to be an earlier date because he did not report to me when I was involved with commercial development.

Q: While you were, you had the responsibilities up until '68 did people report to you in that capacity, as well?

A: Early on there was a Dale Smith who reported to me, yes.

Q: And what, what was Mr. Smith's function or duty?

A: Pydraul technical services.

Q: Was there anyone later on?

A: Related to Pydraul?

Q: In any capacity?

A: In the heat transfer fluid area there were two people that reported to me.

Q: They were?

A: Stan Shaw and Don Rausch.

Q: How about in the Pydraul area, anyone other than Mr. Smith?

A: I don't recall anyone.

Q: So from '74 on, sir, did your duties and

responsibilities at Monsanto change?

A: Yes.

Q: How did they change?

A: I was no longer related to the fluids program but to the food ingredients program.

Q: Was your transfer to the food ingredients program related to a decline in the fluid sales?

A: No.

Q: Did you request to be transferred to the food ingredients?

A: I frankly don't remember that transition. It was a growth opportunity for me but I don't remember exactly what triggered it. I seem to remember reorganization being involved.

Q: Is it fair to say you use the food ingredients program as having additional business opportunities that weren't available in the fluids program?

A: I don't remember that being my feeling, no.

Q: Do you recall why you moved?

A: Do I recall why I moved?

Q: Yes.

A: Well, as I stated, I don't really recall. I seem to remember a reorganization in the company at that time, an opportunity for me specifically in the

development of a new major product for Monsanto.

Q: What product was that, sir?

A: It was sorbates which are food preservatives. And Aspartame which later became NeutraSweet.

Q: And how long, what was your title or at least the job responsibilities if you can't recall the specific title?

A: It was commercial development manager for food ingredients.

Q: Same basic responsibility that you had in the fluids area you just now applied to the food ingredients area?

A: With the exception that the food ingredients area was larger and I reported to a commercial developer manager or commercial development director, I guess.

Q: So you would look at potential acquisitions related to the development of these?

A: No, here I was looking more specifically at bringing a new chemical into the marketplace, a new to Monsanto chemical into the marketplace.

Q: So did the technical people report to you?

A: No one reported to me at that time.

Q: How long did you continue in this job?

A: I remained in food ingredients until my retirement in 1985 but my responsibilities probably halfway through that period changed to marketing responsibility. From development responsibilities to marketing responsibilities.

Q: So from approximately '79 or '80 you went to the marketing side again?

A: Yes.

Q: And you were providing support to, you had product responsibility?

A: I had product responsibility.

Q: For these same products, Sorbates and Aspartame?

A: And additional ones. Not Aspartame any longer. Sorbates and other products.

Q: And you continued in this capacity until '85?

A: Yes.

Q: And at that point when you retired did you do any consulting work for Monsanto?

A: After I retired?

Q: Right.

A: I became a consultant and Monsanto was one of my clients.

Q: What type of consulting business did you do,

sir, what areas?

A: I consulted to a variety of companies to help them evaluate whether or not they should enter certain markets with their products or how to enter the market with their products.

Q: Did you consult with Monsanto in that capacity?

A: I consulted with Monsanto on the development of a new market for an existing product so the answer is "yes".

Q: How long did you consult, your consulting relationship with Monsanto exist?

A: Less than one year.

Q: Did this immediately follow your retirement?

A: No, it did not.

Q: Do you continue to consult?

A: Do I continue to consult?

Q: Yes.

A: No.

Q: You closed up the consulting business?

A: Yes.

Q: Did the business operate under a name or a corporation?

A: Yes. It was not a corporation but it did operate under a name, CMA, which was Creative

Marketing Associates.

Q: Did you have any partners in the business?

A: No, I did not.

Q: So you operated as a sole proprietorship?

A: Correct.

Q: Did you cease -- when did it cease operating?

A: When I started school for chiropractic.

Q: Approximately 1990 when you went back to medical school?

A: Chiropractic school.

Q: Chiropractic school?

A: Yes.

Q: And you have been in private practice as a chiropractic physician since August of '94?

A: I have been licensed since August of '94. I began practice in December of '94. So about a year.

Q: And you have an office in St. Louis?

A: Yes, I do.

Q: Sir, I would like to go back. Do you draw a pension from Monsanto?

A: Yes.

Q: Are you being compensated for your time here today?

A: No.

Q: Have you requested that Monsanto compensate you?

A: I did not request it.

Q: The Pydrauls that we have discussed, I think when you first went into the marketing technical services area they were Pydraul F-9, Pydraul 6.5 and Pydraul 150, do you recall that testimony?

A: Yes.

Q: Did the products available in the Pydraul line change over time?

A: Yes.

Q: While you had responsibility in that area?

A: Yes.

Q: Okay. What additional products were added or changed in that line?

A: Pydraul A-200 was added.

Q: And what was that primarily used for?

A: Hydraulic equipment such as die casting machines. Pydraul AC was added. It's an air compressor lubricant.

Q: Do you know when that was added, sir?

A: I don't actually know. I would guess it to be around 1960. That's approximately.

Q: Any others?

A: I am thinking of a Pydraul 312 and similar formulations were added but I can't put a date on it. I think I was no longer responsible for the marketing of Pydraul when that occurred.

Q: Do you recall what functions or uses those products were designed for?

A: They were all hydraulic fluid.

MR. ROEDER: We're going to start with Exhibit 375.

(Plaintiff's Deposition Exhibit Number 375 was marked for identification)

Q: Sir, Exhibit 375 is memorandum dated August 21, 1956 and you're a carbon copy recipient as shown on the right-hand corner, correct?

A: Yes.

Q: Would this have been at the time you were at Krummrich or at this point had you transferred your location?

A: I had transferred my location.

Q: The reference is the Roberts Building, where was that, sir?

A: In downtown St. Louis.

Q: So you were in the general offices at that point?

A: Yes.

Q: So you're now in the marketing technical services at this point?

A: Yes.

Q: Is this a document you reviewed in preparation for your testimony today?

A: Yes, it was.

Q: It's from R. Emmet Kelly, M.D. and you recognize that name, don't you, sir?

A: Yes.

Q: He was a doctor at Monsanto?

A: Yes.

Q: In charge of the medical department?

A: That's correct.

Q: G. R. Sido, S-i-d-o, who was he, sir?

A: I remember him only at that time as someone representing us in our Washington office related to government things.

Q: You would have received this document in the ordinary course of business at Monsanto, is that correct?

A: Yes.

Q: And the routing -- strike that.

The carbon copy recipients on the right-hand corner would have all received different copies of the same document in the ordinary course?

A: Would you repeat that?

Q: Sure. The people listed on the right-hand side, they all would receive copies of this document in the ordinary course, correct, that was the practice of Monsanto?

A: Well, Dr. Kelly decided to include these people in this memo apparently but I don't understand the question do all these people -- are you saying all of these people get all of the correspondence related to the product?

Q: No, it was directed to this document. It was the practice at Monsanto if you put carbon copy, a list of carbon copy recipients on the top right-hand corner they would all get a copy of the document?

A: Yes.

Q: It wasn't a trick question.

A: It was an unusual question.

Q: The memorandum references the Kettering Laboratory, are you familiar with that institution?

A: I remember the name Kettering Laboratory.

Q: What type of laboratory was it, sir?

A: I remember them as a testing laboratory that Monsanto's medical department used for a number of tests but I have no detail. I never visited them or

read their reports.

Q: All right. The, the, the discussion or the memorandum indicates that Dr. Kelly had talked to a doctor at the Kettering Laboratory and he gave Kelly information with respect to micrograms of Aroclor per liter, I'm paraphrasing. What I'm interested in, the statement that Dr. Kelly says "This amount increases to 0.2 and 0.3 part per million of Aroclor. This would give a figure for Pydraul of .8 to 1.3 parts per million or roughly 5 to 10 times higher than the Navy found." Do you see that, sir?

A: Yes, I do.

Q: How would the estimates in parts per million be done as you understood it at Monsanto at this time or at the Kettering Laboratory?

A: I can answer from my technical background but I have no knowledge.

Q: Sure. That's what I'm interested in.

A: How are parts per million determined in this kind of test?

Q: Right.

A: They somehow and in this case they specifically state bubbled air through a fluid and then analyze what's in the vapor space above the fluid.

Q: When it's bubbled through the fluid how would they analyze what's in the vapor space above the fluid?

A: I don't know how they analyze that.

Q: But at least it's your understanding that there was a mechanism available as of the date of this memorandum in 1956 that would allow them to measure parts per million using the method you described?

A: Well, the method I described is one that's just a general standard approach and the fact that they could measure parts per million is stated in the memo so I guess I have to conclude it was possible.

Q: Okay.

(Plaintiff's Deposition Exhibit Number 376 was marked for identification)

Q: I'm showing you what's been marked as Plaintiff's Exhibit 376. It's a memorandum from you dated March 21, 1957. The production number is TNGS 017938 and I didn't record the production number for the record of the previous exhibit. Plaintiff's 375 is TNGS 017878.

Exhibit 376, sir, is an exhibit that, memorandum that you had written while at Monsanto,

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correct?

A: It appears to be, yes.

Q: And your memorandum, which is Plaintiff's Exhibit 376, references the Sloan Kettering laboratories toward the bottom of the second to the last paragraph, correct?

A: Would you allow me a moment to take a look at it?

Q: Sure, take as much time as you wish.

A: Okay. I've read it. What is your question?

MR. ROEDER: Would you read it back, Miss Court Reporter?

(The reporter read the record as requested)

A: Yes.

Q: That's the same laboratory that's referenced in the previous exhibit, isn't it?

A: Yes.

Q: Your memorandum in 1957 to a Jake Arbogast references a wire that you had received regarding the Bucyrus Erie Company?

A: Yes.

Q: And in that memorandum you wrote to Mr. Arbogast or quoted from that wire which said "I have had numerous hose and piping failures which have

resulted in Pydraul being sprayed over our workmen and in a number of cases workmen's eyes have been seriously burned. Our medical staff at a loss as to how to properly treat these burns as do not know Pydraul analysis." That would be a communication you received from the Bucyrus Erie Company?

A: It appears to be.

Q: This was a phenomenon that you were aware of, sir, at Monsanto that if a hydraulic hose would fail Pydraul could be sprayed out?

A: If Pydraul were in the machine. Hydraulic hoses fail, break, get old, whatever is in the system it comes out, yeah.

Q: Now, the Pydraul 150, this is one of the original Pydrauls you testified was in the line when you started in that area, correct?

A: I think I said I thought it was. From these documents it appears about that time it was, yes.

Q: Did the Pydraul 150 contain PCB's?

A: Yes, it did.

Q: Is Exhibit 376 one of the documents you looked at in preparation for your testimony today?

A: Yes, it is.

(Plaintiff's Deposition Exhibit Number 377 was marked for identification)

Q: Exhibit 377 for the record is a, looks like a printing of a wire to you from A. W. Hempelmann, is that what it is, a wire?

A: It looks like a wire.

Q: Production number TNGS 18515 dated 12/15/58 and this references Pydraul AC, does it not? Do you see that in the second line?

A: Yes.

Q: As of December of 1958 Pydraul AC was being marketed and produced by Monsanto, is that correct?

A: That's correct.

Q: And it, the fax or wire to you states "Is it reasonable to assume that Pydraul vapor is present in some degree throughout our compressed air piping system. Please advise if this vapor is toxic or harmful in any way when used by persons for breathing in air line type respirators", do you see that?

A: Yes.

MR. PECK: Let me just state a technical objection. I don't think you read it exactly.

MR. ROEDER: Let me read it again.

MR. PECK: The document speaks for itself.

Q: The wire to you states, does it not sir, "Have letter from Crown Zellerbach Lebanon Oregon

dated December 10 who are using Pydraul AC in air compressors which we quote in part quote is it reasonable to assume that Pydraul vapor is present in some degree throughout our compressed air piping system. Please advise if this vapor is toxic or harmful in any way when used by persons for breathing in air line type respirators unquote. Please let us have your suggestions for answering."

MR. PECK: You read is it reasonable when the document states it is reasonable.

MR. ROEDER: Okay. Thank you for the correction.

Q: That's what it says with the correction your counsel has suggested, correct?

A: That's correct.

Q: Is this a wire that you would have received at Monsanto?

A: I certainly don't remember it but looking at the document it's addressed to me, yes, so I would have probably received it.

Q: The use that they're referencing in this wire, how would that work, sir, as you understood it?

A: They were using Pydraul AC as an air compressor lubricant which means they would

introduce Pydraul AC into the cylinder of an air compressor to lubricate the walls, lubricate the friction between the walls and piston rings and prevent wear, control the wear on the compressor.

Q: Now, the air that was compressed, that was going to be used and breathed in by individuals who were working at the Crown Zellerbach facility?

A: Would you repeat that, please?

Q: The air that was going to be compressed by the air compressor, was it your understanding the use here would relate to individuals who breathed that air?

A: Let me read it again. No, it reads to me as though they're using Pydraul AC to lubricate air compressors and they're now considering using it in respirator air, they're asking if that was okay.

Q: So as you understood it they were not using it for air that would be breathed but wanted to use it for air that would be breathed?

A: Yeah, I have no knowledge or recollection but that's the way I interpret this wire.

Q: Keep that exhibit and I'll show you the next exhibit.

(Plaintiff's Deposition Exhibit Number 378 was marked for identification)

Q: Exhibit 378, sir, bears production number TNGS 18516 through 18517, and that's a response to Crown Zellerbach Corporation, sir, related to the previous Exhibit 377, correct?

A: Yes, it appears to be.

Q: And the response to Crown Zellerbach states that "It is certainly my opinion of our medical department that the concentration of vapors that would be in the air line would be very minute and should introduce no hazard to workmen breathing the compressed air if it is used for air masks. This is especially true in view of the negative results in our animal vapor exposure", do you see that?

A: I see it now.

Q: That's what it says?

A: Yes.

Q: This was Mr. A. W. Hempelmann the district sales manger's response to Crown Zellerbach based upon the information St. Louis had given him?

A: Our medical department points out, yes, that's correct.

Q: And you would have been the point man, I take it, for coordinating the response in your capacity as marketing services?

A: It would be my responsibility that if the

field sales people asked for information that I would see that the medical department answered them. That was my responsibility.

Q: All right. So the sales people wouldn't call the medical department, you would call the medical department and if they were late in getting a response you would call and ask where it is?

A: Typically that's correct.

Q: So the use suggested in both of these exhibits is that individuals would be breathing air delivered by the compressor, correct?

A: Yes.

Q: And the suggestion made here is that there would be no hazard if the air were first filtered through a mask?

A: Filtered through a filter.

Q: Through a filter, okay.

A: I'm not seeing that exact statement.

Q: Okay. Well, the air masks, I take it that's referring to the masks the workmen would put on?

A: Yes.

Q: So the air would actually be delivered to the masks that they would breath in?

A: That's my understanding.

Q: The exhibit continues "Normally traps or

filters are installed in such lines to take out any odors, vapors or droplets or other foreign material", that's what it says, do you see that?

A: Yes.

Q: Is there a suggestion that traps or filters must be installed in such lines before such a use in this letter?

A: In this letter to me states normally this is done. So I don't understand your question.

Q: I mean, the, the information provided back to Crown Zellerbach when they asked this question regarding the use of Pydraul AC does not indicate, does it, sir, that traps or filters must be used?

A: It says normally they are used and I would concur in the design of compressed air systems regardless of the lubricants, traps and filters are usually used. Whether they must be used or not, I don't see any reference to that.

Q: All right. Was this a, the discussion or the question of whether or not Pydraul AC would be introduced into compressed air systems that workmen would breath, was this a continuing area of inquiry at Monsanto?

A: It was quite minor, quite infrequent.

Q: You say it was infrequent, do you recall any

other instances where questions would be asked, salesmen would then communicate it to you on this topic?

A: Of breathing the air?

Q: Right.

A: I have no specific recollection.

Q: Well, in the air compressors as you understood the Pydraul AC would be used for, what type of air compressors would they be used for?

A: They were usually used in large industrial compressors either for compressing air to separate into different gases, oxygen, nitrogen, et cetera or to provide air in a manufacturing plant through a myriad of things, operate instruments, provide pressure to blow out lines, et cetera, et cetera. The breathing part of it was, was a very minor part.

Q: At least you're aware of the use that it could be, the air could be used as a, for breathing for workmen?

A: There was some people who inquired about using it for that.

Q: And you understood they were using it for that purpose?

A: I have no recollection of customers using it

specifically for breathing air. In reading the memos you presented it appears they were interested in it. Whether or not they used it for that I have no recollection.

Q: All right. Now, these two documents, Exhibits 377 and 378, did you review them in preparation for your testimony today?

A: Yes, I did.

(Plaintiff's Deposition Exhibit Number 379 was marked for identification)

Q: Sir, Exhibit 379 is a memorandum from you to Dr. R. Emmet Kelly dated February 20, 1958, production TNGS 18520. This memorandum also references a potential use of Pydraul AC in which the air that would be compressed by the air compressor would be breathed by individuals who wear air masks or air helmets, correct?

MR. PECK: Objection as to the characterization of the document. The document can speak for itself as to what it says. If you want to ask him about a specific part.

MR. ROEDER: Let me reask the question.

Q: Your memorandum to Dr. Kelly says "We are trying to sell Pydraul AC to the Aluminum Company of America through the chief lubrication engineer at

Alcoa headquarters. This gentelman, John T. Bunting, asked our feelings regarding toxicity if Pydrual AC is used to lubricate an air compressor supplying air to marks (air helmets) worn 8 hours a day, 5 days a week", that's what your memorandum said, right?

A: That's correct.

Q: So you're aware, at least as of February 1959, that Alcoa was interested in using Pydraul AC in air compressors that would supply air to individuals who wear air helmets 8 hours a day 5 five days a week?

A: I interpreted it as Alcoa was interested in using Pydraul AC in air compressors for a number of uses, some of which would include breathing air.

Q: Anyway, Alcoa was interested in the same potential use that Crown Zellerbach was?

A: Yes.

Q: And you would have gotten the request with respect to this use from a salesman and then you would have communicated it in your marketing support capacity and passed it to Dr. Kelly?

A: Yes.

Q: The same thing you did with Crown Zellerbach?

A: Yes.

Q: Did you look at this document in preparation for your testimony?

A: Yes, I did.

(Plaintiff's Deposition Exhibit Number 380 was marked for identification).

Q: Okay. Exhibit 380, sir, is a letter to Mr. S. Facini at Chicago Pneumatic Tool Company dated August 29, 1960 signed by Jack T. Garrett, industrial hygienist, in the medical department. You're listed as a carbon copy recipient on it, correct?

A: Yes.

Q: And for the record the production number is TNGS 7744 through 7745.

You would have received this document in the ordinary course of Monsanto, correct?

A: Yes.

Q: Who is Mr. Garrett?

A: I remember him as being related to the medical hygiene area of Monsanto. I don't remember much more than that but I notice in the document that he had the title industrial hygienist, medical department.

Q: So that was his function, someone who was

concerned with industrial hygiene?

A: Yes.

Q: Is it fair to say you're listed as a carbon copy recipient because the request to Jim Wright probably was given to you and then you would send it to the medical department and coordinate the response to the customer?

A: I would have received a copy because I had some product responsibility and it was my product being discussed in the letter. Now, where the request came from and how it channeled to the proper source, the medical department, I don't know.

Q: So in 1960 you had, you were no longer in the product marketing services area but, in fact, had some more product responsibility?

A: Yes.

Q: Now, Mr. Garrett writes to your customer "As you know the Pydraul fluids are insoluble in water as well as heavier than water. Unless these materials are strongly emulsified they will sink to the bottom of any receiving stream and as such will not give rise to the typical picture of oil pollution." Do you agree with that statement or based on your knowledge do you agree with that statement?

A: I agree with the statement that Pydraul fluids are heavier than water and will sink to the bottom as opposed to petroleum oils that will float on top.

Q: It continues "If the material is discharged in large concentrations it will adversely effect the organisms in the bottom of the receiving stream which will effect the aquatic life in the stream. This effect will probably not be any more serious than the effect of heavy petroleum oils." That's what Mr. Garrett again wrote. I read that correctly?

A: Yes.

Q: Is that correct, as well?

A: I, I don't know. Some of it -- I don't know how to answer that question. Do you want to be more specific in your question?

Q: Was that statement an accurate statement that Mr. Garrett made to Chicago Pneumatic Tool Company?

A: There are several things in here. Well, he states if there's a large amount at the bottom of the stream it will effect the aquatic life. I have no technical information to accept or refute that. I can speak logically but --

Q: All right.

A: His statement that the effect will probably not be more serious than the effect of heavier petroleum oil, I don't fully understand what he's saying or have knowledge of what he's saying. So I don't understand that part of it.

Q: When you had product responsibility at this time, sir, with Pydrauls were you ever concerned about the accuracy of the information that the medical department was giving to customers relating to those products?

A: No. I accepted their area of expertise since I had no medical training.

Q: And the reason that letters like this would be written from the medical department was to be sure that the customer would get as accurate a picture or as accurate an answer as Monsanto could give, correct?

A: That and in addition this was their area of expertise in direct communications and the appropriate way to do it.

Q: And you didn't want to take it upon yourself to make statements concerning an area that was more properly within the medical department's expertise?

A: That is correct.

Q: Did other customers request information to your recollection relating to what would happen if Pydraul fluids were discharged into waterways at or about this time in 1960?

A: I've got to say I don't recall any specifics but it seems logical that's a question that would come up from time to time.

Q: Did you ever suggest that Monsanto should undertake any studies to determine toxicity with respect to discharges into aquatic waterways?

A: I'm hesitating only to try to remember if and when I might have done that. I'm going to answer the same way. I don't remember doing that but if issues came up where we needed the information I would have asked for it. I don't remember asking for it.

Q: And looking at Exhibit 380 doesn't refresh your recollection in any way in that respect?

A: No.

MR. ROEDER: It's 5 to 11. Let's take a 5 minute break.

(Short Recess)

(Plaintiff's Deposition Exhibit Number 381 was marked for identification)

Q: Sir, Exhibit 381 is a letter to Mr. H. H.

Boettcher, Chief Engineer, Air Products, Inc. dated September 30, 1959 and signed by R. Emmet Kelly, M.D.. In connection with your examination of that document let me have the court reporter mark this document as well.

(Plaintiff's Deposition Exhibit Number 382 was marked for identification)

Q: So you can see the context. The court reporter has marked a copy for you, sir.

Okay. For the record 382 is your memorandum dated November 5, 1959 to Dr. Kelly production number TNGS 8260 and the production number for 381 is TNGS 18531 and 18532.

Your memo Exhibit 382 references 381, doesn't it, sir?

A: Yes.

Q: And 381 is a letter dated September 30, 1959 and your memorandum to Dr. Kelly refers to "Your good letter of September 30 to Air Products, Inc.", same one, right?

A: That's correct.

Q: So Air Products was interested in what effect the release of Pydraul AC could have on fish life and plant life, correct?

A: That's what I read here, yes.

Q: Air Products, were they a significant potential customer?

A: Yes, they were.

Q: Your memorandum to Dr. Kelly says that they represent approximately 300,000 to 500,000 per year potential for Pydraul AC, correct?

A: It states that.

Q: That would be a large customer?

A: Yes, it would.

Q: Especially in dollars as of that time?

A: Absolutely.

Q: You wrote this memorandum when you had product responsibility for Pydraul AC, correct? The memorandum I'm referring to is Plaintiff's 382?

A: Yes, what I'm pausing about it's 1959 and -- I would say "yes". Yes, I had product responsibility.

Q: Apparently Mr., how do you pronounce his name, Boettcher?

A: That's how I would pronounce it.

Q: Came back with questions that were not answered by Dr. Kelly's letter and you reference those questions in your memorandum to Dr. Kelly, correct?

A: Correct.

Q: Specifically Air Products as a customer was concerned with the "Botanical effect of Pydraul AC on grass, shrubs, plant life, et cetera, in concentrations of 1 percent to 2 percent, waste water may contain up to 1 percent Pydraul, AC", did I read that correctly?

A: I was reading a different part than you were to catch up to it.

Q: Take as much time as you would like, sir.

A: Yes, I see that.

MR. PECK: I would state for the record you correctly read a portion of the paragraph.

Q: All right. Now, the letter of September 30 from Dr. Kelly he indicates that one could set up fish tests to determine the toxicity, do you see that in that second full paragraph of the letter?

A: Yes.

Q: Was that ever done?

A: I don't know.

Q: Okay. Do you have any recollection of requesting that such a test be performed?

A: I don't have a specific recollection of it, no.

Q: Now, your memorandum to Dr. Kelly dated November 5, 1959, says "Dr. Kelly, difficult as

their request is, I will appreciate your sending further comments to and then you list Mr. Boettcher at Air Products"?

A: Yes.

Q: Why was the request difficult?

A: Because he's asking, because the customer is asking for information that doesn't exist or that I'm not aware existed so it's, it's not easy for the medical department to answer the question therefore it's difficult. That's my interpretation as I now look at these memos.

MR. ROEDER: I will show you the follow-up letter to that, sir.

(Plaintiff's Deposition Exhibit Number 383 was marked for identification)

Q: Exhibit 383 is a letter from Dr. Jack Garrett to Mr. H. H. Boettcher, the same Mr. H. H. Boettcher we been discussing, dated November 16, 1959, production number TNGS 7727 to 7728. This is the medical department's response that you had requested them to make on Plaintiff's Exhibit 382, correct?

A: Correct.

Q: In your view, sir, did this letter answer the questions that Air Products had made regarding

Pydraul AC?

A: Would you restate the question?

Q: Sure. This letter was an attempt to respond to the follow-up questions that Air Products had regarding the use of Pydraul AC, correct?

A: That's correct.

Q: Did it respond to those questions?

A: Your first question was this was an attempt to respond and the second one is did it respond and I'm having trouble seeing the difference.

Q: Well, I've gone over the first question and and I'll just ask the second one.

Did it respond to those questions, that's the only question I'll ask you?

A: Yes, it responded to the questions asked.

Q: Did you ever have any criticisms or corrections to this response?

A: I don't remember.

Q: Would you have been shown this response prior to the time it would have been sent out as a normal practice?

A: No.

Q: Okay. Mr. Garrett's response dated November 16, 1959 indicates that Pydraul AC "Would probably drop to the bottom of any water course into which it

was discharged if it was not strongly emulsified. However, this does not remove the possibility of this material causing damage to aquatic life or bottom organisms. Such bottom organisms are part of the dynamic food cycle utilized by aquatic life," that's what it says, right?

A: That's part of the paragraph.

Q: You agreed with that statement, didn't you?

A: I think you asked a question similar to that earlier and I said I didn't have technical information. At that time I wasn't in medical training or biological training to answer that.

Q: Let me reask the question differently. You don't recall ever disagreeing with that statement, do you?

A: No, I don't.

Q: If you look toward the second page of the document, sir, that paragraph discusses the release of Pydraul AC into a stream and indicates that Monsanto could not answer questions relating to that unless it had additional information, correct?

A: Correct.

MR. PECK: I'll object on a technical basis to the paraphrasing of the statement as to what it says. It speaks for itself.

MR. ROEDER: Well, I'll rephrase the question in light of the objection.

Q: The letter states "We cannot answer your questions concerning whether or not this material can be discharged to a stream because we do not have all the facts available." That's on the previous page on the carry-over paragraph, correct?

A: That's the beginning of the fourth paragraph, correct.

Q: And then if you continue on to the next paragraph, sir, Mr. Garrett says, does he not, "We cannot, however, answer these questions clearly unless we have information concerning the total volume of your effluent, the total volume of the 1 to 2 percent emulsion, other possible contaminants in the effluent, the stream flow with 10 year variations and the classification applied to the stream by the pollution regulatory authorities of Pennsylvania", correct?

A: That is correct.

Q: He continues, "If we had this information we could make reasonable calculations as to what concentration of Pydraul AC would ultimately end up in the receiving stream. If this concentration can be calculated then we can determine if

concentrations in this range are toxic to aquatic life", that's what he wrote, correct?

A: That's what he wrote.

Q: Did Monsanto ever attempt to make such calculations with additional information from Air Products?

A: I don't know.

Q: Okay. Did you ever ask Mr. Garrett or anyone else at Monsanto to follow-up on this particular issue with respect to any of Monsanto's other Pydraul AC customers?

A: I don't recall. From time to time I asked that tests, they consider running some tests. I don't recall this specific one.

Q: Were you aware at any point, sir, whether Monsanto was using Pydraul AC in its own air compressors?

A: I recall that it did.

Q: Where were the air compressors located that used the Pydraul AC?

A: They would obviously be in our manufacturing plants, if there was a use, in John F. Queeny Plant in St. Louis.

Q: Was there use at the plant in Pensacola?

A: I don't recall.

Q: But you're aware of the John F. Queeny air compressor use of Pydraul AC?

A: In reviewing documents yesterday I read reference to it that I knew about it at the time. I had forgotten but now I'm reminded.

Q: All right. In reviewing these, did you review these three documents in preparation for your testimony today, Plaintiff's 381, 382 and 383?

A: I believe I did.

Q: It is fair to say, is it not, sir, Monsanto was aware that Pydraul AC would settle in the bottom of waterways if it were released into those waterways?

A: And if it were not highly emulsified.

Q: How would it be highly emulsified, how would that process work?

A: When air is compressed water condenses out of it as a liquid and the small amounts of lubricant would be included in that liquid and it is quite possible for the lubricant to appear in the water as tiny droplets therefore emulsified.

Q: I see what you mean. So simply in the process of compressing the air?

A: Yes.

Q: It doesn't include or suggest any additional

chemical compound would be added to that?

A: Correct.

(Plaintiff's Deposition Exhibit Number 384 was marked for identification)

Q: Plaintiff's Exhibit 384, sir, is a memorandum from you to Elmer Wheeler dated November 17, 1959 the day after Jack Garrett's letter was sent to Air Products, correct?

A: Correct.

Q: And you were listed as a carbon copy recipient on Mr. Garrett's letter, correct?

A: Correct.

Q: While you have Exhibit 383 in your possession, sir, who is R. A. Fitch, the other carbon copy recipient?

A: The letter address shows he was with Gulf Research. I don't remember the gentleman at all. Gulf was at one time, Gulf Oil was at one time a distributor for Pydraul fluids so it's logical he was someone in the research department of Gulf Oil who is a distributor but that's speculation on my part. I don't remember the gentleman.

Q: Now, your memorandum to Dr. Wheeler says "In line with our recent discussion, this is to request studies on the toxicity of discharge air

from compressors lubricated with Pydraul AC", and then you signed it, correct?

A: Correct.

Q: So that's the memorandum you wrote to Dr. Wheeler November 17, 1959 including that request?

A: That's correct.

Q: Why did you make this request, sir?

A: I don't remember. Obviously, obviously I wrote it, I can see that from the document. I would have written it because of customer interest in knowing but I don't actually recall what triggered this.

Q: Okay. Who is J. W. Newcombe, the carbon copy recipient of your memorandum?

A: He was my boss at one point in time and probably in 1959.

Q: Plaintiff's Exhibit 384, is this the formal way of requesting the medical department to conduct any sort of study?

A: I would say it would be.

Q: Is there any reason that you would send it in a memorandum as opposed to simply rely upon the oral request to Mr. Wheeler or Dr. Wheeler?

A: In the conduct of business if you, if you wanted to convey information it was done in writing

unless it was meetings or informal chats. I would say this was consistent with the way we did business. Nothing different from this memo than any other memo.

Q: So you would give it to Dr. Wheeler and give an additional copy to your superiors so both would be aware of the nature of the request?

A: That's correct.

(Plaintiff's Deposition Exhibit Number 385 was marked for identification)

Q: Now, sir, Plaintiff's Exhibit 385 is a memorandum from Elmer Wheeler to Dr. F. B. Zienty dated December 16, 1959 and both you and Mr. Newcombe are recipients of carbon copies?

A: Yes.

Q: Who is Dr. Zienty?

A: He was in research. I don't remember what part of research but he was with Monsanto in the research department.

Q: Was he a senior Monsanto employee?

A: I was in a management capacity but I don't recall at what level at that time.

Q: He was Dr. Wheeler's boss?

A: Is that a question?

Q: Yeah. Was he?

A: I wouldn't think so.

Q: All right. Well, Dr. Wheeler's request to Dr. Zienty indicates that "In answer to toxicity -- let me rephrase the question.

His memorandum, first of all, states that "We have been asked to express an opinion concerning the toxicity of vapors of the fluid or lubricant which may be entrained in the compressed air." And it relates to the use of Pydraul AC in the air compressors, correct?

A: That's correct.

Q: Okay. It continues, "As you undoubtedly know the use of supplied air masks or respirators is common in many industrial operations. In the past the only hazard has appeared to be the presence of carbon monoxide in the compressed air when the compressor air intake was located near a source of carbon monoxide as in the case of portable gasoline-engine operated compressors." Dr. Wheeler also wrote that, correct?

A: That's in the memo.

Q: Dr. Wheeler --

MR. PECK: He's not a doctor.

Q: Mr. Wheeler requests Dr. Zienty, does he not, to have someone in the research department

analyze samples of air for Pydraul AC components?

A: Where are you?

Q: The last paragraph.

A: He's asking if it's possible to do this.

Q: Right. And he indicates, doesn't he, "In answer to toxicity inquiries, we have pointed out, without disclosing the composition of Pydraul AC, that we would not expect any detectable concentration of Pydrual AC components to be carried into the compressed air"?

A: That's what it says.

Q: Mr. Wheeler was concerned about overcoming possible sales resistance to the use of Pydraul AC if Monsanto possessed analytical data to confirm the opinion he had given to customers of Pydraul AC, isn't that correct?

MR. PECK: Objection to the form of the question. The document speaks for itself as to what Mr. Wheeler said.

MR. ROEDER: Let me rephrase the question in light of the objection.

Q: Doesn't Mr. Wheeler say "We would be in a stronger position to overcome possible sales resistance to the use of a fluid containing undisclosed components if we had analytical data to

confirm our opinions"?

A: It says that.

Q: Does this refresh your recollection as to the request made to conduct this research?

A: No.

Q: It also indicates "We would be happy to collect the samples from one or more compressors in the Queeny Plant using this fluid." He writes this, as well?

A: Yes.

Q: Is this the statement that refreshed your recollection Queeny had used Pydraul AC?

A: Yes, it is.

Q: So you looked at this document in preparation for testimony today?

A: That's correct.

Q: Do you know what happened with respect -- first of all, were there any studies made of the Queeny Plant and the, whether any Pydraul AC was emitted through the air that was compressed in that plant?

A: I don't recall that, whether it was or was not.

Q: Would that have been -- strike that question. Let me see if I can refresh your

recollection.

(Plaintiff's Deposition Exhibit Number 386 was marked for identification)

Q: Exhibit 386, sir, is a memo from Dr. Munch, he was a doctor, right?

A: Yes.

Q: To Mr. Wheeler dated December 30, 1959 regarding Pydraul AC vapors in compressor air. You received a copy of this memorandum, did you not, sir?

A: This shows I received a copy.

Q: Production number TNGS 18556.

In this memorandum is it fair to say that Dr. Munch summarizes the conclusions reached regarding analytical work to determine whether toxicologically significant amounts of Pydraul AC are entrained in the compressed air from air compressors lubricated with that fluid?

MR. PECK: Object to the form as to what the document states. It states what it says but you can answer the question.

A: The memo states that this summarizes a discussion between Dr. Munch and Mr. Wheeler.

Q: And the conclusion reached was that Monsanto and its research department was not going to do the

analytical work but request Liberty Mutual Insurance Company have the work done?

A: I read it as saying unless there's a lot of people asking for this Monsanto would prefer it be done outside by Liberty Mutual Insurance.

Q: Did you participate in any of these discussions?

A: No, not that I recall.

Q: Were such studies ever done?

A: I don't recall that.

(Plaintiff's Deposition Exhibit Number 387 was marked for identification)

A: Exhibit 387, sir, is your memorandum to G. R. Buchanan?

A: That's correct.

Q: Dated January 16, 1961, approximately a year after Exhibit 386. Production number is TNGS 18608. Paragraph 2 of your memorandum states "Some tests by our medical department performed in 1960 indicated little or no contamination of air with Pydraul AC in one compressor (in the Queeny Plant), lubricated with this material." Did I read that correctly?

A: Yes, you did.

Q: So, in fact, there was a test performed of

Pydraul AC by the medical department?

A: Apparently so.

Q: And you would have received a copy of that report?

A: I should have. Whether or not I did I don't remember. But I should have.

MR. ROEDER: For the record, Counsel, we had asked for copies of these documents related to the Queeny Plant and tests done. I will follow this up in writing pursuant to Ms. Rutter's request but I think it relates to these issues and they have not been produced and I think we're entitled to that. So I'm making that statement on the record.

MR. PECK: Okay.

Q: What, what does this indicate to you, sir? What did it indicate to you in 1961, that little or no contamination of the air with Pydraul AC was found?

A: What did it mean to me?

Q: Right.

A: It meant to me, what it meant to me then I don't remember. What it means to me now is that the state of the technology at the time there was, there was very little, if any, lubricant in the air.

Q: So you didn't think it was a concern?

A: I can't draw that conclusion either way. I'm quoting our medical department in 1961.

Q: Right. Well, the conclusion of the medical department was that there was little or no contamination of the air, correct?

A: That's what it says. That's what the document says.

Q: And so there -- was there any statement or action you took in relation, statements you made or actions you took in relation to this conclusion? Let me rephrase the question.

A: Please.

Q: I'll try and do it a little better.

Was this information that you would use in your capacity at Monsanto, that the medical department had found little or no contamination of air with Pydraul AC in the compressor they studied?

A: Would you repeat that?

MR. PECK: Could you repeat that, Miss Court Reporter?

(The reporter read the record as requested)

A: And I would answer that's a statement of fact when asked, as I was in this case, about, about the use of Pydraul AC in this case, a poultry application. I would rely on the facts that came

from the medical department that was in this test they found little or no contamination of the air. So, yes, at the appropriate times I would use that statement.

Q: So if a customer called you up and gave you this situation and asked you has your research discovered whether Pydraul AC is contaminated in the air which is compressed you would say based upon the facts you had and disclose to them what your medical department had determined?

MR. PECK: Object to the form of the hypothetical question.

MR. ROEDER: I'm trying to find out how you would use this.

Q: If a customer called you up with this information would you repeat the information you indicated in your memorandum?

A: My knee jerk reaction is probably not. It depends on what the customer was using the air for, what pressures, what tempreatures, what did he want to know and why. When it was appropriate I would use that comment and it was in this case.

Q: Would the use of the air in an air -- how would the use effect your answer of the air, you said you would want to find out how the customer was

using it?

A: If the air was used for breathing I would refer it to the medical department. This was not an adequate statement I don't think. If the air was used in an industrial process. That's probably one of a number of statements I would make. The other statements would be in our literature. If it were used for -- we didn't make electro, I'm thinking of the electronics industry and the super clean rooms. I don't think they barely existed then. Again I would say it's a specific use and I would refer to to someone better qualified to answer. But for a general industrial application I would, I could well have made that statement along those lines.

Q: Did you ever request after your initial memorandum to Mr. Wheeler that other studies be done of Pydraul AC as it was used in air compressors?

A: Other than the study in the document we looked at earlier?

Q: Right.

A: I don't recall requesting other studies.

Q: Do you recall it being an issue after this point in the early 1960's?

A: Specific to Pydraul AC?

Q: Right.

A: No.

Q: How about with respect to Pydrauls?

A: At some point in time there were, there was new information on the ecological impact of Pydraul fluids, generally not the air compressors, and so at that time the issue came up again and I think studies of that nature were done.

Q: Okay.

(Plaintiff's Deposition Exhibit Numbers 388 thru 389 marked for identification)

Q: Exhibit 388 is a memorandum dated April 18, 1960, correct, that's your memorandum?

A: Yes.

Q: Exhibit 389 is a letter that you requested in Exhibit 388 that the medical department write, correct?

A: That's correct.

Q: Exhibit 388 has production number TNGS 18562 and Plaintiff's 389 has production number TNGS 18564 to 18565.

Is it fair to say that this was becoming at least a, if not a routine issue with respect to Pydraul AC, one that would come up from time to time where a customer would call and ask questions with respect to the toxicity of Pydraul AC and you would

refer the letter or request to Mr. Wheeler who would then send out a reply promptly to the customer with respect to toxicity of the product?

A: I think you've asked two things. The second part of the question, when a question came in about the toxicity of Pydrual did I refer it to the medical department for the answer, I did.

The first part had to do you with the frequency of this becoming an issue. I remember it as quite infrequent. We looked at a few documents over a four year span so that doesn't seem like a huge frequency and I don't remember it being a huge frequency.

Q: But your request to Mr. Wheeler was dated April 18, 1960?

A: Yes.

Q: And the response was sent out two days later on April 20, 1960?

A: That's correct.

Q: So it seems as though they're able to draw upon information they had or get the letter done fairly quickly, would you agree with that?

A: Yes.

Q: Mr. Wheeler writes to Mr. Hooper who is the recipient of the letter, at Phillips Chemical

Company, April 20, 1960, on the second page he writes "We believe that any Pydraul AC carried over in compressed air or gases presents no significant toxicity hazard to humans breathing the air or gas." That's what it says, right?

A: That's what it says at the beginning of that paragraph.

Q: And you don't recall disagreeing with that?

A: I had no information to cause me to agree or disagree so I relied on the medical department.

Q: Was Phillips Chemical Company potentially a large purchaser of Pydraul AC?

A: I don't remember that. They were now in the air liquefaction business so they would not be as large as other customers referred to earlier. I have no recollection of their potential size.

Q: When you use the term air liquefaction what did you mean by that?

A: Some of the documents related to Air Products Company which uses huge amounts of air to compress them, liquefy them and distill them into oxygen, nitrogen, argon and other gases. That was probably the largest amount of air compressor lubricant for which our product would have been used as opposed to plant maintenance air, processed air.

Q: How about gas transmission companies, natural gas transmission companies, where do they fit into the spectrum?

A: In between those two.

Q: So the very large company, the air liquefaction companies, would they actually create or manufacture or process an air product, so they would split up argon?

A: Yes.

Q: So then would they compress argon and sell argon?

A: Yes.

Q: And compress oxygen and sell oxygen or liquid oxygen in the compressed form?

A: Yes.

Q: The people, the lowest or smallest users just on the general characterization, are people that want air capacity for air hoses in a plant?

A: That sounds fair, yes.

Q: And they wouldn't be using it necessarily in their operations but they might need air to run tools, for example?

A: Yes.

Q: Things of that nature?

A: Yes.

Q: Or to clean?

A: I think you're describing maintenance kind of air requirements, yes.

Q: And you would put the use of air by natural gas transmission companies in the middle of those?

A: Somewhere in between.

Q: Were natural gas transmission companies large purchasers of Pydraul AC?

A: As I recall they were significant purchasers.

Q: What in your, to your thinking would be a significant purchaser?

A: The total Pydraul AC volume is not very large and how many dollars or gallons were purchased by a gas transmission company I have no recollection. They were not buying in tank cars, they were not buying in five gallon cans, they were buying in drums. How many drums, frankly, I don't recall.

Q: Would you be able to determine or form a conclusion yourself if they're buying drums that they're using the Pydraul AC?

A: If they're buying the product would I surmise they're using it?

Q: Right.

A: By logic I would.

Q: And would you also surmise by logic that if they have a system where the Pydraul AC is already in the air compressor, if they're continuing to buy Pydraul AC then the Pydraul AC that's in the system is either being used or is being emitted, when I say used I mean destroyed in the process of its use?

A: In the lubrication of an air compressor, which is what I believe you're talking about, lubricant is introduced in the cylinder of the compressor on a continuing basis and typically with any lubricant is discharged from the compressed air along with the condensed water. We talked about that earlier..

Q: Now, the letters that we have looked at, we looked at several today, for example, Plaintiff's Exhibit 389 to Phillips Chemical Company, the reference to filters that's contained in those letters is with respect to potential uses of the air that's compressed that humans would breath, correct?

A: There are other reasons to filter things out of the air, whether it's droplets of water or droplets of oil or droplets of Pydraul. I could envision in some applications you want these removed.

Q: I'm just talking about the references that we've looked at, whenever there's a reference to filters the context in which we have seen thus far in these exhibits all relates to someone potentially breathing in the Pydrual AC that has been compressed, is that not correct?

A: It has up to now. I'm not sure if this one speaks about breathing air. I'm still not sure that it does. But it speaks to the, it speaks to the question of toxicity of breathing air which contains, you know, which has been compressed and equipment lubricated with Pydraul AC.

Q: The letter to Phillips Petroleum states "We believe that any Pydraul AC carried over in compressed air or gases presents no significant toxicity hazard to humans breathing the air or gas"?

A: Yes. To me that does not mean it's an air helmet someone is wearing but discharge of the air into the atmosphere where someone can breath it. For example, from pneumatic instruments.

Q: All right. Okay.

Now, the reference in the paragraph right above that says "We believe good industrial practice dictates compressed air systems providing air to workmen engaged in sand blasting or other industrial

operations include air line filters." That reference is one for people who are breathing that air, right?

A: That isn't clear whether this is for the workers in air helmets or talking about the air in the, providing pressure to the sand blasting equipment but in either case the air is in the vicinity of the workmen.

Q: Okay. Now, had you ever visited a natural gas transmission company yourself personally?

A: I have a recollection of visiting one.

Q: Which one did you visit?

A: I don't remember.

Q: Do you have a recollection of where you went to visit?

A: It was south of St. Louis but I don't remember.

Q: That includes a lot of area.

A: I don't remember which one. I did visit one. There was no specific reason to visit other than it was a customer and it was an opportunity for me to see firsthand an application. I remember hearing a noise so loud I never heard before. I was not able to walk a straight line. It was a big experience.

Q: Who did you go with?

A: I went with a salesman and I don't remember which salesman.

Q: Was there an air compressor that was used in the natural gas transmission company that you visited?

A: I remember the gas turbines. I don't remember seeing air compressors, although if it were a customer of Monsanto's Pydraul program it's logical they had air compressors. Whether they were lubricated by Pydrual or still a potential customer lubricating with oil that I don't remember. I just remember going to a gas transmission station.

Q: So this was a station? We hadn't established that in the record. This was a station, you went to a station not to a general corporate office, correct?

A: Yes.

Q: And you went with a salesman who was attempting to sell one of the Pydrauls?

A: As I say, it was either a customer or potential customer.

Q: You heard a very loud noise, loudest you ever heard at least up to that point?

A: Loudest sustained noise I had ever heard.

Q: Do you know how the Pydraul would be used at

that gas station, gas transmission station?

A: The only application I'm aware of Pydraul in a gas station, in a gas transmission station, would be in air compressors used to start up gas compressors.

Q: Do you know when this visit occurred?

A: No, I have no recollection.

Q: Well, can we agree that it would have been prior to 1968ish when you testified your responsibilities changed?

A: Yes.

Q: And the use of the Pydraul AC that you were familiar with, from visiting this gas transmission station or simply through the course of your job, was that Pydraul AC would be introduced into the air compressor?

MR. PECK: Objection to the form of the question. It's characterizing his testimony Pydraul AC was used at this station. I think his testimony was otherwise.

MR. ROEDER: He's not sure is his testimony. Let me rephrase the question.

Q: You had an understanding, did you not, sir, as to how Pydraul AC would be used in a gas transmission station?

A: I'm aware of the application for which gas transmission companies use Pydraul AC.

Q: How did you become aware of that application?

A: My best recollection is from customer communication to Monsanto, that I am using or plan to use Pydraul AC in air compressors which we use here to start up gas compressors. That's a hypothetical statement. I don't remember any such statement but it was typical how I would learn about a customer's application.

Q: So the, your recollection or best understanding as you look back on it is you understand customers would use the air compressors to start up the gas compressors?

A: That's my understanding.

Q: And in the process of using a Pydraul AC in that application Pydraul AC would be added to the compressors, for example, to top up the compressors so it would have enough lubrication?

A: No, that's not my understanding.

Q: Why would someone need it, why would someone come back to Monsanto and buy more?

A: As I said, it's my recollection that the cylinder lubricant and air compressor was added drop

by drop to the cylinder, to where the wall or pistons were rubbing and that was quite separate from all of the bearings and everything that make the machine run. And it was a continuous drop wise lubrication of that cylinder. There was no way a lubricant could stay there permanently so it was continually added.

Q: It was a closed system, was it not, sir, so the Pydraul AC would be added and then as it cycled through the system it would be added again?

A: Pydraul AC would be added to the cylinder. That Pydraul, some would remain and some would be removed with the air either as a liquid or vapor. It would be condensed along with the water that would be caught with the condensed water and, therefore, new lubricant had to be added on a continuous basis.

Q: Now, the drop by drop use of the Pydraul AC that you discussed, that would occur mechanically inside the air compressor, right?

A: Yes.

Q: And so somebody at the beginning of the operation before they started up the air compressor would make sure there was a sufficient quantity of Pydraul AC, correct?

A: That's logical, yes.

Q: And then they would check it, either after they turned it off or in operation to see whether there was still a sufficient amount?

A: That would be speculation on my part. I don't see a problem.

Q: All right.

MR. ROEDER: Let's take a break.

(Short Recess)

Q: Would you keep track, sir, of the amount of purchases that would be made by gas transmission companies as opposed to, in the, how did you describe it, the air liquefaction customers, would that be part of your responsibilities as a product manager?

A: It would not be an ongoing responsibility. My interest would be in the total volume of sales, potential sales of the product and at times a specific customer volume but industry by industry, application by application for Pydraul AC, no, I would not, not normally have that information.

Q: Out of the different Pydrauls, was Pydraul AC a larger or smaller component of the product group in terms of sales?

A: Smaller.

Q: The Pydraul 200's you described, for example, that's in the die casting use?

A: Correct.

Q: That would be a much larger use?

A: That is correct.

Q: Was it an area of use that Monsanto expected would grow larger?

A: There were not very large expectations for that, although there were certain potential uses for air liquefaction which were a very significant volume.

Q: But certainly the air compressor uses for natural gas transmission companies, that was a very limited use, correct, the market wasn't huge on that?

A: The market was not huge in the context, no. The market was not huge.

Q: Was not a growing market that you would anticipate would significantly increase over time, correct?

A: The growth of sales of air compressors was, to the best of my knowledge was not huge so it was a matter of penetrating the market. I think the amount of penetration that occurred and was expected was pretty limited. So the bottom line nice but not

a horrendously large application.

Q: It's fair to say, is it not not, sir, that the Pydrauls that Monsanto sold were very profitable though in terms of the profit realized for the sales of the product?

A: I don't know as I would say that. In 1956, 7 there was no profit there. In later years there was significant gross profit but high sales and tech service expense so that the dollars of profit, or percentage of profit would, were not overwhelming.

Q: Was a 40 percent gross profit a good profit in your view?

A: For a typical chemical that would be very good. For a chemical that required high tech service and et cetera, et cetera, you've got to subtract that from the gross profit to get a net return to the company. So I would say that's pretty much what it had to be.

Q: Was that part of your responsibility to subtract out the costs of technical services and such?

A: I wish you would clarify the question.

Q: In answer to the previous question you indicated that, you know, you would have to subtract out the costs associated with this particular

product to find out its real value to the company, at least that's what I understood you to say, is that fair?

A: Yes.

Q: Was it part of your responsibilities to calculate those costs and net them out?

A: No, it was not.

Q: So what you're indicating what, what it had to be, you're basing your testimony on your guess or supposition of what the costs would have been, is that fair to say?

A: I was informed of what the costs were.

Q: By whom?

A: By my superiors.

Q: Which would be whom?

A: When?

Q: Well, I mean, let's say in 1957 or '58 as you discussed earlier who would have informed you of the costs or who did, do you recall?

A: '57 and '58 as I recall from the documents my immediate superior was John W. Newcombe who would have received the information from his superiors and passed them down.

Q: If the division or the products were not profitable, did you have, wouldn't you have had a

concern as to whether or not your future lay in the air?

MR. PECK: Objection to the form of the question. It lacks foundation. His testimony was that the product was not profitable. But you can answer.

MR. ROEDER: Let me rephrase the question in light of the objection.

Q: Didn't you have concerns over the profitability of the products that were being sold when you were selling them?

A: At some point in time fairly early in my Pydraul days there was concern that the Pydrauls were not returning any, any money to Monsanto. In fact, they were at one point at a loss. And I recall with the help of the accounting department and my superiors having to find out the details of that and discovered such things as allocated quantities of monies were, arbitrary allocations were not appropriate, et cetera, et cetera. So to that extent I was involved.

Q: When did you do that?

A: In the early days of my Pydraul experiences and I would guess it would be 1957, 8, somewhere in there.

Q: Mr. Newcombe would ask you to look at the issue and you did? I'm trying to figure out what you specifically recall you did?

A: That was Mr. Art Kroger who brought it to my attention, who was Mr. Newcombe's boss. He was director of sales.

Q: So did Mr. Kroger say to you in words or in effect that we're not making any money on this, go find out why?

A: I remember seeing a statement, again early on, Pydraul fluids, I think this is when I began my Pydraul supervisory role, Pydraul fluids are not profitable, find out why.

Q: Did you do something about it?

A: Yes, I did.

Q: Did they become more profitable after you investigated the issue?

A: Yes, they did.

Q: How did they become more profitable?

A: One way I alluded to already was the allocation of sales expenses was based on a different part of the product line, namely our aviation industry, and those allocations were adjusted to be more appropriate for the amount of service rendered. There were things involving a

commercial enterprise with another company which involved the aviation fluids and some of the industrial fluids we were able to make some adjustments in that contract. Things such as that.

Q: What you discussed, sir, really relates to Monsanto's own ability to accurately track and allocate the costs that should be associated with the product, right? For example, the aviation industry costs, your testimony is, is it not, that too much of the aviation industry costs were allocated to Pydraul when they shouldn't have been allocated that way, right?

A: Generally correct. More accurately the same type of allocation was used for industrial application as had been used for the aviation application industry and they weren't warranted if you look at the actual hours that went into it.

Q: So the actual profitability of the product as you understood it had to be determined by accurately assessing the costs associated with that product and matching that up with the revenues derived from that product, right?

A: How do you mean matching up with revenues?

Q: Well, to know whether a product is profitable you have to know the costs associated

with that product?

A: Right.

Q: Directly or indirectly?

A: Correct.

Q: And what you're testifying to with respect to the aviation industry is that a cost associated with that product was too high as it was estimated by Monsanto?

A: No. What I was saying is if you assume the same level of technical support, et cetera, for industrial fluids as you do for aviation fluids you find too high an expense for what's actually being done period and, therefore, the reduction of the gross profit, the reduction of the profit in gross to net was not accurate.

Q: I think we're saying the same thing only in different terms. The Pydrauls required less in terms of that service than the aviation fluids?

A: That's correct.

Q: Monsanto was estimating a much higher number than was appropriate with respect to Pydrauls because it was using the wrong standard, the aviation standard?

A: You're getting quite specific but I don't disagree with what you're saying.

Q: And the commercial enterprise that you discussed then related to a contract with someone also in the aviation area?

A: Yes.

Q: Those are all Monsanto internal tracking issues what costs were allocated to the Pydraul to determine how profitable it was, is that correct?

A: That sounds correct from my understanding.

Q: And after, I presume you were able to effect a change in the way those costs were attributed to the Pydrauls?

A: That's correct.

Q: And that was early on in your tenure in the marketing area, so about '57, '58?

A: Yes.

Q: After that time is it your view the product was profitable?

A: It was never looked at by the company as a real star profit performer as were some other products but, but they were profitable enough to continue the sales effort that had products. The Pydrauls were not very large or not very profitable in Monsanto's eyes.

Q: Well, the -- well, the biggest business Monsanto would be interested in as a general

practice would be the agricultural area, is that correct?

A: It didn't exist at that time.

Q: Monsanto had no agricultural division at that time?

A: There was some -- no, it did not.

Q: Okay. Well, as you understood it, if you, what is the business that had the greatest potential and profit for Monsanto when you started in the Pydrauls?

A: I was not speaking on a corporate basis but in the fluids area. As an example Skydrol was a more profitable product in both volume and percentage than Pydraul.

Q: So Pydraul was a small sort of niche product?

A: I'm not sure why you say or what you mean by niche.

Q: Let me define it for you then. Well, there were several products produced under different names in the functional fluids or specialty products group?

A: Correct.

Q: You had the Aroclors denominated as such, correct?

A: Yes. They were not in the fluids group when I entered it.

Q: But were when you left?

A: But were when I left.

Q: And Aroclor was a trade name Monsanto had, correct?

A: Yes, correct.

Q: And it referred, did it not, generally to the use of PCB containing products for the dielectric industry?

A: Chlorinated biphenyl products for the electrical industry.

Q: So in transformers and capacitors, correct?

A: Yes.

Q: And that was the most significant part when you left that industry or left that group, would be it for the dielectric industry, transformers, capacitors, that was the most significant portion of sales that were made in these areas, is that not correct?

A: I don't think so. Do you want to get more specific?

Q: Sure. We'll see more documents. I'm just trying to see what you recall before we go into the documents.

There are Therminols, you had responsibility for them?

A: Yes, I did.

Q: Was that a larger portion of the business than the Pydrauls?

A: It started very small, it was quite profitable and it grew to significant size. So now we got to talk about a point in time.

Q: When was it small and when did it grow to significant size?

A: In the later 1960's -- in the early 1960's it was kind of an offshoot of the electrical application. A case where a customer took an existing product and put it to its own use. In the late 1960's I was asked to handle the commercial aspects of the products and we took a different marketing plan structure and it began to grow. Typical growth curb starts slowly and gains steam and it retained significant profits and grew to quite a large size. Your question was when was it large?

Q: Right.

A: It was probably in the mid 70's it began to be significant and after I left the area, in fact, after I retired it continued to grow to a large

size. You know, large is relevant, relative.

Q: Sure. How big is a box and how long is a string?

A: It began to be noticed on a corporate wise basis probably in the '80's.

Q: Okay. Now, the, when you were involved with respect to the Pydrauls did they ever reach a point where you would consider your sales significant?

A: On a corporate basis, no. On an organic chemical division basis, maybe.

Q: Did you make that, did you yourself think we got a pretty good little business here, we're making money, we're selling, people are buying, we're showing a need, didn't you answer those questions yourself as you would perform your duties at Monsanto?

A: I don't know if I ever looked at it that way, but in fairness there was an ongoing business, there was a need for supplying that need, customers were buying, we were producing. It was an ongoing business. I didn't see it at the top of the corporation or something down at the bottom to be just ignored. It was a business.

Q: And Monsanto was the sole producer of PCB containing fluids in the United States, was it not?

A: That's correct.

Q: So it was your business -- did you have any concerns as to whether or not there would be additional market entrance in the United States?

A: For what?

Q: For PCB containing products?

A: There was also a concern, even if you're the sole producer that some day a competitor may come in so we tried to conduct our business in that way.

Q: How did that effect how you conducted your business?

A: It was more of an interest in the dielectric application than to mine. We had significant competition from other chemistries and if someone else were to make PCB's in the United States or import PBC's but I don't think it would have a big impact on our business.

Q: For example, there are phosphate ester applications that competed directly with the Pydrauls, correct?

A: Correct.

Q: But there was no particular formulation that competed directly with the dielectric use, is that also correct?

A: That's correct.

Q: So they sort of have the little monopoly in that respect?

A: Only in the United States.

Q: Okay. Now, did there come a point in time, sir, where the use of Pydrauls became -- strike that. I'll rephrase the question.

At what point did you believe the Pydrauls were profitable in your use and I should say your sale of that product?

A: Profitable is a relative term. When I started they were not earning a profit, within two years they were earning a profit. One to two years. Would I call them profitable? That's a relative term. I never thought of them as a really high profit product.

Q: Did you think of them as a steady profit producer?

A: Yes.

Q: And as a person with product responsibility would your performance be judged based upon the profitability of the product?

A: At that time I didn't feel that kind of pressure in the company, no. I do recall a series of higher management levels in the company changing from time to time anywhere from the product manager

should have keen responsibility for the profits of the product to it's none of your damn business, just market it. So again when you're talking about --

Q: In the '56 to '58 period you didn't have product responsibility, right, you were just market and support?

A: Correct.

Q: So '58 on you had product responsibilities?

A: Yes.

Q: So from '58 to '60, the time period we've been looking at in these documents as far as your testimony here, did you have a responsibility for the profitability of the product?

A: In the context of those years I was, you know, if it was losing money they said do something about it. If it was making money nobody said anything much. So did I have profit responsibility? Partial responsibility.

Q: Well --

A: Along with my bosses.

Q: Would you be annually reviewed, would you be annually reviewed?

A: Yes.

Q: So come review time you would sit down in an office with your superior and one of the things that

they would discuss is whether the product is profitable, correct?

A: I don't remember those discussions on profitability. I remember discussions on volume, because we would forecast what volume we would sell and we would either sell that much more or less. Profitability didn't come into it very often unless there was an extreme, it's losing money or making a tremendous amount of money.

Q: Would you be involved in the forecasts?

A: Yes.

Q: And, for example, from the period of '60 to '64 what would your involvement in the forecasting of the sales of Pydrauls include?

A: From '60 to '64?

Q: I'm just trying to get a feel. If there's a more convenient time in the 60's let me know. I just picked that arbitrarily.

A: Usually someone from accounting would ask our department, either me directly or my boss, to give a forecast of how many pounds we would sell, gallons, in the following 12 months, calendar, and what our average prices would be.

Q: Your boss was who at that point?

A: John Newcombe.

Q: Still Mr. Newcombe. And how would you go about preparing your forecast?

A: This is pre computers.

Q: More art than science, I guess?

A: We might draw a curve of what the growth or decline looked like. We would consider anything big happening on the horizon like a new application was found or something like that and fairly conservatively we would forecast a number. It was pretty much seat of the pants.

Q: Well, the application for the air compressors, that first came on line in the late 50's, that was your testimony, correct?

A: The late 50's or early '60's. I don't remember.

Q: We seen a document today from 1958 that related to Pydrual AC?

A: Right.

Q: So after the Pydraul AC application was found did the sales increase with respect to sales of Pydrauls?

A: Very little.

Q: Very little. Okay. Did that also follow a typical growth curve as you've indicated the Therminols did later?

A: I don't recall Pydraul AC being large enough to have been plotted in the shape of the curve. It started at zero and began to add customers as we did get volume. It was never large in the shape of the curve of any significance.

Q: So in the '60 to '64 period that we're discussing you sit down with Mr. Newcombe, come up with the seat of the pants idea where you expected to be next year and these numbers would be submitted to the accounting department and you would have some projection where you would hope to be in the following year, is that correct?

MR. PECK: Object to the form.

A: Right.

Q: Did that process change from '64 to '68?

A: Not that I recall. It had gotten a little more sophisticated but not that I recall.

Q: Did Mr. Newcombe remain your superior?

A: No, Mr. Buchanan replaced him at some point in time.

Q: Mr. Buchanan's first name is what?

A: George.

Q: What happened to Mr. Newcombe?

A: He had a different assignment. Actually both of those gentlemen were in the petroleum oil

additive department to which the fluids department reported at that time. Mr. Newcombe stayed within the automobile oil additive area but no longer associated with fluids.

Q: Mr. Buchanan, when he came in was there a difference in the way you would plot out your projections?

A: I have no recollection of that.

Q: Did the sale of Pydrauls increase from the '64 to '68 period?

A: As I recall they did.

Q: How about the sale of Pydraul AC?

A: I have no specific memory. The documents suggest it but I don't recall.

Q: When you, in '68 when you assumed the responsibility with respect to Therminols as well, that was a promotion, correct?

A: I got to smile and say my title didn't change and I didn't get any more money. I was given an added responsibility. I didn't see it as a promotion initially.

Q: Were you given the responsibility because the Pydraul sales weren't sufficient to support your total attention?

A: No.

Q: Is this about the time when the Therminol sales began to take off?

A: When I was given responsibilities for the Therminols there were a few customers using chlorinated biphenyls on their own as heat transfer fluids. There wasn't a marketing program. It was given to me so it could get some specific attention to develop a marketing program for it. It had nothing to do with Pydraul.

Q: So what's happening is people either had an Aroclor or Pydraul AC and they were putting it to use in a heat transfer application?

A: I don't understand that question.

Q: Sure. Until there was a formal Therminol marketing plan is it fair to say customers were using non Therminol products in a heat transfer application?

A: A few customers.

Q: So some customers would have a dielectric PCB containing fluid, for example, and might use it in a heat transfer application?

A: The word containing is not necessarily correct. A few customers purchased chlorinated biphenyls which was used in dielectric applications and in non fluid applications and attempted to use

it as they would a petroleum oil in a heat transfer system.

Q: Would they get your approval prior to that use?

A: I was not involved at that time so you want to --

Q: I want to know whether this use was an unauthorized use by the customers and Monsanto discovered, hey, this is a good potential market or is this something Monsanto encouraged?

A: It started -- first of all, it was not my responsibility when it started. That was Mr. Benignus.

Q: I understand that.

A: So what communications went on between Mr. Benignus and others I have never been privy to. I am aware that an engineer from Monsanto was assigned to work with Mr. Benignus to help understand the application, help the customer use the product properly.

Q: Do you know what customer this was?

A: No. I remember the engineer but not the customer.

Q: Who was the engineer?

A: Bill Davis.

Q: Any relation?

A: No.

Q: So the other Mr. Davis was working with Benignus because they learned the customer was using this in heat transfer application and wanted to develop this as a potential in the market?

A: The customer was asking for advice using the product and Monsanto responded by assigning an engineer who knew heat transfer systems.

Q: Is it fair to say this engineer then came back and said, this is a good use, potentially a good use and we should exploit it?

A: I don't think the engineer would have said that.

Q: Said anything like that, like this is a new market we should look into or words to that effect?

MR. PECK: I object on the grounds it calls for speculation since his testimony has already been he wasn't involved at this time. Answer if you know.

MR. ROEDER: Let me rephrase the question in light of the objection.

Q: Did Mr. Davis ever tell you his involvement in the development of the Therminol use or discuss it with you?

A: No. Mr. Davis told me of his technical involvement, the engineering aspects.

Q: And you took that to develop into a marketing plan?

A: No.

Q: Tell me how it worked then?

A: When I was given responsibility to develop a marketing program for heat transfer fluids and I went out and looked at heat transfer systems to try and understand what the market was like. What they wanted, what was needed and so forth.

Q: And then you would draw upon the technical information that the engineer Davis had in preparing the plan?

A: Very little. With some input but very little.

Q: How about, up to this point, sir, we're getting perhaps a little bit ahead of ourselves in relation to the documents that were selected, but up to 1960 from the documents that have been looked at you're aware that the Pydraul AC's, for example, if released into the water would settle at the bottom, right?

A: If it were not emulsified it would settle in the bottom.

Q: If it were emulsified, sir, and you were in the water that, emulsified in water which was then emitted into a waterway, what would happen to that PCB containing fluid?

A: You can't tell whether it would remain emulsified and be washed away or something in the water would cause the emulsion to break. I have no way of knowing.

Q: So if it stayed within the water it might just wash but if it precipitated out it could also emulsify?

A: Answering on a technical basis that's correct.

Q: Was there discussion or that you participated in relating to the disposal of Pydraul fluids? How are Pydrauls disposed of as you understood it?

A: Which Pydrauls?

Q: Any Pydrauls, was there a procedure set in place or guidelines given to customers as to how to dispose of them?

A: Initially, no. Well, there was, there were safe, safety and handling information always provided to customers, literature, labels, et cetera. Specific to disposal, I don't recall early

on that there were, it was information provided. In that the customer was already using something else, disposing of it in some way.

Q: Well, as a person with product responsibility did you deem it to be part of your job responsibilities to determine how the customer was disposing of the Pydraul he bought?

A: Pydraul, no. Not in 1956, 7, '60.

Q: '61, '62, '63, in that time period?

A: Somewhere in that time period, as I said earlier I don't remember the date, but it was somewhere in the, I think late 60's, Monsanto, along with the rest of the world, became informed that there was some ecological issues to be examined. Before that time, no.

Q: Now, prior to the time that you testified Monsanto became aware of these ecological issues, you personally were aware of the characteristics of the Pydraul fluids that recommended them for their uses, weren't you?

A: Yes.

Q: And I'll make the question a little more straightforward but I wanted to get the general answer. For example, Pydrauls were very stable thermally, it took a lot to burn them?

A: That's quite a different issue. They were, they resisted burning. They were fire resistant is the way we put it.

Q: Otherwise known as thermal stability?

A: No.

Q: Okay. But they were stable, did have a rating of thermal stability as well, did they not?

A: Compared to what? No, they were less -- no.

Q: Well, in the thermal stability that would be important in the Therminol or heat transfer business?

A: That correct.

Q: So you could heat them up to a very high degree and they wouldn't break down, right?

A: Straight chlorinated biphenyl properly produced would stable to a given temperature.

Q: And the temperature?

A: Six hundred degrees Fahrenheit, approximately. That's Therminols not Pydrauls.

Q: But the Pydrauls that had the Aroclors had some of these properties in them, as well, did they not?

A: No, there were other components in the Pydrauls that would make them less than stable.

Q: Phosphate ester?

A: As an example.

Q: The products we discussed that would not burn easily, they're fire resistant?

A: That's correct.

Q: What other qualities did they have that as a person with product responsibility you would be able to discuss with the potential user, talking about the early 60's?

MR. PECK: I object to being vague when you say what other products. I mean, there are numerous products.

Q: Pydrauls in particular.

A: In the case of Pydrual AC it had to be an adequate lubricant.

Q: Lubricity, is that the word?

A: Yes.

Q: Even though there were, to be an adequate lubricant it would have to be heat resistant, as well, isn't that correct?

A: It would have to be resistant to the environment in which it was used. How hot, it didn't have to go to heat transfer type of temperatures.

Q: But hotter than you might normally expect in outside, for example? Air compressors may go to 100

degrees, 150 degrees internal temperatures, is that not correct?

A: I don't know a temperature but I wouldn't dispute they could go to 100 degrees. You're talking about Fahrenheit?

Q: Right.

A: I wouldn't doubt that at all. Water cools, air cools -- I really don't recall the design that well, but, yes, they would be hotter because of the compression itself is going to be hotter than the air outside.

Q: So they wouldn't breakdown in the normal weather you would experience walking around every day?

A: I don't think that question can be answered. Air and water --

Q: Normally every day, if it's 100 degrees Fahrenheit it's very hot, and these fluids were designed to withstand temperatures in excess of what you would expect normally every day walking around in St. Louis or in North Carolina?

A: Sitting on a tabletop in the air with Pydraul AC will decompose but not to a measurable extent.

Q: It wouldn't vaporize very easily at room

temperatures, is that also correct?

A: Yes.

Q: Unlike water which would vaporize readily, if you put a cup of Pydrual AC on a table it would stay there, it wouldn't generally vaporize, right?

A: Yes. That's correct.

Q: And this was information that you were aware of certainly as early as 1960 when these letters were being written to Phillips Chemical and Air Products and these other companies, right?

A: I was aware it was fire resistant, it has a relatively low volatility, that sort of thing. I was aware of that.

MR. ROEDER: Why don't we break?

(Lunch Recess).

MR. ROEDER: Let's mark this as the next Exhibit.

(Plaintiff's Deposition Exhibit Number 390 was marked for identification)

Q: Sir, right before the break we were talking about the potential uses and basically the characteristics of the products that had PCB's that were beneficial in terms of their uses, the Pydrauls had lubricity, they were stable to a certain degree, and they have thermal stability, correct?

A: We were talking more about volatility and limited thermal stability is appropriate for the application there.

Q: They didn't burn, they were fire resistant?

A: Yes.

Q: They ultimately will burn though, is that correct?

A: That's correct.

Q: What degree approximately?

A: Depends on the droplet size. For example, steel will burn. It's not a matter of temperature as to temperature and particle size.

Q: Ultimately Monsanto built its own incinerator to handle PCB containing fluids, isn't that correct?

A: I know there was discussion about it. I don't recall if it was ever built.

Q: And those incinerators -- strike that.

The incinerator Monsanto did install would burn PCB containing fluids at temperatures in excess of 1000 degrees, isn't that correct?

A: As I said, I don't know the design. Logic says it would be well over 1000.

Q: Do you know whether the incinerator worked?

A: I don't know.

Q: Would Mr. Benignus be somebody who had a closer relationship with that issue?

A: I'm trying to remember when he retired.

Q: Approximately '73 to '74 he retired.

A: That would seem to be about the time they were talking about the incinerator. He knows more certainly, is somebody who knows more than I did.

Q: Now, Exhibit 390 is a memorandum from C. J. Eby to Howard Bergen dated October 23rd, 1961. You are carboned on it, is that correct?

A: That's correct.

Q: Along with Mr. Benignus and several other individuals. And this memorandum relates or discusses Dr. William Horwitz of the Food Division of the FDA who is hot on the trail of a chlorinated "compound X". Did you review this memorandum, sir, in preparation for your testimony here today?

A: Yes.

Q: Were you aware of a compound X issue as it developed in 1961?

A: No, I was not aware of that.

Q: But you would have received this memorandum in the ordinary course, correct?

A: Yes.

Q: Horwitz who is the doctor from the food

division of the FDA, the Food and Drug Administration, was investigating the use of Aroclor as "extendors" for insecticides?

A: Yes.

Q: You were aware of that use, were you not?

A: I had heard of that.

Q: Did that raise any concerns in you mind that the Aroclors may be used as extendors in insecticides?

A: No, I was, this was very far afield from what I was involved with. I had heard of it and I think it was something that had gone on some years before. So I had no concern because I knew nothing of the application.

Q: Well, the potential investigation by the Food and Drug Administration as of 1961 into whether or not Aroclors could be a "compound X" that was a causative factor in chick edema?

A: Correct.

Q: That was a concern that you would have shared at Monsanto at the time, is it not?

A: I don't think so. As I remember this application was not chlorinated biphenyls. It was chlorinated terphenyls or chlorophenyls or something and had nothing to do with products I was selling.

Q: What's the between the difference between a chlorinated terphenyl and a chlorinated biphenyl?

A: A chlorinated terphenyl is a larger molecule, has three rings instead of two, is a different chemical compound.

Q: Made out of the same chemical components, though?

A: Carbon, hydrogen, chlorine. So is chloroform.

Q: But chloroform as the way it is put together, sir, readily decomposes in the environment, is that not correct?

A: I don't think it decomposes but it has certain toxicity.

Q: If there's chloroform it's a gas, what happens to the chloroform in your experience that's released into the environment?

A: It evaporates.

Q: It evaporates. Readily?

A: Yes.

Q: And we've already established that doesn't happen through PCB's as you understand it, right?

A: Not readily.

Q: You would have to heat it at a very high temperature, for example, to have any PCB's

evaporate into the environment, correct?

A: Any, any significant amount is correct.

Q: You're using your own term. Just so we're on the same page, what do you mean by a significant amount?

MR. PECK: Actually I think the witness was responding to your use of the term.

MR. ROEDER: I'm trying to find out what he means when he says significant.

Q: When a PCB containing fluid is heated, as you described it, it would not be a significant amount of evaporization, what's significant in your mind as you used it in your previous answer?

A: What I had in mind is that everything evaporates. This table evaporates but that is not a significant amount of vapor. So PCB's evaporate more readily than this table but at room temperature it would be awfully hard, I would image, to measure what's coming off. I'm not sure what you're --

Q: How quickly do PCB's evaporate?

A: Very slowly.

Q: Ten years, 15 years, has there been any estimates that you're aware of as to how quickly PCB's would evaporate at room temperature?

MR. PECK: Objection to the question being

vague.

Q: Let's just say PCB's in Pydrauls, how quickly would the Pydraul fluids you were familiar with as a product specialist evaporate?

MR. PECK: Same objection.

A: Very slowly. Very slowly. I can't quantify that.

Q: Well, would it take more than a year for a cup of Pydraul sitting on this table to evaporate?

A: I can only give you a technical guess. "Yes".

Q: Would your technical guess take more than five years?

A: I can't, you're beyond my realm of guessing. Things involved in vaporization are the vapor pressure of the material, the diffusion constants which means how fast is the air blowing over it so that you can clear the air and more can evaporate. When the air is saturated with the material it no longer evaporates. If I understood what you were trying to find out I could answer you more intelligently.

Q: At the time you were, had product responsiblity for the Pydraul you had access to information that would indicate how quickly Pydrauls

would evaporate, didn't you, or is this something Monsanto even tested for?

A: We knew the vapor pressure. If you want to talk about how fast something evaporates you have to tell me, and I still couldn't answer it, how large is the container, what temperature things are at? It's relatively nonvolatile. I feel comfortable saying that. Compared to water it's nonvolatile.

Q: And compared to the ability of this oak table in front of us to evapporate it's relatively nonvolatile as well, correct?

MR. PECK: Objection. It's a mischaracterization of his testimony. His testimony is it would evaporate more quickly than this table.

MR. ROEDER: I don't think it mischaracterizes his testimony. Do you want the question read back?

MR. PECK: You're statement was it would be relatively nonvolatile compared to this table and his testimony was the opposite.

Q: So the table would evapporate more quickly in your mind than a cup of Pydraul?

A: More slowly than a cup of Pydraul.

Q: You can't tell us how quickly?

A: That's correct.

Q: You knew, did you not, sir, as of 1961, the date of this memorandum to Mr. Bergen, that Aroclors and PCB's were, in fact, toxic and had a toxicity level, did you not?

A: That's two different questions. Everything has a toxicity level including distilled water and were they toxic, all the information from the medical department coming to me at the time is they were relatively nontoxic, that their toxicity was similar to that of petroleum oil.

Q: You can't drink petroleum oil, can you?

A: Cannot you say?

Q: Right.

A: Of course you can drink petroleum oil. In very minute quantities. People take mineral water and that's a medication.

Q: Well, you've never taken Aroclor as a medication, have you, sir?

A: No.

Q: You wouldn't recommend it, would you?

A: No.

Q: Was it your expectation, sir, in reviewing the memorandum, the letters to Mr. Hooper and other customers that we've looked at this morning, that -- strike that.

In reviewing these documents is it fair to say Monsanto was telling its customers that if PCB's get into the water they would sink to the bottom?

A: If they're not emulsified, right.

Q: And if they're not emulsified and sink to the bottom they could pose a danger to aquatic life?

A: What I recall seeing in these memorandum was that if it was assumed that if sufficient material settled to the bottom of the stream on top of aquatic life it could have an effect and I would expect that statement to be made for any chemistry that was in water. You can't expect a plant to grow in an, underwater plant to grow when you cover it with something.

Q: Sir, you knew it would be toxic, you just didn't know to what extent it would be toxic?

A: No, I don't know if they were referring to chemical toxicity or smothering of the plant.

Q: You can't tell by looking at this?

A: Let's look at what you're asking about.

Q: For example, Plaintiff's Exhibit 383, there's a 1 or 2 percent emulsion, that was discussed here?

A: Yes.

Q "We feel that it is possible for this

material or any other emulsified organic material to cause damage to plants such as grass, shrubs, et cetera, if the materials are sprayed directly on the plants and shrubs repeatedly for some length of time", you agree with that statement, right?

A: It's a logical statement to me.

Q: Do you agree with it?

A: That it is possible for this or any organic material to cause damage to plants, do I agree with it? It's logical to me. I wouldn't go so far as to say I agree or disagree. It's perfectly logical something that breaths air cannot be covered with an organic material.

Q: Monsanto could, could have in this time performed its own tests to determine how toxic and what concentrations this would be toxic to plants, is that not correct?

A: Could have tested? If they had sufficient information to be able to run the tests probably I guess they could have run the tests.

Q: What additional information would they need to run the tests?

A: The kinds of things that they talked about in the documents. That's not my area of expertise.

Q: I understand that but as the person who was

the go between between the medical department and the sales department don't you recognize that if Monsanto had wanted to perform a test supervised by the medical department or whoever where they would take a concentration of Pydraul AC and spray it on plants they would be able to have some test data that would indicate in what concentrations Pydraul AC was toxic to those plants? They don't need that information from the customer, do they?

A: I think to be meaningful they need to find out what the customer application is and duplicate it and measure the results.

Q: Well, when as we see there is a discussion in the letter with respect to the potential toxicity of Pydraul AC for fish, Monsanto could have fashioned its own tests, couldn't it, defined its own parameters and decided if X amount of Pydraul AC were released into the water and could see what effect it would have on species of fish?

A: What I read in this memo is there's insufficient data. They needed to know discharge, what quantity of water, what flow of water so that it's not just what's being put in but what is it going into.

Q: But that's for that individual plant,

correct, sir? I'm talking about in general.

A: They did animal toxicity studies and they're recited in the documents that you showed me.

Q: They sprayed some for six hours?

A: No, we're talking about -- are you talking about plants or fish?

Q: Either one. Or we've already examined or discussed the fish, you said that wouldn't be meaningful and you needed more information?

MR. PECK: Objection. That mischaracterizes his testimony.

MR. ROEDER: The record will show what the witness said.

MR. PECK: The record will show what the document said and a request was made to the customer to perform the test.

MR. ROEDER: The record will show what the record will show, Counselor, and I don't think you need to suggest answers to the witness.

MR. PECK: I'm not suggesting any answers but when there's mischaracterization of documents we've already discussed I feel it it appropriate to say so.

MR. ROEDER: The rules are clear what the objections can be.

Q: Monsanto could have fashioned its own test without regard to a particular customer, sir, could it not, that would indicate on a particular species of fish, for example, what concentrations of Pydraul AC released in that water would be lethal to that fish?

MR. PECK: Objection to the hypothetical nature of the question. It's just a technical objection. You can answer.

A: Monsanto did run tests and documented in what you've shown me here that showed the lethal dosage of each of these products on rats and this was common technology for studying toxicology, any material. Now we're talking about fish. What fish, what levels, and so forth? Given the information, let's take a six month old trout and feed it Pydraul AC until 50 percent of the trout die, that, if we were asked to do that we could do that.

Q: And Monsanto could have done its own testing with respect to shrimp, for example?

MR. PECK: Objection as to the hypothetical nature of the question.

Q: The effect of, the release of Pydraul AC on the shrimp population, they could have done those tests?

A: The answer is the same as before. We did it on rats and probably other animals. If we were asked to feed, to expose shrimp to a given product up to the point where 50 percent of them died we would have a number. We could have done that test.

Q: Why would Monsanto have to be asked to do that test?

A: Why would they have to be asked to do that test? Because one could test everything in every way, exposure to everything with no relevance to 99 percent of it. So we wait until there is a need.

Q: You would, the practice of Monsanto was to wait until someone asked them to do the test?

MR. PECK: Objection. It's not only argumentative but mischaracterizes his testimony.

MR. ROEDER: You can answer the question.

A: There is no end to the questions that might be asked and one could spend forever testing the toxicity on various vegetables, on various animals, four-legged, two-legged. So typically you do those things which are relative, the customer has an application and says what is the effect of Pydrual AC on breathing air, we'll look at that issue. What is the effect of Pydraul on a fish, we'll try and look at that issue.

Q: The Exhibit 390 that we're looking at, Plaintiff's Exhibit 390, the FDA, Aroclor issue, October 23rd, 1961 is the date of that memorandum, sir, did Monsanto perform any tests with respect to the, the effect that Aroclor 1242 may have for chickens and whether such could cause chick edema?

A: I don't know if such tests were run.

Q: Did you ask that any such tests be run yourself?

A: Not that I recall.

Q: This is a specific inquiry, sir, is it not, that Monsanto is aware of that the FDA is looking into this issue, correct?

A: In paint, yeah.

Q: So as you understand it would this be a sufficient basis for Monsanto to then examine -- strike that. I'm going to rephrase the question.

MR. PECK: I'm going to object.

MR. ROEDER: There's no question pending so there's objection called for at this point.

MR. PECK: The document speaks for itself as to the issue of the 1242 and whether or not tests were conducted but if you want to pull portions out and mischaracterize the document I'll just have to state for the record that's being done but if we

read further we may have an answer to your question.

MR. ROEDER: We may or may not. There's no question pending so there's no reason for an objection.

Q: Would this be sufficient in your mind for Monsanto to investigate the effect that Aroclor 1242 would have with respect to chick edema?

A: You're asking me to speak for Monsanto. Speaking for myself I had nothing to do with the application of Aroclor in paint so this doesn't relate to me or anything I ever did in Monsanto. Are you asking me to speculate what the corporate entity would do?

Q: No, what I'm trying to figure out, sir, if it doesn't relate to you why are you sent a copy of it?

A: You have to ask Mr. Eby. I was involved with products that contained Aroclor 42 but had nothing to do with the use of Aroclor in paint. He may have carboned me in as a courtesy because I had interest in that chemistry for other uses.

(Plaintiff's Deposition Exhibit Number 391 was marked for identification).

MR. PECK: Is this document in any way different from Exhibit 380?

MR. ROEDER: It is the same one. Let's just go back to 380.

Q: Sir, 380 which you have in front of you, states on the fourth paragraph "Based on the toxicity studies of these fluids with laboratory animals I would not expect them to be very toxic to aquatic life." This is the letter to Mr. Facini at Chicago Pneumatic Tool. "On the other hand, this is a surmise on my part since we have no tests on aquatic animals". It is your testimony Monsanto would not perform any tests on aquatic animals unless and until they had gotten a request from the customer?

A: I think that would be an incomplete statement.

Q: When would Monsanto perform tests on aquatic animals, what would be a complete statement in your view?

A: In addition to a specific customer request if there were reason for us to anticipate that this was -- let me think that through. I think what I found your question was restrictive, Monsanto wouldn't act unless a customer asked them to. We did a certain amount of toxicity studies on every product anticipating, based on technology at the

time, anticipating things that would need to be known. Then as we began to commercialize the product other applications come to mind, et cetera so that generally it was a customer alerting us to something but I wouldn't restrict the answer to that, that we never responded to a customer demand. It doesn't feel like the way we operate.

Q: Well, your answer encompassed a couple of things I would like to follow-up, sir. You said based on the technology at the time. You included that in your answer. What was the technology that you were aware of that you would use in connection with testing, that would be used by Monsanto in connection with the testing of PCB containing fluids?

A: What was the technology?

MR. PECK: I object as being grossly broad. If you understand the question and can answer it, go ahead.

MR. ROEDER: That was part of his answer.

A: I can only give examples. Two come to mind. One is if someone were looking for a product present in a parts per billion level, at that time that technology didn't exist.

Q: Early 1960's?

A: Yeah. Another thing that would come to mind is, is the ecological factors involved in the product. It was not, to my knowledge it was not really state of the art in the 60's. It was just coming into being.

Q: Well, in the 60's you had gas chromatographs at this time?

A: I think they were there at that time.

Q: Well, how did -- we looked earlier at what Sloan Kettering was using.

A: What document are you looking at?

Q: 375. They were finding 0.2 to 0.3 parts per million with respect to Aroclor, how would that vapor be analyzed, what would be the machine or testing mechanism by which that would be analyzed?

A: A gas chromatograph is something that separates things and I'm not familiar enough -- first of all, I don't recall it says gas chromatograph. I know they existed but I don't know when they came into existence. They were within my industrial lifetime. Are you asking how would they have measured parts per million? I don't know.

Q: Did Monsanto perform any fade analyses?

A: I'm not familiar with that term.

Q: Are you familiar with mass spectrometers?

A: I've heard of them.

Q: What are they?

A: I got to answer you I think a mass spectrometer did something to the chemical which then gave an imprint or wave length to characterize the product and bring it to bear against the standard. I don't know.

Q: Is that what they're referring to in Exhibit 390?

A: Where are you?

Q: Second paragraph when Horwitz calls back "This week indicating that the FDA might like to know all about our Aroclor process of manufacture, our methods of analysis including chromatographic." Is that related to gas chromatography?

A: Well, it's chromatography. Whether it's gas or liquid, I don't know. So this infers chromatographic equipment existed in 1961. That's something I wasn't really up-to-date on.

Q: Well, when you left the Krummrich Plant you were in a technical capacity?

A: Yes.

Q: Were you in pure research?

A: No.

Q: You indicated you were sort of functioning,

I take it, as an industrial engineer in certain respects to make sure the manufacturing, to assist in manufacturing?

A: Yes. Industrial engineer is not correct. I was involved first in chemical laboratories doing very simple analyses on products that were being produced, quality of finished products. And then I did some process engineering related to the chemical processes we were using to see if I could improve them in any way and then I did some manufacturing supervision.

Q: Were you working in Pydrauls at this point?

A: No.

Q: You didn't get to Pydrauls until '56?

A: That's correct.

MR. ROEDER: Let's make this Exhibit 391. I'll take the sticker that has been previously marked and put it on here.

Q: Just so the record is clear, sir, Exhibit 391 is your, is a memorandum to you from J. D. Wright which, in fact, resulted -- first of all, that is a memorandum to you from Mr. J. D. Wright?

A: Yes.

Q: It appears to be dated August 18, 1960, TNGS 18582 Bates production number and this is the

memorandum that resulted in Plaintiff's Exhibit 380, isn't it, sir?

MR. PECK: I'll object to the form of the question but you can answer.

A: Exhibit 380 is a letter to Mr. Facini from our industrial hygienist. 391 is a memo from Jim Wright to me regarding the same company.

Q: And the date on the Jim Wright memo to you is August 18, 1960?

A: Yes.

Q: The date on the letter to Mr. Facini is August 29, 1960?

A: Correct.

Q: So this is Monsanto's response to Chicago Pneumatic Tool Company's request for advice on the safe disposal of Pydraul fluids, correct?

A: Yes.

Q: I would like to show you another letter to that same company.

(Plaintiff's Deposition Exhibit Number 392 was marked for identification)

Q: Exhibit 392 is your letter to Mr. J. R. Rowland at Charles Pfiser and Company and is dated November 17, 1961, correct?

A: Correct.

Q: And this relates to a Chicago Pneumatic air compressor and the question a customer had with respect to compatibility of Pydraul AC with another lubricating oil that was being used in that compressor, correct?

MR. PECK: Object to the form of the question. The document speaks for itself. The objection is to any characterization.

Q: You wrote to Mr. Rowland "Pydraul AC is compatible with Gulf harmony 69 and leakage of Pydraul AC into this oil would form a true solution with satisfactory lubricating properties." What did you mean by the term true solution?

A: One dissolves and the other is emulsified.

Q: Emulsified solution, they are not dissolved but readily split apart, is that fair to say?

A: Emulsion means a droplet of one liquid contained within another liquid. Whether or not it separates depends on other things. You can make emulsions that never separate, you can make emulsions that separate. Like milk, you used to have to shake a bottle of milk to emulsify the cream. Now you don't, it's permanently emulsified.

Q: You're not suggesting PCB's are like milk, are you, sir?

A: No.

MR. PECK: Objection. Come on.

Q: Again there was a question as to the carry-over of air compressor cylinder lubricant filters. Have you, what did you mean by the carry-over with respect to that? I'm looking at the first paragraph on the second page.

A: Carry-over refers to the lubricant on the cylinder wall of an air compressor carrying out of the compressor in the air.

Q: That the air compressor compresses?

A: That's correct.

Q: That's known as a carry-over effect?

A: It's commonly called carry-over.

Q: And that's what you understood when you wrote this letter in '61, correct?

A: That's a long time ago but it would seem so, yes.

Q: It's a well known principal on the air compressor with respect on air compressors, is it not?

A: That some lubricant carriers through, carries forward?

Q: Right.

A: Yes.

Q: Had you ever suggested, sir, to people who used air compressors that they use filters to trap any PCB's before they were continued -- strike that, before the PCB's were emitted from the air compressors?

MR. PECK: Referring to this document?

MR. ROEDER: Just in general.

A: I remember conversations with Monsanto's Brink midst eliminator people about the possibility of using brake midst eliminators in applications where no lubricant at all was warranted in the effluent air.

Q: What became of those discussions?

A: We did not attempt to commercialize a combination of Brink midst eliminators of Pydraul AC or any lubricant.

Q: Why not?

A: The customer had the option of buying non-lubricated compressors that didn't require liquid lubrication. So there was a way to create that type of air if the customer wanted it.

Q: When did you have these discussions, sir?

A: I don't remember but this memo suggests it was going on at this time in 1961.

Q: Was the issue of filters with respect to

vapors for this carry-over effect, was it every formalized in any sales brochures related to Pydrual AC? Do you understand my question?

A: No, I don't.

Q: Let me rephrase it this way.

Did Monsanto ever make any formal recommendation in sales brochures its customers use filters in connection with the use of Pydraul AC?

A: I don't recall that it was.

Q: Did you have any discussions concerning that issue, whether the filter recommendation should be included in the pamphlets or brochures relating to Pydraul AC?

A: I don't remember having that discussion.

Q: In you mind was it a significant issue that was worthy of considering and not putting or putting in any of these brochures?

A: I would like to say "no" and explain that. Lubricated air compressor systems were very similar whether they used petroleum lubricants or synthetic lubricants such as Pydraul AC. The filters don't remove vapors, they just remove midst. That the customers, the people who made air compressors typically included things to catch the condensate water. They provided filters where the customer had

a need for filters and the use of Pydraul AC instead of petroleum oil is not a great difference unless there was something to consider such as breathing air. Therefore, it was, not to my knowledge, filtration was not put into our literature to the best of my knowledge.

Q: Were you the person who had responsibility for approving literature?

A: One of them.

Q: Did you draft any of the literature yourself?

A: On Pydrauls? I certainly had input to the commercial statements and some of the use statements. Whether I wrote or instructed someone what to put in there I don't remember.

Q: Now, your last answer you refer to the fact that air compressor manufacturers would have some mechanism to trap condensates, did I understand you?

A: That's common, yes.

Q: Did Monsanto make any recommendations to customers that they should put -- strike that. Let me go back.

You were aware, were you not, sir, that users of air compressors would from time to time blow the system out, do you understand that term?

A: No, I don't.

Q: Were you aware, sir, that users of air compressors would drain the condensates on the system?

A: Yes.

Q: That's the reason you trap them then you can remove them from the system?

A: Yes.

Q: You were also aware, were you not, sir, in removing those condensates users would take additional air and blow it through the system to make sure all the condensates were --

A: I wasn't aware then but I was aware of the contrary. It's new information.

Q: With respect to the use of Pydraul AC did you undertake any analysis yourself as to how customers actually used the air compressors to insure that your product was properly used?

A: Would you restate that?

Q: Sure. You had product responsibility for Pydraul AC, correct?

A: Correct.

Q: In discharging your responsibilities didn't you want to understand how the customers were using the air compressors to insure that the Pydraul AC

would be used properly?

A: In a general sense, yes. We were offering a product for commercial use with recommendations for its use and if a customer chose to buy it and use it for something else we had no way to police that. Of course, nor did we refuse to sell it to a customer if they gave us all the information.

Q: The recommendations for its use were contained in the Pydraul AC book?

A: That is correct.

Q: And if someone wanted to know the sum and substance of Monsanto's recommendations with respect to Pydraul AC they would look at the book?

A: Look at the book and if their particular application were not adequately described they would usually contact us and we would get into the kind of correspondence you presented here today.

Q: Whether or not people could breath air that was compressed?

A: Yes.

Q: And Monsanto's view was that people could?

A: Under the conditions stated in these memos, yes.

(Plaintiff's Deposition Exhibit Number 393 was marked for identification)

Q: Exhibit 393, sir, is a salesman's call report from Mr. Harry Ditty directed to you, correct?

A: His note is directed towards me, yes, that's correct.

Q: To the attention of Dick Davis and that's listed in the routing of the check boxes at the top and also in the text of the document?

A: Yes.

Q: Mr. Ditty was a salesman out of Monsanto's Wilmington, Deleware office?

A: That's correct.

Q: And it reflects conversations he had with the industrial hygienist at Reynolds Metals Company in Richmond, Virginia, correct?

A: I think Mr. McClean was the hygienist, I'm not sure if Mr. Mansur was --

Q: Does it not say contacted Mr. Richard Mansur, industrial hygienist?

A: Correct. It does.

Q: Now, as of -- the date of this is 4/28/65, correct, sir?

A: Yes.

Q: And production number for the record TNGS 18700. Mr. Ditty writes you, this is toward

the middle of the document, "Now that he has developed a standard, and this relates to Pydraul AC, Mr. Mansur is having difficulty in actually measuring an atmosphere to see whether it conforms to this standard. He has reviewed the work which was sponsored by Monsanto and others and found it either to be unsatisfactory or impractical for Reynolds use." Did I read that correctly?

A: Yes, you did.

Q: Let's stop right there. Were you aware of customers other than Reynolds Company who had determined that the work sponsored by Monsanto was unsatisfactory or impractical for them to use?

A: No.

Q: Continuing, "Mr. Mansur is now doing some experimental gas chromatography work. Mr. Mansur was quick to point out that setting base standards for the use of fire resistant lubricant is the responsibility of Dr. McClean."

Did Monsanto have its own gas chromatograph at this time for which they could do their own experimental work?

A: I don't actually know.

Q: Was it surprising that a customer would tell you they were going to do their own chromatography?

A: No.

Q: It was well known in the industry?

A: As I said, I don't remember when the gas chromatography became common. We found in an earlier document chromatography existed in 1961 and a customer has a gas chromatograph in 1965, it doesn't surprise me.

Q: Let me continue further. "When I asked Mr. Master whether or not Pydraul AC is under active consideration at this time he said that Dr. McClean is rather hesitant to go very far with Pydraul AC due to his own bad experiences with high molecular weight chlorinated hydrocarbons. For himself, I believe that Mr. Mansur is open on whichever material is chosen. He said that any system will have to be watched like a hawk. Mr. Mansur expresses great respect for our hygiene people concerning Pydraul AC but he said any man-made system can go out of wack." Did I read that correctly?

A: Yes.

Q: Were you aware of any customers who also had bad experiences with high molecular weight chlorinated hydrocarbons?

A: I don't know what kind of chlorinated

hydrocarbons or what problem he's talking about. I can't really answer that. I would add that my surmise from this is he was talking about chlorinated petroleum oils which were known to have some toxicological problems totally unrelated to chlorinated biphenyls because there's a difference in stability.

Q: So your guess in looking at this is this refers to chlorinated petroleum products?

A: Yes.

Q: Would be more stable or less stable than PCB containing products?

A: Less. They would be familiar to the metal industry such as Reynolds.

Q: Did you ever meet anyone from Reynolds Metals Company with respect to this issue?

A: Not that I recall.

Q: Did Reynolds ever purchase Pydraul AC from you?

A: I don't recall.

Q: Is Exhibit 393 a document you looked at in preparation for your testimony today?

A: Yes, it was.

(Plaintiff's Deposition Exhibit Number 394 was marked for identification)

Q: Exhibit 394, sir, is a memorandum from Elmer Wheeler to Mr. Larry Bradford dated July 30, 1965. You received a copy of this document, did you not?

A: This indicates one was sent to me. I presume I received it.

Q: And the first paragraph references the reference bulletin, which would be a bulletin that Monsanto would publish with respect to its products, is that not correct?

A: It appears like that to me. I don't see a reference to what bulletin he's talking about.

Q: Mr. Bradford had responsibilities for Pydrauls, did he not?

A: I don't remember his assignment in that this memo suggests that indeed he did.

Q: The handling and storage, the first paragraph beneath there references Pydraul hydraulic fluids, correct?

A: That's correct.

Q: So this would be a reference with respect to Pydraul hydraulic fluids?

A: It appears to be, yes.

Q: The last paragraph from Mr. Wheeler to Mr. Bradford says "Respiratory protection or mechanical exhaust ventilation should be provided if there is

repeated and prolonged contact of the fluid with heated surfaces with resulting volatilization or possible decomposition of fluid." Do you see that?

A: Yes, I do.

Q: What's he referring to, sir?

A: Pydraul hydraulic fluids were used in hydraulic equipment where there was a heat source around, thus a fire hazard and typically he would be referring to Pydraul hydraulic fluid leaking onto or spraying onto this hot surface and large quantities evaporating or decomposing into chemicals.

Q: So if it was very hot it would midst up?

A: Midst up is not the correct term.

Q: What does the term volatilization suggest?

A: Evaporization.

Q: I guess that's what I was using the term midst up to mean. I'm sorry for using the imprecise term. It continues "For short periods such might arise in turning off equipment following the rupture of a hydraulic line or other mechanical failure no such protection is necessary." Was that your opinion, as well, at the time, sir?

A: Again, that's, we're talking about medical or hygiene people talking about medical and hygiene matters and I never second guessed them.

Q: But you never, you never disputed the fact or their conclusion that someone would not need to have protection?

A: For short-term exposure.

Q: Or might arise in turning off equipment following the rupture of a hydraulic line?

A: I had no reason to disagree with that.

(Plaintiff's Deposition Exhibit Number 395 was marked for identification)

Q: Exhibit 395, sir, production number TGNS 17683 to 17684 relates to a request for information given or made to Monsanto by someone who is seeking information on air quality standards for scuba diving, correct?

A: Correct.

Q: And there would be compressed air that would be put into a tank that someone would go under water and breath?

A: That's my understanding.

Q: Okay. The second page of this memorandum, sir, and just so the record is clear this is a memorandum that's in response to a letter you received from, you received from Randall Graham from New York who is a Monsanto employee there, correct?

MR. PECK: Objection. Mischaracterization.

But you can answer.

A: I don't know. It mentions Dale Smith.

Q: Well, the reference is your letter of February 16 to Dick Davis, right, that's you?

A: Where are you looking?

Q: (Indicating) that's you, right?

A: That's me.

Q: So Mr. Graham would have written you a letter asking you information with respect to the inquiry from this guy in Bermuda?

A: Right.

Q: Who has a diving school, right?

A: Yes.

Q: Second page of the memorandum, sir, Mr. Wheeler writes "Getting back to the question of use of Pydraul we feel that the hazard is no greater with this lubricant than with an oil lubricant. We have limited data on one compressor at the Queeny Plant where analysis of samples showed no significant contamination in air lines down-stream from the compressor", that's what Mr. Wheeler wrote then?

A: Yes.

Q: That's the same report we discussed with respect to the 1961 memorandum you wrote?

A: I would expect it is.

Q "Considerable more sampling, Mr. Wheeler writes, would have to be done, however, with many makes of compressors, sizes conditions of wear, et cetera." So that's what Mr. Wheeler wrote there, as well?

A: Yes.

Q: After you received this memorandum, sir, did you request any additional research be done with respect to the use of Pydraul AC?

A: I don't recall.

Q: You don't recall?

A: No.

Q: Now, this is now 1966, this memorandum we're looking at, sir, we looked at a number of exhibits that discussed the potential use of Pydraul AC in air compressors that individuals would breath and you seen those this morning?

A: Yes.

Q: We discussed the thermal stability of PCB products, you recall that testimony, right?

A: Yes. There was some confusion around that in that they were formulated products containing more than PCB's.

Q: We discussed the fire resistance?

A: Yes.

Q: We discussed the fact that if Pydraul AC were released into the water and were not emulsified it would settle on the bottom and stay there, right?

A: Yes.

Q: We discussed the fact it may cause a danger to fish populations and Monsanto is aware of the possibility as early as 1960 in the documents we looked at, do you recall?

A: Whatever the documents said I recall the issue came up asking the toxicity around fish. I have forgetten whether they arrived at a conclusion.

Q: But the issue was raised. You recall that as of 1961 the issue was raised with respect to chick edema and whether or not Aroclor 1242 would have any effect on that, correct?

A: Yes.

Q: Now, in light of that when was the first time you became aware, sir, specifically of the ecological risks that PCB's caused to the environment?

A: Again, as I said, I don't recall the exact date. I believe it to be in the late 1960's in which a report came to our attention regarding the ecological significance, more specifically peregrine

falcon egg shells were thin for some reason and it was suggested that chlorinated biphenyl, chlorinated biphenyls and they were talking about it earlier, may have been involved. That's our first alert to that.

Q: Your personal first alert?

A: My personal first alert, true.

Q: That was an incident related to birds in the Pacific?

A: I don't remember where they were.

Q: Irish sea coast?

A: I don't remember that.

Q: Did you expect that Dr. Kelly would keep you advised of concerns he had relating to PCB's in the environment?

A: Any significant things I would think he would inform me.

Q: How often would you discuss issues relating to PCB's with Dr. Kelly?

A: Very very rare. He was the head of the medical department. There were industrial hygienists with whom I chatted occasionally and in the later years again as we talked about the peregrine falcon issue it was Bill Richard who was the focal point.

Q: By that time the medical department or the research department had kind of restructured, is that not correct?

A: That I don't remember.

Q: Do you recall if Mr. Richard was in charge of research for functional fluids?

A: Dr. Richard, yes, he was.

Q: Were you made aware of the findings of Jensen and Widmark in Sweden with respect to the persistence of PCB's in the environment?

A: I can't be specific to that reference to PCB's in the environment but that was an issue that was brought to our attention that we considered.

Q: When you first became aware of the PCB issue in the environment and its persistence in the environment, how did you become aware of, did someone tell you, did you get a memorandum?

A: It was a staff meeting in which Dr. Richard informed the other people in the functional fluid business group management there was a potential issue here. We had to follow-up and look into it. It was a meeting.

Q: Was a staff meeting held regularly?

A: Yes.

Q: On a weekly basis?

A: Yes.

Q: What was your reaction when Dr. Richard made this announcement?

A: Significant interest and a desire to follow it with Bill Richard.

Q: Let me point a reference here.

Did Dr. Kelly ever tell you he accepted the findings of researchers that indicated that PCB's would persist in the environment as early as the middle of 1967?

A: I would not have had direct communication with Dr. Kelly on that issue. I remember Bill Richard, whether it was '67 or '68 is not in my memory.

Q: Have you discussed any issues related to PCB's with David Wood? Do you know who David Wood is?

A: I don't remember that I did. I remember David Wood, I remember him being in Brazil, somewhere in South America, and my dealings with him had to do with things other than PCB's.

Q: How about Cumming Paton, did you ever discuss PCB's with Dr. Paton?

A: I'll give you a probably there in that for a point in time we had some relationship. I don't

know if I reported to him or we had parallel jobs that related to functional fluids. So I would have had conversations with him. I don't remember any particular Aroclor issue.

Q: Does it refresh your recollection to suggest that Dr. Paton had product responsibility for plasticizers at about the time you had product responsibility for functional fluids, does that sounds correct to you?

A: He was involved with plasticizers at that point in time as I remember.

Q: When you became aware of this PCB environmental issue what did you do with respect to the interest that peaked in you, when you became interested in the issue what did you do?

A: I stayed in contact with Dr. Richard through the weekly staff meetings or through our frequent contacts working in the same business group. We had a very good relationship so that I felt comfortable talking with him or listening to him about what's going on, what does all this mean, what do we do about it. It was in his hands but with my interest because there was some products I was involved in selling. And I remember it not being terribly long because this must have been near the end of my

Pydraul responsibilities.

Q: And your Pydraul responsibilities continued until when?

A: 1968, '68, '69.

Q: But you continued Therminol until at least '72, correct, sir?

A: Yes.

Q: And I didn't -- did you give up Pydrauls, I don't recall your testimony?

A: There was an overlap period. I had Pydrauls and I had Pydrauls plus Therminols and I had Therminol and other things but not Pydrual.

Q: If you testified to that then I missed it. When did you give your responsibilities with respect to Pydraul?

A: As best I remember it was 1968, maybe '69.

Q: So as of '69 and the outside you're no longer involved in the Pydraul area at all?

A: That's my remembrance of it, yes.

Q: When you had kept in touch with Dr. Richard on this issue did he tell you when he first learned of the PCB environmental problem?

A: Again it goes back to that staff meeting and I'm not sure of the date. I'm guessing it would be 1968 when he first informed me and all others about

the issue. I think he just received that information.

Q: And you're able to fix at least 1968 because that's the time you think you had last responsibility for the Pydrauls?

MR. PECK: I object as far as him being able to fix the date. My understanding he was able to fix it with this staff meeting but he just testified he was guessing as to the date of that meeting.

Q: Can you answer the question?

A: Restate the question.

MR. ROEDER: Can you repeat it?

(The reporter read the record as requested)

A: No, the dates are coming out about the same. I remember the staff meeting. I'm guessing at the 1968. I am aware that the issue surfaced shortly before I left Pydraul responsibility but I can't pull the two together absolutely.

Q: Okay. When you got into the Therminol area as you -- who was your successor in the Pydraul area?

A: That's what I'm trying to remember. I don't remember. I think I stated early it might have been Rollie Garcia but in some document here suggested it was Larry Bradford but I don't remember which it

was.

Q: Okay. Did Mr. Bradford at some point take the responsibility that you had, I'm not saying he was your immediate successor, I'm wondering who had that product responsibility after you had it?

A: My memory is Rollie Garcia. It sounds like, you know, as far as Larry Bradford is concerned I should know him but I don't. I was probably gone from Pydraul when he was there.

Q: Well, let's mark this as the next exhibit.

(Plaintiff's Deposition Exhibit Number 396 was marked for identification)

Q: Exhibit 396 is a memorandum from Howard Bergen to Dr. Anagnostopoulos. Who was Dr. Anagnostopoulos?

A: You mean what was his position at this time?

Q: Exactly.

A: I remember him as a director level who came from research but at one time was involved at the director level over the fluids business. I can't be precise about his title.

Q: All right. Howard Bergen as of April 1968 was he in charge of the organic division?

A: No, functional fluids business as I recall.

Q: Okay. Mr. Menkler was in charge of the organic fluids?

A: That sounds correct.

Q: And later on Mr. Mason was the assistant to Mr. Menkler?

A: That I don't remember.

Q: In any event Mr. Bergen was directly or indirectly your boss, correct?

A: Correct.

Q: You are carboned on that document and you received it, didn't you?

A: I'm carboned on it and I assume I received it. I don't remember the document.

Q: The document reflects that the plants are running at approximately 99 percent of capacity as of April 5th, 1968. The sales were good as of that date, were they not?

A: I don't mean to be facetious. Either the production was small or the sales were great. But they were at 99 percent capacity.

Q: Certainly no one you knew of was objecting to the large or the efficient use of the plants at 99 percent capacity, correct?

A: No, that would be desirable.

Q: Did you have an understanding or belief as

of April 1968 that the plants were, in fact, running at capacity and the business was profitable?

A: I don't remember this issue that we were at 99 percent capacity even though I am indicated as receiving a copy. You mentioned profitability. I don't draw that conclusion from this. I have no reason to dispute but I don't draw that conclusion.

Q: In connection with that I'll show you a document that we've already marked. It's already been marked in another deposition. I think it's exhibit, earlier marked, Exhibit 10 or something like that. If you want me to mark this again I will.

It is 1970 total marketing plan, you would have received a copy of, on the second page?

A: Yes.

Q: Now, again this goes to the, just at issue with respect to the profits, if you look, sir, on page 1 of the document, production number TRAN 3763, talks about the sales, gross profit and gross profit as a percentage of the sales for the overall business worldwide, 49.6 percent gross profit as of 1964 and was budgeted as of 1968 shows a gross profit of 45 percent, do you see that?

A: Yes.

Q: Does this refresh your recollection as to its profitability?

A: Does it refresh my memory? I don't remember what these numbers were but I'm seeing them here and I don't dispute them, of course.

Q: And there's a budget as of 1970 of 41.3 percent of gross profit, do you see that as well?

A: Yes.

Q: In the memorandum from Mr. Bergen to Dr. Anagnostopoulos, did I say that correctly?

A: You did.

Q: There is attention to you and Paul Benignus on the second page to get samples of transformer Aroclor that General Electric used to determine whether there were usable or not.

MR. PECK: Point of clarification. You are using these documents that show the profitability of the fluids business which is not all chlorinated biphenyls. That's a mixed number.

Q: Tell you what, go to the next page, sir. This is gives an indication of the budget. If you want we can separate out the profitability with respect to each of the individual lines. I was trying to refresh your recollection as to its profitability. For example, as of 19, as

of 1968 --

MR. PECK: What page?

MR. ROEDER: Page 38.

Q: Industrial hydraulics, that relates to 1968 the products that you have responsibility for, does it not, sir?

A: Yes.

Q: Okay. And there you're showing a profitability or gross profit as a percentage of sales of 43.1 percent?

A: That's correct.

Q: Does that refresh your recollection with respect to profit with respect to those?

A: Same sort of thing. I have forgotten what those were.

Q: So your Pydraul line was relatively profitable at that time as well?

A: I had a gross profit level, that's correct.

Q: Now, as of April 1968, sir, were you concerned about the potential effect of PCB's continued business, Pydrauls?

MR. PECK: Objection as to the form.

MR. ROEDER: Sure. Let me restate it.

Q: Were you concerned that the PCB environmental issue could eat into the gross profits

Monsanto would make on the sale of its products?

A: First of all, the date remains fuzzy when I first learned about the ecological issue. I think it was 1968. Was it April 1968 I have no idea. When I learned that there was an ecological issue involved with chlorinated biphenyls my reaction was to find solutions to the problem rather than to look at, you know, did it mean we were going to lose profits.

For example, in the heat transfer business we had various chemistries of fluid and whether or not PCB's were in the line didn't foretell whether or not we would have a continued product line or be profitable. To some extent the same would be true for Pydrauls but that's more than you asked, I'm sorry. There was concern but -- period.

(Plaintiff's Deposition Exhibit Number 397 was marked for identification)

Q: Exhibit 397, sir, is a memorandum from Dr. Richard to you dated May 20th, 1968. Production number TRAN 57590 it says "We now have FDA inquiry for samples of Aroclor, presumably to look for ppm, parts per million, toxicity, and on residues in wildlife." Next sentence "Are we preparing ourselves and customers to minimize or prevent

process, stream and air pollution?" W. R. Richard, typed underneath. That's a memorandum you received May 20, 1968?

A: Yes.

Q: Does this refresh your recollection you learned about the PCB environmental pollution problem no later than May 20, 1968?

A: I would say that I was then aware it was an issue. It helps to set the date.

Q: Were you preparing yourselves and your customers to minimize or prevent process stream and air pollution as it relates to PCB's on May 20th, 1968?

A: Not yet but we apparently just learned there was an ecological issue to be considered.

Q: Would it surprise you to know that Monsanto was aware of this ecological issue for the later part of 1966?

A: Again I'm not sure of the date of that meeting when I first learned about it. If I learned about it two years later I might be surprised. If that was 1966 when the meeting occurred then it's no surprise. I don't have the information that you're referring to.

Q: Well, you certainly didn't take two years to

respond to the information you learned about, correct, sir, or year and a half?

A: That's correct.

Q: Had anyone told you prior to today that Monsanto was aware of the research relating to the PCB environmental problem as early as 1966?

A: Again, I'm still fuzzy on the date I learned about it. I'm guessing it to be '68. And your question again was?

MR. ROEDER: Could you read it back, Miss Court Reporter?

(The reporter read the record as requested)

A: I think my response was again I can't fix that date at the time that I first knew it but we're believing it to be 1968 and then my next thought is what research, is it an obscure and questionable piece of research with someone with no credentials or substantial research we should have been aware of.

Q: First of all, could you answer my question?

MR. PECK: Objection. I think he has.

MR. ROEDER: I'll move to strike it.

MR. PECK: You can move to strike it if you consider it nonresponsive but I think the witness has answered your question.

MR. ROEDER: I don't think so. The record will show what the record will show and I'll make the motion.

MR. PECK: If you want to ask it again.

MR. ROEDER: Can you read the question back, Miss Court Reporter?

(The reporter read the record as requested)

MR. ROEDER: Can you answer my question?

MR. PECK: I'll object again. The question has been asked and answered.

Q: It's a simple question. Can you answer?

A: I got to answer the same way. I don't know exactly the date that I first learned of the ecological issue. We're believing it to be 1968 but I'm not positive of that.

Q: I want to show you this document which is Plaintiff's 75. It is a memorandum to G. R. Buchanan, is that your boss?

A: In 1967? Maybe.

Q: Take a moment to review that document, sir.

MR. PECK: Just for the record I object. This isn't a document to be used for this witness but that's just a technical objection between the attorneys.

A: So far what I've seen is insecticide use but

I'll read on. Okay.

Q: Sir, Exhibit 75 is a document to Mr. G. R. Buchanan in St. Louis signed by David Wood dated the 26th of January, 1967. In reviewing that document does it refresh your recollection that the identification and nature with respect to polychlorinated biphenyls that would persist was made as early as 1967?

A: I have not seen this document before, doesn't refer to anything, any products that I was working on directly. I was not aware of this.

Q: Okay. Mr. Buchanan never discussed it with you?

A: To my memory, no.

Q: As of the 26th of January 1967 Mr. Buchanan was your superior?

A: As I remember that date he was.

Q: Did you ever discuss with Mr. Buchanan issues related to the PCB environmental problems?

A: I don't remember such conversations. Doesn't mean I did or didn't. I just don't recall discussing it. I remember discussing it with Bill Richard.

Q: Let me show you what's been marked as Plaintiff's Exhibit 282.

MR. PECK: This wasn't designated.

MR. ROEDER: I did not designate these. If you want to make your objection I'll tell you why. I indicated in my letter I may use documents that were previously marked and I tried to as best I could draw your attention to the documents I expected to use but I was surprised by the witness' testimony and I want to see if this refreshes his recollection as to certain matters.

MR. PECK: I'll allow you a couple of these but I know this has been a continuing problem with respect to the depositions of Monsanto witnesses being surprised by the presentation of documents which could have been designated ahead of time but had not been and it's a problem to my understanding that's not occurring in the deposition of Tennessee Gas witnesses and I'll allow you to do it with a couple of documents but beyond that we'll just have to see.

MR. ROEDER: I disagree with the characterization. As I understand it Monsanto's designations of Tennessee Gas witnesses have amounted to hundreds and hundreds of documents. The specific designations for this witness are minor but I also reserve the right to use additionally marked

exhibits. I went to the extent last time I was here in St. Louis of producing yet another full set of our exhibits for the Husch and Eppenberger firm because they indicated they didn't have copies because your firm took them back to North Carolina. So those binders you see on the table are additional copies of all the exhibits I had marked and Mr. Duff had marked that we produced for Monsanto's convenience. In any event, I'm surprised by the witness' testimony.

MR. PECK: I'm stating my objection pursuant to the case management and just asking that those procedures be followed with respect to the deposition of this witness and other Monsanto witnesses and I understand your point and I'll allow you some leeway with some documents. If it goes beyond that I'll have to object.

MR. ROEDER: We'll take it a step at a time.

MR. PECK: I don't consider your position to allow you to have leeway to use all, were into 300 some exhibits with this witness without going back and allowing him to review.

MR. ROEDER: Oh, sure.

MR. PECK: I'm not talking about reviewing them as you set them in front of him but I don't

think it's fair to say and I reserve the right to use all other exhibits designated and expect a witness who has a very limited involvement to have to review 300 some exhibits in preparation for his testimony. That's my point.

MR. ROEDER: I understand it and I have attempted to identify those documents.

MR. PECK: I agree this is only the second one.

MR. ROEDER: Right.

Q: Exhibit 282, sir, is a memorandum to Mr. David Wood from R. Emmet Kelly, M.D. who is in charge of the medical department, correct?

A: Correct.

Q: Dated February 10, 1967 and Mr. Buchanan received a copy of this memorandum as well, correct?

A: Correct.

Q: In this document Dr. Kelly writes "We are very worried about what is liable to happen in the states when the various technical and lay news media pick up the subject. This is especially critical at this time because air pollution is getting a tremendous amount of publicity in the United States." I read that correctly, right?

A: Yes.

Q: Is that consistent with your recollection as to Monsanto's own view as to pollution and what might happen if indications of environmental pollution were discussed concerning its own products?

A: With my background at Monsanto I don't interpret that the same way you did, particularly as I read the rest of the document. The medical director is saying he wants to get more information who did this work, do we have the entire report, et cetera, et cetera. So what I see is a very logical, responsible and technical response. Let's get the facts and analyze them and until that time let's not let a press motivated by other purposes run amuck with this. Let's get the facts. I don't see this covering up anything which is what I see as your inference. I see this as a very logical approach.

Q: My question is my question, sir.

Dr. Kelly indicates "The consensus in St. Louis is that while Monsanto would like to keep in the background on this problem we don't see how we'll be able to in the United States." Do you see that?

MR. PECK: Object to the form of the question as to what Dr. Kelly indicates as to whether the

document states this. That is the nature of my objection but go ahead.

Q: That's what Dr. Kelly wrote in the memorandum, correct?

A: Let me read it. That's what it says.

Q: Okay. Were you part of that consensus?

A: You're asking me what my feeling would have been 20 years ago.

Q: No, I'm showing you this document and seeing if it refreshes your recollection whether or not you were consulted?

A: No, I was not consulted.

Q: So Mr. Buchanan who is your superior didn't ask for your opinions with respect to this issue?

A: As best I can recall he did not.

Q: Now, continuing in this exhibit "We feel that our customers, especially NCR, may ask us for some sort of data concerning the safety of these residues in humans." That's what it says, correct, sir?

A: Yes.

Q: "This obviously might be opening the door to an extensive and quite expensive toxicological/pharmacological investigation." That's what it says, as well?

A: It says that.

Q: Did you have any discussions with Dr. Kelly or anyone else at Monsanto as to what the PCB environmental pollution problem or knowledge of it would lead to?

A: First of all, the NCR application was not an fluid application so I had nothing to do with that. And your question again was?

MR. ROEDER: Can you read it back, Miss Court Reporter?

(The reporter read the record as requested)

Q: Let me rephrase the question.

A: I'm having trouble.

Q: We had discussed earlier in your testimony, sir, whether Monsanto could have done different tests, for example, with respect to fish, do you recall that?

A: Yes.

Q: And with respect to other potential uses, for example, on compressors in the Queeny Plant and things of that nature, do you recall that testimony?

A: Yes.

Q: Were you concerned yourself once you first learned of the PCB environmental problem that the cost would be expensive in analyzing this issue?

A: No.

Q: That was not an issue you were involved yourself in?

A: The cost -- yeah, that's correct.

Q: The last document I expect to show you not previously designated is Exhibit 200. It is a letter from Rising and Strand to David Wood dated November 28, 1966 and I will represent to you that Mr. Mason has testified Rising and Strand was the agent for Monsanto in Sweden. Are you familiar with them?

A: The name is familiar.

Q: As you look at it it refreshes your recollection as to who they were?

A: Yes.

Q: Just examine that document, sir, and see if that refreshes your recollection anyone ever told you Monsanto was aware of this PCB environmental problem as early as 1966?

MR. PECK: For the same reason as specifically stated I make my objection to the case management use of undesignated documents but we'll permit it for the use of refreshing his recollection on this isolated point.

A: Okay.

Q: Does that refresh your recollection, sir?

A: Of what?

MR. ROEDER: Could you read back the question?

(The reporter read the record as requested)

A: Same kind of answer. First I was aware of the ecological issue was in a meeting Bill Richard presented it, that date is still fuzzy. We're thinking it was 1968 but I can't swear to it.

Q: When Mr. Richard presented that issue did he distribute any handouts?

A: No, he got up and said I got something to say.

Q: How was it presented as best you can recall?

A: Each person participating in the staff meeting had an opportunity to talk about their area and when Dr. Richard had his turn to speak about the research area he informed the business group managers that there was an issue arising that we needed to look at and it was the thinning of peregrine falcon shells. Somewhere down the line I have heard of things that sound familiar in that Sweden report about fish and so forth. Again dates are fuzzy when I heard it.

Q: Just referring back to Exhibit 396 the

Aroclor delayed orders allocation from Mr. Bergen to Dr. Anagnostopoulos?

A: Yes.

Q: Turn to the last page of the document. Mr. Bergen signs it and Mr. Waychoff signs it, as well, correct?

A: Yes.

Q: Who was Mr. Waychoff at that time?

A: Walt Waychoff. I want to say he was development director but I don't remember. I'm not sure.

Q: Let's go to the document. Mr. Bergen writes "There is no need to point out the urgency of the situation because it is most urgent. We are already delaying some customers and causing them to shut down their production. Our salesmen are spending a lot of time placating customers when they could be out doing more productive selling." Do you see that?

A: Yes.

Q: "It is arousing the customer's wrath and there is nothing we need more than for them to get irritated at us and put a second source in this business." Did I read that correctly?

A: Yes.

Q: That refers to the fact that Monsanto was

the only PCB source in the United States?

A: The only PCB producer in the United States.

Q: So at the time that you're learning of the environmental pollution problem Monsanto is running flat out and producing the PCB's to fill existing orders, correct?

A: That appears to be right.

(Plaintiff's Deposition Exhibit Number 398 was marked for identification).

Q: Exhibit 398, sir, is a memorandum from you to Dr. Richard dated May 23rd, 1968?

A: Yes.

Q: Three days after Dr. Richard wrote you the exhibit, the memorandum which is Exhibit 397, correct?

A: Correct.

Q: Your exhibit, your memorandum of May 23rd, '68 is in response to Dr. Richard's memo to you, isn't it?

A: It appears to be.

Q: You write "The major entry of Aroclor in the sewers and streams from industrial fluids applications is in industrial hydraulics." Was that true when you wrote it?

A: Yes.

Q "We are, you underlined are, prepared to design, install and start up effective fluid recovery systems which remove Pydraul from plant effluent." Was that true when you wrote it?

MR. PECK: Object to the form of the question with respect to the question who wrote it, who underlined the word are. I think the document, the document on its face is vague whether or not that is handwritten underlining, typed underlying, whether it was underlined by the person who received this copy. There could be any number of explanations how that came to be underlined. It assumes facts not in evidence.

Q: Do you know if you underlined it, sir?

A: I have no recollection.

Q: Let me show you a different version of that same document and maybe we'll just mark this as 398-A.

(Plaintiff's Deposition Exhibit Number 398-A was marked for identification)

Q: The objection raised by your attorney is that he doesn't know if you did the underlining and you don't know if you did the underlining?

A: I have no remembrance.

MR. PECK: My objection was to the form of

the question assuming he underlined it.

Q: Do you have any reason to dispute the fact that you underlined the word are?

MR. PECK: Objection to the form of the question in light of his testimony. He just said he doesn't know whether he underlined it or not.

MR. ROEDER: You can answer the question.

Q: Dr. Richard's question was are we preparing ourselves and my answer is we are prepared and I don't myself see a reason to underline the word or not underline the word. It's got the same meaning. Are we preparing, the answer we are prepared to design and install the systems. So I don't know whether I underlined it or not but I can't see a great significance.

Q: All right. Plaintiff's Exhibit 398-A bears production number TNGS 11853 and the word "are" is underlined in that copy of the document as well, is that not correct, sir?

A: Yes.

MR. PECK: For the record it bear other handwritten notes as Exhibit 398.

MR. ROEDER: I'll concede that. It's two copies of a document that were produced to us by Monsanto of the same memo.

Q: Was that statement true when you wrote it?

A: Yes, it was.

Q: You write "We have demonstrated this capability thru Findett." Who are they?

A: Findett is a small company which did some Pydraul reclamation for customers and later some reclamation of other Monsanto fluids.

Q: Was this statement true when you wrote it?

A: We are prepared to design and install?

Q: No, we have demonstrated this capability thru Findett?

A: It's my recollection that Findett was reclaiming Pydraul fluids for some customers who then asked them to design a system to help catch it in the plant and reclaim it.

Q: So the answer is the statement was true?

A: The statement is true.

Q "A few customers use the system as an economic measure." These are Pydraul customers?

A: Yes.

Q: You continue to write "If and when more customers are pressed to keep Pydraul out of the streams due to government legislation we are prepared to act by referring them to Findett or serving as prime contractor, subcontracting to

Findett." That's what you wrote?

A: That's what I wrote.

Q: Is that the extent of the preparations that Monsanto had done to miminize customers -- strike that.

Is that the extent that Monsanto had done as of this date, sir, to prepare itself and its customers to minimize or prevent process stream and air pollution with respect to PCB's?

A: That's a broad question. I have to answer, no, we saw it in the hydraulic systems. The customers had proper seals so their equipment didn't leak that much. We did things to minimize losses of fluids really for economic purposes at the time because the ecological issue had not come to my attention. This particular thing had to do with economics and it had to do with Findett and our mutual customer, it didn't come from Monsanto so your question is hard to answer, is this all we did to prevent losses of fluids for ecological issues. No, it's part of what we did to prevent fluid losses and it was presented as an economic rather than ecological issue.

Q: Why wait until the time when customers were pressured to keep Pydraul out of the streams due to

governmental legislation?

MR. PECK: Objection to the form of the question.

MR. ROEDER: In light of the objection I'll rephrase the question.

Q: Your memorandum says if and when more customers are pressed to keep Pydraul out of the streams due to government legislation you're prepared to act by referring them to Findett or serving as prime contractor, subcontracting to Findett. My question is, in light of your testimony why wait until customers are pressed to keep Pydraul out of streams due to government legislation?

A: It's a matter of filling a need. The customer sees no need, has no need, we're not going to press things on that they don't want. The economic loss is their loss and they balance the recovery costs against the replacement fluid loss. As far as the ecological issue I state again it was just surfacing as far as I know at this time.

Q: Monsanto could have quickly referred the customers to Findett or otherwise made the customers aware of the ecological issue at this time?

A: This is referring to an economic issue up to the date of this memo.

Q: The ecological issue is referenced and introduced to you directly in the May 20th, 1968 memorandum, right?

MR. PECK: Objection. That mischaracterizes the previous testimony.

MR. ROEDER: Let me rephrase in light of the objection.

Q: Dr. Richard's memorandum to you addresses itself to the ecological issues, does it not?

A: Yes, it does.

Q: Okay. And you told Dr. Richard you were prepared to design, install and start effective fluid recovery systems that would remove Pydraul from plant effluent three days later, right?

A: Yes.

Q: Why not let the customers know then?

MR. PECK: Objection. It mischaracterizes his testimony.

Q: I mean for ecological reasons, why not tell the customers then?

A: I guess we weren't assured yet there was an ecological issue. I was not -- the memo says that the FDA wants to look for Aroclor in wildlife. That to me is not an indication that one should all of a sudden tell customers something they need to do.

The FDA requested a sample, they didn't say, hey, this is an ecological issue here.

Q: Well, at the point when Monsanto's plants are running flat out, you're selling a product which is profitable, you would agree with me at this point, right, as of 1968 your plant is running full out?

A: Yes.

Q: April of '68?

A: Yes.

Q: You're producing a product greater than 40 percent gross profit margin, correct?

A: That's correct.

Q: And you're now aware of an environmental pollution problem?

A: I don't agree with that. I'm aware of a potential problem that's being investigated.

Q: If Monsanto had accepted the research of the Jensen and Widmark as early as the middle of 1967 there would be no reason to wait to let them know this issue, would there, sir?

MR. PECK: Objection to the form of the question. It's hypothetical. Let's leave it at that.

A: From the documents you just showed me there

was a piece of research work done which needed to be investigated, duplicated, needed to be understood for, before a lot of, involvement of a lot of customers, until -- somebody did a piece of research work, that's not the end of it. You've got to investigate the research work, duplicate it before it's accepted. That's standard scientific procedure. You've got to understand, is it PCB, where is it coming from, what should we do about it. Then you act in a responsible way. This is way too early from my understanding.

Q: You had always determined or relied, sir, did you not, on the opinions of the medical department as they related to PCB's and its toxicity up until this point?

A: Yes.

Q: Would there be any reason why you would not reply upon Dr. Kelly's own opinion with respect to PCB's at this point?

MR. PECK: Objection to the form the question. It infers evidence that's not part of his reference. He's given no indication he did not rely upon or disagree with Dr. Kelly.

MR. ROEDER: I'll find a document. Let me take a few minutes break.

(Short Recess)

Q: During the break, sir, we got a copy of the testimony Dr. Kelly gave in the Trans-Western case.

A: What is the Trans-Western case?

Q: That's another lawsuit against Monsanto Company.

A: Oh.

Q: And in this testimony, in light of the objection that Mr. Peck raised, Dr. Kelly was asked these questions and maybe I can show this to the witness or I can read it into the record but since it's not part of this record, Dr. Kelly's testimony, and Dr. Kelly has passed on, correct?

A: I don't know.

Q: All we got is what he said about this earlier. He was asked the question,

Q. Did there come a time when you personally accepted as accurate or valid the work done by Jensen?

A. Yes.

Q. And when did you so accept it?

A. I think the middle of 1967.

Let me show that to you.

MR. PECK: That's okay. I've seen it before.

Q: In light of that would there be any reason not to accept Dr. Kelly's own opinion you had at Monsanto when you were working there in 1968 on this issue?

MR. PECK: I object to the question on the grounds I think it's inappropriate as phrased to ask a witness to either agree or disagree with an isolated statement taken from a multi day deposition of a witness in their 80's which, when there's other statements of Dr. Kelly on the same issue both in documents from the time period involved and also from other sworn testimony. I'm just objecting to the form that it's inappropriate. I think you can ask him and show him the document and say does this transcript say that and he can say yes or no but I think the question as phrased is inappropriate.

MR. ROEDER: I'll show the witness the document.

Q: In light of Mr. Peck's objection I'll show you Plaintiff's Exhibit 340 which is a selection from the deposition of R. Emmet Kelly, May 1, 1992. And the lines I was referring to, sir, start on page 243, line 22 and go to the carry-over page. Take a moment to review that and see whether or not it was properly described?

MR. PECK: And you're going to ask him whether the transcript says what it says?

MR. ROEDER: The transcript says what it says and he can confirm that.

MR. PECK: This is an exhibit in Tennessee Gas?

MR. ROEDER: It is.

A: To me the dates are still kind of fuzzy. Oh, I see the end of '66 or '67.

MR. PECK: Is there a question pending?

MR. ROEDER: First of all, he's going to determine if I read it correctly, the lines I pointed the witness to.

A: Okay. I have taken a look at it.

Q: First of all, I accurately read what Dr. Kelly as transcribed testified to in that deposition, is that correct?

A: The part you read you read correctly.

Q: Now, before we took the break I wanted to be clear, I'm not sure we got this in the record, you had previously always accepted as true the medical department's determination on issues relating to PCB's?

A: Correct.

Q: Would there be any reason that you know of

as of 1968 when you learned about the PCB environmental issue not to accept Dr. Kelly's own personal view?

MR. PECK: Objection to the form of that question because it I think might be vague to the witness to imply that it was the view of Dr. Kelly in 1968 when, in fact, the question that's being asked is actually as to a statement of Dr. Kelly in 1992. Just so there's no misunderstanding there.

Q: So the reference is clear, sir, you testified that you thought that it was premature, needed more testing done, couldn't talk to the customers about this, so the question is, if your own medical director had accepted these findings as true why wouldn't you let your customers know?

MR. PECK: I'll object again because the question implies Monsanto's medical director had accepted these facts as true in 1968 when, in fact, the only statement we have in this record through Exhibit 340 is the recollection of Dr. Kelly in 1992.

MR. ROEDER: So the record is clear we have the admission of Dr. Kelly that he accepted it in 1967.

MR. PECK: As recalled in 1992.

A: Throughout Dr. Kelly's statement here the dates keep kind of jumping around. I'm trying to remember the specific question. Did I accept the medical department's recommendations on Aroclor? Yes, I did.

Q: And if the medical department had accepted the analysis of the PCB environmental pollution problem as early as the middle of 1967 before you recall being made aware of it would there be any reason to not let your customers know?

MR. PECK: I object again as implying evidence that's not in this record, that the medical department had accepted in 1967 this issue. That is not in the evidence of record of this case. What we have through Exhibit 340 is Dr. Kelly's recollection as to when he accepted it. I think it's an important issue.

Q: In light of the objection I'll amend the question to say if your medical director had accepted it and you always relied upon Dr. Kelly's judgment, correct?

MR. PECK: I'll object again for the same reason, that implication is the medical director accepted it in 1968 when that fact isn't in evidence or '67 or any time in that time period rather than

1992, the recollection of a gentleman in his early 80's.

MR. ROEDER: I admire your persistence in attempting to coach the witness.

MR. PECK: I'm not trying to coach him.

MR. ROEDER: You've only made three objections, maybe more, but under the Kentucky rules you can simply state the basis for the objection once and no more. You're gone well beyond that. I will object to that.

Q: Can you answer my question, sir?

A: I've got to say not really. I recall a major effort at the time it was accepted that there was an ecological problem. There was a major effort to inform customers of various fluid products containing chlorinated biphenyls, there was an issue, and we would help them resolve that issue. That occurred after I left the Pydraul and, in fact, Therminol fluid part of the program where, for example, David Wood was in charge of the heat transfer fluid chlorinated biphenyl system conversion. So our customers were informed, action was taken at a time that I was already out of the fluids program, per se, and was working on acquisition studies and other things. So you seem

to be inferring that there was information that I didn't act on and I don't think that's accurate.

Q: I'm not suggesting that. What I'm saying is that if Dr. Kelly who is the medical director accepted the research relating to the environmental pollution problem by Jensen as true almost a year before you learned about it and you learned about it, your best recollection is about May of 1968, what reason would there be not to at least alert your customers of the potential problem?

MR. PECK: I object again on the same basis just so the record will be consistent that there's implication of evidence not in the record here that Dr. Kelly or the medical director or Monsanto had accepted this issue in 1967.

Q: Can you answer the question?

A: I got to agree, the dates are very fuzzy. I do remember Monsanto being applauded for taking a very responsible position when an ecological problem was confirmed and that occurred after I left the fluid program. Exactly when Dr. Kelly accepted some Swedish preliminary work that had not yet been confirmed, I can't attest to that date. I know it was going on here, there was some recovery work done for economic not ecological reasons because

ecological reasons were not known to be an issue as far as I can see in May of 1968. So I've got to say I don't know that Dr. Kelly knew that there was a problem in mid 1967. I have no way of knowing that.

MR. ROEDER: Can you just read back my question, Miss Court Reporter.

(The reporter read the record as requested).

MR. ROEDER: I move to strike your previous answer. It contained volunteered information. Can you respond to my question?

MR. PECK: Objection. He has answered the question several times.

MR. ROEDER: Not yet.

A: The question makes suppositions and says answer that and I can't answer on suppositions. I'm saying as soon as -- I was out of the Pydraul program at the time the action was taken. I was out of the Pydraul program at the time. I am aware there was a confirmed issue to alert customers to. Now we're, we're discussing if this happened and if that happened would there be a reason not to, not to take action. And I guess that's almost unanswerable. I don't think the dates are correct.

Q: You don't dispute what Dr. Kelly said there,

do you?

A: Of course I do. He's fuzzy about the dates. There was research done in 1966, which after other work was done and confirmed he accepted. And he thinks some 20 some odd years later that might have been the middle of 1967. I have no way of knowing. I'm not Dr. Kelly.

Q: How about did Dr. Richard ever tell you that Dr. Kelly expected that Monsanto would "lose slowly"?

A: No.

Q: Did Dr. Richard ever tell you as of May 15th, 1968 that "Dr. Kelly seems correct, we're hoping to lose slowly and any info we get which is detrimental must be repeated so why pay for it?"

A: Would you repeat the question?

Q: Sure.

MR. PECK: Object to the form the question including reading from the document.

Q: Did Dr. Richard ever tell you that, that Dr. Kelly said or that Dr. Kelly was correct, we're hoping to lose slowly, any info we get which is detrimental must be repeated so why pay for it, did you ever tell you that?

MR. PECK: Objection to the form.

A: I don't recall hearing that nor do I understand it.

Q: Dr. Richard was the person that was giving you the information originally with respect to the problem, right?

A: Yes.

Q: Did Dr. Richard ever tell you that, that any results which are detrimental would have to be repeated so why pay for it, why pay for that additional usage?

MR. PECK: Same objection to the form.

A: If the question was do I recall Dr. Richard telling me, I do not recall Dr. Richard telling me that.

(Plaintiff's Deposition Exhibit Numbers 399 thru 399-A marked for identification)

Q: Showing you two exhibits, 399 and 399-A, sir, Exhibit 399 is a memorandum from Dr. Richard to Lou Stark dated August 2nd, 1968 and you're shown as a carbon copy recipient, correct?

A: Correct.

Q: This particular document, TNGS 18243, was sent to Jack Garrett, right?

A: Yes.

Q: Exhibit 399-A is an additional copy of that

same document, production number TNGS 11860, and it has handwriting in Dr. Richard's hand, correct?

A: Right.

Q: It states, does it not, Lou, Carl G did some crude experiments saying less than 5 parts per million was soluble in water. Possibly we could use some more precise measurements. Could you read the next part I recognize --

A: It looks like I relayed.

Q: I relayed the less than 5 parts per million to Dale Smith, 8/1/68, WRR.

MR. PECK: Just for the record I object to everyone's interpretation of the handwriting. The document speaks for itself since it is unclear.

Q: And you're familiar with Dr. Richard's handwriting, are you not?

A: I received a lot of handwritten things by Dr. Richard. They were usually more clear than this.

Q: In any event this is a memorandum regarding Pydraul solubility in water and stream pollution, correct?

A: Correct.

Q: And why would you get a copy of this document? Would you still be dealing with Pydrauls

in a product capacity?

A: Probably so. This is right about that transition period we discussed about. Looking at the recipients of copies I would think so.

Q: Okay. And for the record Dr. Richard asks Lou Stark "Do we have solubility of Pydraul 312 in water at say 15 to 30 degrees Celsius? We should have this figure to help our medical department answer questions on stream pollution and recovery of Pydraul. We should also relay numbers on solubility of Aroclor in water", do you see that?

A: Yes.

Q: Did Monsanto have this information at this time to the best of your recollection and knowledge?

A: I don't know. I'd see our research director and ask one of his people that question, do we have solubility and so I don't know. I would surmise we didn't.

Q: That's all I have for that right now. This has previously been marked as an exhibit and I don't have the number in front of me and I'll mark it again.

(Plaintiff's Deposition Exhibit Number 400 was marked for identification)

Q: This is Exhibit 170. That's previously been

marked as Exhibit 170.

MR. PECK: Again for the record I object under the case management this being a document not designated to be used in this deposition.

MR. ROEDER: Actually it has been but it was previously marked, as well. I would rather use the previous number.

MR. PECK: That's fine.

Q: And it's, I've given it to you in the form it was produced to us but it is a December 30, 1968 memorandum from Dr. Richard to W. A. Kuhn and you're listed as a carbon copy recipient, right?

A: Yes.

Q: At this time were you still involved with Pydrauls?

A: From the distribution list it looks like I may not have been directly involved. I may have been manager of commercial development and, therefore, interested in the management role or I may have been the supervisor of Pydraul salesmen or a direct role. I can't say. This is right at that transition point when I left the Pydraul.

Q: Dr. Richard writes in the second page of the memorandum "I believe we should help our customers dispose of off-grade or non-reworkable Aroclor,

either by incinerating or toxic dump." Do you see that?

A: Let me just make sure. Okay.

Q: Did you share that belief?

A: I would say that I didn't have the background or technology to state. I would have no reason to dispute Dr. Richard's opinion. Lacking any independent data of my own I would go along with him.

Q: Dr. Richard concludes this memorandum which is intended to give Mr. Kuhn, make him more familiar with the legal and political problems facing Aroclor by saying "We probably have six months to one year while they fight out the DDT case. I want to use this time to miminize our exposure. We will need your help in setting TSD targets." Do you see that?

MR. PECK: I'll object to your use of the intent of the document.

Q: The first paragraph of the document reads, does it not, "Bill, you wanted to become more familiar with the legal and political problems facing Aroclor with regard to pollution and the accusations in the literature that chlorinated biphenyls are poisoning and killing wildlife." That's what he writes?

A: Yes.

Q: He continues, These wildlife people have to be taken seriously. They have taken the DDT industry to court in Wisconsin to prevent the use and sale of DDT in Wisconsin and if they win in that state DDT will be banned in many others." He wrote that, as well, right, sir?

A: I see that.

Q: He continues "Our our problem is that Aroclor has been "identified" along with DDT residues and hence we are almost certain of being drawn into the court records and may also be one of the scapegoats of the DDT defense. The wildlife people have accused Aroclor of doing all the bad things of DDT." He writes that well as?

A: Yes.

Q: Dr. Richard concludes "We probably have six months to one year while they fight out the DDT case."

A: May I interject? I having trouble jumping from the beginning the end.

Q: Sure. Read the whole document. Take as much time as you would like.

A: Okay. Thank you.

Q: All right. Dr. Richard after he lays out

his potential steps in this memorandum says "We probably have six months to one year while they fight out the DDT case. I want to use this time to minimize our exposure. We will need your help in setting TSD targets", do you see that?

A: Yes.

Q: Did you agree with Dr. Richard?

A: About what?

Q: They had six months to year to fight out the DDT case?

MR. PECK: I object to the form of the question but go ahead.

A: I have no way of assessing the time but I accept that he's estimating correctly. I have no independent information.

Q: Basically that you had a year before people, the wildlife people as he suggests return and address themselves to Aroclor?

A: A year to develop the facts before there was focus on PCB's, per se.

Q: Is that because the environmental people were now concentrating on DDT and PCB is the next issue on the horizon?

A: That's what he seems to be inferring in this memo.

Q: It says we will need your help in setting TSD targets, what is he referring to?

A: TSD, technical service department, related to the -- I don't know, I'm speculating now, but it had to do with the manufacturing plant that made PCB's and the work he recites earlier in the memo that needs to be done.

Q: This is to minimize the pollution in the air and streams relating to Anniston and also Krummrich?

A: Yes.

Q: And so the record is clear he writes "I believe we should make our plants have minimum air or stream pollution. I believe that Anniston is vulnerable and that off-gas HCl and Aroclor should be 100 percent controlled. Krummrich may also need help." So what he wanted to do is set emission standards, is that correct, and meet them?

MR. PECK: Objection to the form of the question.

Q: For those plants, is that what your understanding of this memorandum?

A: I understand him to say we should make efforts to control effluent as much as possible.

Q: Do you know how much effluent was being emitted from the Krummrich Plant?

A: No, I don't.

Q: In excess of 5 pounds a day, 10 pounds a day?

A: I don't know.

Q: This is previously marked. I'll give it to the witness. I'll find the number. This has already been Marked as Exhibit 84. It is the May 13, 1969 memorandum from Dr. Richard regarding Aroclor analysis in pesticide residues.

Sir, is this a document you looked at in preparation for your testimony today?

A: Yes, it is.

Q: You received a copy of it?

MR. PECK: As to when? Yesterday or --

Q: No, you would have received a copy of this in your ordinary course, you're listed as a carbon copy recipient?

A: Yes.

Q: Now, this memorandum reflects Dr. Richard's meeting with Professor G. Widmark at the University of Stockholm in May of 1969, correct?

A: Yes.

MR. PECK: Objection to the form. It speaks for itself.

Q: Did you discuss this memorandum with Dr.

Richard?

A: I don't remember discussing it with him, no.

Q: Okay. Other than looking at this document do you, do you have any recollection of this document other than what appears to its face?

A: No.

Q: All right. That's all I've got for that.

(Plaintiff's Deposition Exhibit Number 400 was marked for identification)

Q: Sir, Exhibit 400 is a memorandum you wrote to Mr. Papageorge dated January 23, 1970, correct?

A: Correct.

Q: Production number TNGS 11899 and in this memorandum you're advising Mr. Papageorge of a potential practical, low cost method for reducing Aroclor content of plant effluent streams, correct?

MR. PECK: Object to the form. The document will speak for itself.

Q: Aren't you?

A: Yes.

Q: Were you out of Pydrauls at this point?

A: Yes, I was.

Q: What was your purpose in sending this memorandum to Mr. Papageorge?

A: Clint Kemp was I believe my boss at the time in commercial development and the technology mentioned in memo was something he was quite eager to evaluate for commercialization. One possible use of it could be the removal of various things from waste streams including the Pydrauls and so I informed Mr. Papageorge who was involved with the ecological issues and hygiene that this existed and that he might want to look into it because of his work on the ecological issue.

Q: How long were you developing the marketing for Therminol before you went into the management issue of developing new technology and buying, acquiring?

A: Boy. The best I remember it was three or four years before I left the fluids part of the business, the sales part of the business. At maximum, five years.

Q: Did you ever report to Mr. Paton?

A: I think for a brief period I did.

Q: And that's when he came back into the --

A: I inferred earlier I had communication with him when we had parallel jobs or reported to him for a brief period.

Q: So Mr. Kemp was, was not Mr. Paton's

predecessor in that job, was he?

A: I don't believe so.

Q: And Mr. Paton was marketing manager for Therminols, was he not?

A: I don't remember that he ever was that.

Q: Did you ever have any discussions yourself personally with anyone at Tennessee Gas relating to PCB products?

A: I don't remember such conversations.

Q: Do you have anything that would refresh your recollection?

A: Copies of documents if they exist.

Q: I haven't seen any and your counsel hasn't shown you any, has he?

A: No.

Q: Did you ever have any discussions with anyone at Tenneco regarding Therimols that contain PCB's?

A: Again not that I recall.

Q: And you don't know what would refresh your recollection?

A: Same sort of thing.

Q: How about Tenneco Chemical?

A: Again, I don't remember any such communication.

Q: When you were involved in the marketing of the Therminols were you concerned with insuring that Therminol FR that would be used in systems was properly drained and sent back to Sauget for incineration, was that part of your responsibility?

A: That came later. I was involved with the sale, with the marketing of Therminol FR and with the reclamation of spent, partially decomposed Therminol FR was reclaimed through Findett but the incinerator was not an issue at the time I was involved in the marketing.

Q: And the Findett issue, that related to an economic basis and not an environmental basis?

A: Yes.

Q: So there would be fluids that were partially used reclaimed in part and Findett had a service to do that?

A: That's correct.

MR. ROEDER: Let me check my notes. We may be done. I don't have anything further.

MR. PECK: Mr. Davis, you'll have opportunity to review your testimony.

A: Thank you.

MR. PECK: I will take care of the logistics of getting that to you.

COMES NOW THE WITNESS, RICHARD DAVIS, and having read the foregoing transcript of the deposition taken on the 28th day of November, 1995, acknowledges by signature hereto that it is a true and accurate transcript of the testimony given on the date hereinabove mentioned.

RICHARD DAVIS

Subscribed and sworn to me before this

day of , 1996.

My Commission expires:

Notary Public

np

Tennessee Gas vs. Monsanto

ARR

State of Missouri

SS.

County of St. Louis

I, Nancy Prange, a Notary Public in and for the State of Missouri, duly commissioned, qualified and authorized to administer oaths and to certify to depositions, do hereby certify that pursuant to Agreement in the civil cause now pending and undetermined in the Commonwealth of Kentucky, Rowan Circuit Court, Civil Branch, to be used in the trial of said cause in said court, I was attended at the offices of Gore & Perry Reporting Company, 100 North Broadway, in the City of St. Louis, State of Missouri, by the aforesaid witness; and by the aforesaid attorneys; on the 28th day of November, 1995.

The said witness, being of sound mind and being by me first carefully examined and duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth in the case aforesaid, thereupon testified as is shown in the foregoing transcript, said testimony being by me reported in shorthand and caused to be transcribed into typewriting, and that the foregoing pages

correctly set forth the testimony of the aforementioned witness, together with the questions propounded by counsel and remarks and objections of counsel thereto, and is in all respects a full, true, correct and complete transcript of the questions propounded to and the answers given by said witness; that signature of the deponent was not waived by agreement of counsel.

I further certify that I am not of counsel or attorney for either of the parties to said suit, not related to nor interested in any of the parties or their attorneys.

Witness my hand and notarial seal at St. Louis, Missouri, this 21st day of December, 1995.

My Commission expires August 8, 1998.

Nancy Prange

Notary Public in and for the
State of Missouri

St. Louis, Missouri

August 21, 1956

Mr. G. R. Sido

Washington, D. C.

Memo - GRS to EPW 8/13/56

PYDRAUL 150

Messrs.:
Jim Davis - Rcbts Bldg
R. Davis - Rcbts Bldg.
J. L. Hammer-Rcbts Bldg.
F. H. Langenfeld-RcbtsBld
H. S. Litzsinger-RcbtsBld
J. H. Lum - W.C.
J. W. Newcombe - RcbtsBld
M. C. Plummer - RcbtsBld
M. C. Throdahl - RcbtsBld
F. S. Ianty - W.C.
. P. Wheeler - W.C.

I talked to Dr. Treon at the Kettering Laboratory by phone today, and he gave me the following information.

They find 2 to 3.5 micrograms of Aroclor per liter after bubbling Pydraul 150 through bubblers at 72° and 80° F. This amount increases to 0.2 and 0.3 parts per million of Aroclor. This would give a figure for Pydraul of .8 to 1.3 parts per million or roughly, 5 to 10 times higher than the Navy found.

Kettering ran this pretty carefully, taking 48 samples and using two analyses on each sample. Their method could not differentiate any difference between the results at 72° or at 80° F. They were pretty sure the air was saturated because they ran the material through two bubblers, and the figures using two bubblers gave the same as when only using one. They burned the final product and found chlorides so they are pretty sure they are dealing just with Aroclor.

They still have to do the minimum odor figure and passing the air through a scrubber.

I will leave it to your own judgment how much of this you want to tell the Navy, but even using 1 part per million of Pydraul 150 in the air we certainly don't have very much contamination.

R. Emmet Kelly, M.D.

[illegible]

2 micrograms/liter (or 2 mg/cu meter) is Treon's recommended hygienic threshold guide for Aroclor 1242 for 8 hr daily exposures - in other words this is above the Government Ind. Hyg. MAC of 1 mg/cu meter - and submarines would be exposed 24 hrs daily or 8 hr MAC - if the air in the sub were saturated with Pydraul 150, however, it is quite unlikely that such saturation would be experienced. C.W.

TNGS 017878

Pltf's EXHIBIT NO. 375 NP 11-28-95

F. M. Luckett - Chicago
Elmer Wheeler - St. Louis

St. Louis - Roberts Building

March 21 1957

Pydraul 150

Jake Arbogast

Chicago

Bucyrus Erie Company
S. Milwaukee, Wisconsin

Jake. here is one I think you will want to follow-up. We received the following wire on March 15.

"USING PYDRAUL 150 IN HYDRAULIC SYSTEM OF FORGING MANIPULATOR MANUFACTURED BY SALEM BROSIUS OF PITTSBURGH. HAVE HAD NUMEROUS HOSE AND PIPING FAILURES WHICH HAVE RESULTED IN PYDRAUL BEING SPRAYED OVER OUR WORKMEN AND IN A NUMBER OF CASES WORKMENS EYES HAVE BEEN SERIOUSLY BURNED. OUR MEDICAL STAFF AT A LOSS AS TO HOW TO PROPERLY TREAT THESE BURNS AS DO NOT KNOW PYDRAUL ANALYSIS. CAN YOU OFFER ANY SUGGESTIONS AS TO HOW TO TREAT.. CAN YOU SEND US AN ANALYSIS OF PYDRAUL.. HAVE BEEN BUYING THE PYDRAUL FROM SOCONY MOBIL IN MILWAUKEE.

J. E. Smart
Purchasing
Bucyrus Erie Company

Frank Langenfeld phoned Elmer Wheeler our Industrial hygienist and inturn had Elmer phone Mr. Smart in S. Milwaukee.

I am sure Elmer conveyed to him the information on page 18 of the Pydraul booklet. pointing out that there is no corneal damage when Pydraul is sprayed into the eyes. There is a burning sensation which can be allevisted by a 1% Pontocaine solution or a Opthalmic Cortisone Acetate solution. I would suspect also that Elmer Wheeler told Mr. Smart that Pydraul is a phosphate ester based formulation and that we are not at liberty to give details of the formula. However, as you already know Jake. Sloan Kettering laboratories have ~~been running~~ extensive tests on Pydraul and have found its level of toxicity to be low, in fact about equivalent to petroleum based hydraulic fluids.

You will probably want to follow-up by stopping in to see Mr. Smart quite soon to further allay his fears.

Best regards.

Richard Davis

RD:sc

TNGS 017938

Plff's
EXHIBIT NO. 376
TP 11-28-95

SL 1010 PST 12/15/58 SE13

RICHARD DAVIS
ST LOUIS

HAVE LETTER FROM CROWN ZELLERBACH LEBANON OREGON DATED DECEMBER 10 WHO ARE USING PYDRAUL AC IN AIR COMPRESSORS WHICH WE QUOTE IN PART QUOTE IT IS REASONABLE TO ASSUME THAT PYDRAUL VAPOR IS PRESENT IN SOME DGREE THROUGHOUT OUR COMPRESSED AIR PIPING SYSTEM PLEASE ADVISE IF THIS VAPOR IS TOXIC OR HARMFUL IN ANY WAY WHEN USED BY PERSONS FOR BREATHING IN AIR LINE TYPE RESPIRATORS UNQUOTE PLEASE LET US HAVE YOUR SUGGESTIONS FOR ANSWERING

A W HEMPELMANN
SEATTLE

TNGS 018515

Reff's
EXHIBIT NO. 377
NP 11-28-95

bc: Harris Wys, Portland
R. Emmet Kelly, M.D., Genl
Richard Davis, Genl.Off.

X

December 19, 1956

Crown Zellerbach Corporation
Lebanon, Oregon

Attention Mr. A. C. Mancini

Dear Mr. Mancini:

Thank you very much for your letter of December 10 about toxicity of Hydraul AC vapors as might occur throughout your compressed air piping system.

Our Medical Department points out there are two facets to this problem. One is the toxicity of Hydraul AC itself and the second is the concentration of Hydraul AC vapors in the compressed air at the time it is delivered to the worker for breathing.

In animal toxicity screening studies with this product, the oral lethal dose in rats is approximately 40 grams per kilogram and in rabbits, 3.5 to 4.5 grams per kilogram. The greater sensitivity to rabbits is typical of this type of fluid but in either case the figures are such that it would be classed as having a low order of toxicity from the standpoint of accidental ingestion of single doses.

We have tested rats for a 6-hour exposure to an atmosphere saturated with vapors of the fluid. There was a slight reddening of the upper respiratory tract and a slight degree of lachrymation. This in itself would constitute a warning should large amounts of the material contaminate the air stream and a mist rather than vapors occur. There were no other effects either systemic or local.

The second factor deals with the actual amount of Hydraul AC vapor that would be present in the air delivered by the compressor. We have not conducted analyses to determine this amount but it is certainly my opinion of our Medical Department that the concentration of vapors would be very minute and should introduce no hazard to workmen breathing the compressed air if it is used for air masks. This is especially true in view of the negative results in our animal vapor exposure.

Normally traps or filters are installed in such lines to take out

TNGS 018516

RLF's
EXHIBIT NO. 378
NP 11-28-95

any odors, vapors, oil droplets or other foreign material. We know this fluid has been used in many installations similar to the one described, and we have no knowledge of any difficulty resulting.

If we can answer any further questions for you, Mr. Monsini, please let us know.

Cordially yours,

A. W. Hempelmann
District Sales Manager

AWH:fs

TNGS 018517

From MONSANTO CHEMICAL COMPANY

CC J. D. Wright, Pittsburgh

At St. Louis - Building B-2-S

Date February 20, 1959

FEB 2 1 RECD

To Dr. R. E. Kelly

Reference

At Building A-2-S

Subject PYDRAUL AC

ALUMINUM COMPANY OF AMERICA

We are trying to sell Pydraul AC to the Aluminum Company of America through the chief lubrication engineer at Alcoa headquarters. This gentleman, John T. Bunting, asked our feelings regarding toxicity if Pydraul AC is used to lubricate an air compressor supplying air to masks (air helmets) worn 8 hours a day, 5 days a week.

May I please have your comments so I can forward them to Alcoa through our Pittsburgh office. If you prefer, you may certainly write directly to Mr. Bunting at the following address:

Mr. John T. Bunting
Aluminum Company of America
Alcoa Building
Pittsburgh, Pennsylvania

Richard Davis

/is

TNGS 018520

IN 10

Riff's
EXHIBIT NO. 379
MP 11-28-95

August 29, 1960

Mr. S. Facini
Engineering Department
Portable Compressor Division
Chicago Pneumatic Tool Company
Manufacturing Division
Franklin, Pennsylvania

Dear Mr. Facini:

Your letter to Mr. James D. Wright of our Company has been forwarded to me for answer. Your questions are difficult to answer in a generalized way.

As you know, the Pydrayl fluids are insoluble in water as well as heavier than water. Unless these materials are strongly emulsified they will sink to the bottom of any receiving stream and as such will not give rise to the typical picture of oil pollution. If the material is discharged in large concentrations it will adversely effect the organisms in the bottom of the receiving stream which will effect the aquatic life in the stream. This effect will probably not be any more serious than the effect of heavier petroleum oils. If large concentrations of these materials are contemplated in your discharge stream they could probably be removed by emulsion breaking and settling. This can be accomplished by gravity separation if the emulsions can be readily broken.

We have had no experience with any regulatory agency concerning the discharge of these materials. I would imagine that these agencies would frown on the discharge of large quantities of any type hydraulic fluid.

Based on the toxicity studies of these fluids with laboratory animals I would not expect them to be very toxic to aquatic life. On the other hand, this is a surmise on my part since we have no tests on aquatic animals.

In summary I would like to say that if small quantities of these materials are accidnetally spilled into a receiving stream there would probably be no harmful effect. If, on the other hand, a great deal of the material was spilled some readily identifiable damage might ensue.

TNGS 007744

Rlaff's
EXHIBIT NO. 380
MP 11-28-95

I realize that this information is somewhat sketchy but as you know the pollutional potential of any individual discharge can only be measured by the factors that influence that particular discharge. These factors would include the amount of fluid discharged, the total dilution water available in the effluent stream, the total volume of water in the receiving stream and the condition of the fluid in the effluent stream - emulsified or not.

We would be glad to discuss any individual occurrences that you might have in mind.

If we can be of any further help, do not hesitate to let us know.

Sincerely,

Jack T. Garrett
Industrial Hygienist
Medical Department

JTG:pjk

CC - Mr. Richard Davis
Mr. Dale F. Smith
Mr. James D. Wright

Enclosure: Original of attachment to file copy sent back to Dale F. Smith, GO.

September 30, 1959

Mr. H. H. Boettcher
Chief Engineer
Air Products, Inc.
Allantown, Pennsylvania

Dear Mr. Boettcher:

Your questions concerning the effect of Pydraul in stream pollution have been referred to me. I must say that the following statements are based on opinion rather than experimental data.

I do not believe that Pydraul would be any more toxic to fish than the usual petroleum based or phosphate based hydraulic fluid. The toxicity of the two are roughly comparable in all the other manners in which we have tested them. One could set up fish tests and if this problem is sufficiently important, we could schedule a series. However, as you know, the toxicity would be proportionate to the concentration in the river. It seems hard to tell what this might be because it would vary from the day-to-day leaks to a sudden loss of the entire fluid. The cost of this fluid would seem to minimize such a loss.

It is my understanding that the state of Pennsylvania has effluent limits rather than river limits for allowable concentrations of waste material. We have never had this problem arise in any of the other states and I have had no correspondence with Pollution Control Boards regarding percentage or concentration of Pydraul AC in solution permitted as effluent into streams. Static tests can be run on fish and if you can supply me the Pennsylvania state requirements, we will see how soon this can be obtained on Pydraul AC. Do you have a realistic effluent concentration on your present hydraulic fluid or cutting oils? Certainly a 1% to 2% level of any organic material, whether it be cutting oil solvent, hydraulic fluid, or detergent, will very probably kill fish.

It is our experience that Hydraul will settle to the bottom when washed into a stream because of its specific gravity. This would appear to furnish added protection from the standpoint of effect on fish but I realize this is impossible of measurement.

I hope you will be able to provide Mr. Davis more detailed information on your problem, with actual amounts of hydraulic fluid lost per day so we can try to set up a realistic static test on fish. As you know, the state agency has the last word on such problems and if they have any procedures for testing of discharged oils and solvents, if you could tell me where I could obtain those, our tests might be more significant.

Very truly yours,

R. Emmet Kelly, M. D.
Medical Director

RKK:ph

MONSANTO CHEMICAL COMPANY

NOV 5 - REC'D

From LOCATION: St. Louis - General Offices

cc:

DATE: November 5, 1959

SUBJECT: AIR PRODUCTS, INC.
Allentown, Pa.

TO: Dr. R. E. Kelly - A-2-S

Air Products, Inc., represents approximately $300,000 to $500,000 per year potential for Pydraul AC. I appreciate your help in answering some of their questions and would like to call upon you once more.

Air Products asked these two questions:

> "What is the biological and botanical effect on fish life and plant life of Pydraul AC in concentrations of 1%-2% in water?
>
> Supply any information from Pollution Control Boards regarding percentage or concerntration in solution permitted as effluent into streams."

Your good letter of September 30 to Air Products, Inc., supplied answers to these questions. However, Air Products now comes back with the following comment:

> "This item (information we sent) did not answer the question regarding botanical effect of Pydraul AC on grass, shrubs, plant life, etc., in concentrations of 1%-2%, Waste water may contain up to 1% Pydraul AC; Cellulube is definitely detrimental to plant life which is an important consideration, particularly in the southwest.
>
> H. H. Boettcher (Air Products) will check with Pollution Boards in the Pittsburgh area to determine their various limitations on all matters pertaining to spent or waste materials. Also evaluate limits for discharge into streams or sewers. This information will be furnished as soon as available."

Dr. Kelly, difficult as their request is, I will appreciate your sending further comments to:

Mr. H. H. Boettcher
Air Products, Inc.
Allentown, Pa.

with a carbon copy to me and to Mr. R. A. Fitch, Gulf Research & Development Company, Marketing Technical Services Division, P. O. Drawer 2038, Pittsburgh 30, Pa. Many thanks.

Richard Davis

IN /pf

WHY FILE THIS

TNGS 008260

EXHIBIT NO. 382
MP 11-28-95

November 16, 1959

Mr. H. H. Boettcher
Chief Engineer
Air Products, Inc.
Allentown, Pennsylvania

Dear Mr. Boettcher:

In our letter of September 30, we tried to answer the questions that you asked us concerning Pydraul AC in water. You have asked additional questions which we will try to answer now.

First, you asked if Pydraul AC in a 1-2% emulsion would harm plant life. We feel that it is possible for this material or any other emulsified organic material to cause damage to plants, such as grass, shrubs, etc., if the materials were sprayed directly on the plants and shrubs repeatedly for some length of time.

We have no information from any pollution control board concerning the discharge of Pydraul AC as such. However, with our experience with such boards, we feel that any material containing suspended or emulsified organic substances being discharged directly to a receiving stream would be frowned upon by these agencies. As we told you before, we feel that Pydraul AC would probably drop to the bottom of any water course into which it was discharged if it was not strongly emulsified. However, this does not remove the possibility of this material causing damage to aquatic life or bottom organisms. Such bottom organisms are part of the dynamic food cycle utilized by aquatic life.

We cannot answer your questions concerning whether or not this material can be discharged to a stream because we do not have all the facts available. What is allowed by regulatory agencies to be discharged untreated into receiving streams depends on many factors: the total amount of material discharged, the total amount of dilution available in the effluent and the total amount of dilution available in the stream, or stream flow factors. It is our opinion that it would be economically unsound to discharge sufficient

Pydraul AC into a stream to cause the stream very much difficulty unless it has a very small flow. We cannot, however, answer these questions clearly unless we have information concerning the total volume of your effluent, the total volume of the 1-2% emulsion, other possible contaminants in the effluent, the stream flow with 10 year variations and the classification applied to the stream by the pollution regulatory authorities of Pennsylvania. If we had this information, we could make reasonable calculations as to what concentration of Pydraul AC would ultimately end up in the receiving stream. If this concentration can be calculated then we can determine if concentrations in this range are toxic to aquatic life.

We would be happy to cooperate with you on this problem if you will provide us with the necessary information.

Very truly yours,

Jack T. Garrett
Industrial Hygienist
Medical Department

JTG:dh

cc Mr. Richard Davis
Monsanto Chemical Company

Mr. R. A. Fitch
Gulf Research & Development Co.
Marketing Technical Services Div.
P. O. Drawer 2038
Pittsburgh 30, Pennsylvania

TNGS 007728

MONSANTO CHEMICAL COMPANY

St. Louis - General Offices

J. W. Newcombe - G. O.

November 17, 1959

PYDRAUL AC

Elmer Wheeler - A-2-S

In line with our recent discussion, this is to request studies on the toxicity of discharge air from compressors lubricated with Pydraul AC.

Richard Davis

/pf

TNGS 018544

EXHIBIT NO. 384
Mp 11-28-45

General Offices

Richard Davis-GO
J W. Newcombe-GO

December 16, 1959

PYDRAUL AC VAPORS IN COMPRESSOR AIR

Dr. F. B. Zienty
1700 S. Second Street

Frequently, since we have promoted Pydraul AC as a substitute for petroleum-base lubricants in air compressors, we have been asked to express an opinion concerning the toxicity of vapors of the fluid or lubricant which may be entrained in the compressed air. As you undoubtedly know, the use of supplied air masks or respirators is common in many industrial operations. In the past, the only hazard has appeared to be the presence of carbon monoxide in the compressed air when the compressor air intake was located near a source of carbon monoxide as in the case of portable gasolene-engine operated compressors.

In answer to toxicity inquiries, we have pointed out, without disclosing the composition of Pydraul AC, that we would not expect any detectable concentration of Pydraul AC components to be carried into the compressed air. Further, we have mentioned that good industrial practice dictates that the airline supplying the individuals' masks should include a trap for capturing entrained droplets, foreign material, etc, and further, that such traps usually included a canister filter to remove odors.

We would be in a stronger position to overcome possible sales resistance to the use of a fluid containing undisclosed components if we had analytical data to confirm our opinions. Would it be possible for someone in your Research Department to analyze samples of air for Pydraul AC components? We would be happy to collect the samples from one or more compressors in the Queeny Plant using this fluid.

Elmer P. Wheeler

EPW:dh

TNGS 018543

Phillips
EXHIBIT NO. 385
MP 11-28-95

MONSANTO CHEMICAL COMPANY — Inter-Office Correspondence

2

From LOCATION: St. Louis Organic Research Department

DATE: December 30, 1959

SUBJECT: PYDRAUL AC VAPORS IN COMPRESSOR AIR

REFERENCE:

cc: F. B. Zienty - Res. 1
T. M. Patrick - Res. 2
R. E. Hatton - Res. 1
Richard Davis - Gen. Off.
J. W. Newcombe - Gen. Off.

TO: Elmer P. Wheeler

General Offices

This will summarize the conclusions reached in our conversation regarding analytical work to determine whether toxicologically significant amounts of Pydraul AC components are entrained in compressed air from air compressors lubricated with that fluid.

It was agreed that instead of asking us to do this analytical work, you would request that the Liberty Mutual Insurance Company have this work done in their laboratories for the following reasons.

1. They have personnel who are specialists in this type of analysis and would therefore have methods and equipment set up and ready to do the analyses.

2. The prestige of having the work done in an outside laboratory which no one could accuse of being biased is a valuable consideration.

3. It is your belief that they will do this work for us as a customer service project, thus avoiding cost to us.

It was agreed that, should a considerable number of these determinations become necessary, we would reconsider the possibility of doing the work in our own laboratory.

R. H. Munch

R. H. Munch

RHM:sk

IN 10

TNGS 018556

EXHIBIT NO. 386
MP 11-28-95

St. Louis - General Offices

January 16, 1961

AROCLOR TOXICITY IN POULTRY

K. A. Waddy - G. O.
R. E. Kelly - A-2-S
E. P. Wheeler - A-2-S
J. W. Newcombe - B-2-S
H. S. Bergen - B-2-S
DFS

C. F. Buchanan - B-2-S

I am referring to the attached memos: Ken Waddy to you and H. S. Bergen dated December 29, 1960, and Dr. Kelly to Ken Waddy dated December 30, 1960. These memos speak of the possibility of problems when Aroclor is used in applications permitting contamination of poultry feeds. You have asked for my comments.

1. Heat Transfer. To the best of our knowledge, Emery Industries does not use Aroclor as a heat transfer fluid. Anyway, in this application, Aroclor is generally used in an enclosed system with a relatively low temperature vent away from the operating area and contamination appears remote.

2. PYDRAUL. PYDRAUL AC is used by Ralston Purina at several locations for lubrication of air compressors. We do not know how the air is used, though it's probably to operate pneumatic instruments. It's important to note that drums of PYDRAUL AC are marked "Contains Chlorinated Hydrocarbons". Some tests by our Medical Department performed in 1960 indicated little or no contamination of air with PYDRAUL AC in one compressor (in the Queeny Plant) lubricated with this material.

3. We do advocate the use of Aroclor in petroleum oil blends. We do not know if any oil blenders sell such a product for lubrication of feed processing equipment. However, we have no direct knowledge of such use.

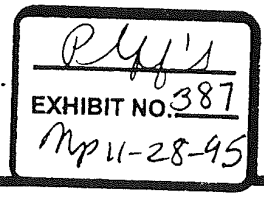
Howard Bergen will no doubt add more information from the standpoint of his applications as an extender for insecticides, as plasticizers, etc.

We plan to take no further action on this subject unless directed to do so.

Richard Davis

/pf

TNGS 018608



APR 19 RECD

MONSANTO CHEMICAL COMPANY

FROM LOCATION: St. Louis - General Offices

cc: J. S. Crawford - St. Louis

DATE: April 18, 1960

SUBJECT: PHILLIPS CHEMICAL CO.

REFERENCE: Philtex Plant
Bartlesville, Oklahoma
PYDRAUL AC

TO: E. P. Wheeler - G. O.

Will you please write to customer direct with carbon copy to J. S. Crawford and me. Please enclose this Pydraul AC booklet for Mr. Hooper.

Richard Davis

/pf
Attach.

From the desk of
J. S. CRAWFORD

Richard Davis
St. L. - Gen. Office
Philtex Plant is
about to convert to
Pydraul AC - from M.O.
Will you please
furnish this?
JSC

TNGS 018562

IN 10

Phillips
EXHIBIT NO. 388
MP 11-28-95

X

BCC Richard Davis - 30

April 20, 1960

Mr. T. E. Hooper
Mechanical Equipment Engineer
Phillips Chemical Company
Philtex Plant
Bartlesville, Oklahoma

Dear Mr. Hooper:

Your letter of April 13 to Mr. Crawford asking for information on the toxicity of Pydraul AC has been referred to me for reply.

Animal toxicity screening studies with Pydraul AC indicate that the oral lethal dose to rats is greater than 52.0 grams per kilogram. In the case of rabbits, the minimum lethal dose was found to be 3.5 to 4.5 grams per kilogram. The difference in toxicity to various animal species is not unusual in the case of our hydraulic fluids. Based on the lethal dose in rabbits, we conclude that Pydraul AC may be considered only "slightly toxic" from the standpoint of accidental ingestion of single doses.

When applied to the unbroken skin of rabbits, the skin penetration lethal dose was found to be between 4.0 and 5.0 grams per kilogram. Again, this indicates a relatively low order of toxicity in terms of accidental exposure to large areas of the skin surface. Skin and eye irritation potential studies in animals indicate that irritation is not a serious hazard. We do recommend, however, that prolonged and repeated skin contact be avoided. In relation to eye irritation, animal studies do not reflect the pain which has been reported when the fluid has accidentally splashed in the eyes of workers. Significant pain and moderate irritation have resulted in the case of such accidents. As would be predicted from experience in animals, no permanent damage to eye tissues or to sight has resulted.

TNGS 018564

EXHIBIT NO. 389
MP 11-28-95

Rats survived six-hours continuous exposure to an atmosphere saturated with vapors of Pydraul AC. This indicates that accidental exposure to massive vapor concentrations presents no serious acute hazard.

We believe that any Pydraul AC carried over in compressed air or gases presents no significant toxicity hazard to humans breathing the air or gas. Certainly, single or limited repeated inhalation exposures cause no effect in industrial uses of compressed air where workers are provided with protective air-supplied respiratory equipment. Any Pydraul AC vapors in concentrations to be toxicologically significant would be objectionable from the standpoint of odor. Even these concentrations would not be significant in terms of possible toxic effects unless the workers were continuously exposed 8 hours a day, week after week, during their working hours.

We believe good industrial practice dictates that compressed air systems providing air to workmen engaged in sand blasting or other industrial operations include air line filters. As I am sure you know, an example of such a filter is one available from the Mine Safety Appliances Company which will remove oil, water, mists and condensation from compressed air, organic vapors and odors.

Enclosed, as you requested, is a copy of our current bulletin on Pydraul AC.

If I can be of any further assistance, please let me know.

Very truly yours,

Elmer P. Wheeler
Assistant Director
Medical Department

EPW:dh
Enclosure

cc Mr. Joe S. Crawford
St. Louis District Sales Office
Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis 66, Missouri

TNGS 018565

MONSANTO CHEMICAL COMPANY

Interoffice

FROM LOCATION: Washington, D. C.

DATE: October 23, 1961

SUBJECT: AROCLORS - FDA

REFERENCE:

cc P.Benignus-St.Lou.
R.Davis-St.Louis
W.Hunt-St.Louis
R.E.Kelly-St.Louis
H.Weingarten-St.Louis
R.S.Wobus-St.Louis
K.H.Maddy-St.Louis

172

TO H. S. Bergen
St. Louis, Missouri

Dr. William Horwitz, of the Food Division of FDA, is hot on the trail of a chlorinated "compound X" which is a causitive factor in chick edema. You will recall in July, I had indicated that O'Dell at the University of Oklahoma was publishing an article in the Journal of Poultry Science which seemed to indicate that Aroclor 1242 used in paint for chicken coops caused chick edema. At that time, we transmitted a sample of 1242 to Horwitz who was unable to find compound X in the sample. This seemed to give our Aroclors a clean bill of health.

Horwitz is now back on the trail. Because of the use of Aroclors as "extenders" for insecticides against roaches etc. in the poultry field, among others, he feels the Aroclor line should be more fully checked out. He called this week indicating that the FDA might like to know all about our Aroclor process of manufacture, our methods of analysis—including chromatographic, our toxicity studies and anything else related to the Aroclors. In addition, he indicated that FDA might desire to send a man to St. Louis to spend some time learning the "Aroclor business". I calmed Horwitz down temporarily by transmitting our latest Aroclor general sales booklet. I indicated if he did not get everything he desired from this booklet, to get in touch with me and I would proceed from there. When Horwitz has had a chance to look over the bulletin, I will be in touch with him again.

What is our experience on the use of Aroclors as extenders in insecticides? I am aware that Deltaville in '59 indicated 1 to 2% Aroclors in an insecticidal formulation such as Lindane for non-crop use seemed to be quite effective. Do we have any later data in this area? I will be in touch when the situation gels here.

C. J. Eby

CJE/mgo

TRAN 012383

Encl:

Ruff's
EXHIBIT NO. 390
MP 11-28-95

MONSANTO CHEMICAL COMPANY — Inter-Office Correspondence

From LOCATION : Pittsburgh
DATE : August 18, 1960
cc :

SUBJECT : CHICAGO PNEUMATIC TOOL COMPANY
Methods for disposing of Pydraul fluids

REFERENCE :

DF

TO : Richard Davis
St. Louis

Mr. S. Facini of the subject company has requested advice on the safe disposal of Pydraul fluids. A copy of his letter is attached.

Could you give us your comments here, please.

J. D. Wright

/m
Attachment

From the desk of
D. F. SMITH

AUG 22 REC'D

Elmer Wheeler
→ A-268-5

When you have answered this could you please send this correspondence back for our files?
Thanks a lot Elmer.

Dale

8/29/60

IM 10

Ruff's
EXHIBIT NO. 391
MP 11-28-95

TNGS 018582

NOV 2 1 '61

X

bcc: W. F. Burggrabe - A-2-
D. J. Murphy - New York
E. P. Wheeler - A-2-
S. U. Shorey - Everett

November 17, 1961

Mr. J. E. Rowland
Chas. Pfizer & Company, Inc.
Groton Plant
Groton, Connecticutt

Dear Mr. Rowland

Thank you for your letter of November 2 requesting information on PYDRAUL AC.

We see no objection to operating your Chicago Pneumatic air compressor with PYDRAUL AC in the cylinders and Gulf Harmony 69 petroleum oil in the crank case. PYDRAUL AC is compatible with Gulf Harmony 69 and leakage of PYDRAUL AC into this oil would form a true solution with satisfactory lubricating properties. If the PYDRAUL AC content of the oil in the crank case reaches 3-5 percent or more, there may be a softening effect on the paint. The amount of PYDRAUL AC in the oil can be monitored from time to time by measuring specific gravity and referring to the chart attached.

Concerning your questions on decomposition products of PYDRAUL AC and the effect of this lubricant on bacterial growth, our medical staff reports:

> 'The decomposition products of PYDRAUL AC can include carbon monoxide, carbon dioxide, water, hydrogen chloride phenols and aldehydes, and undecomposed PYDRAUL AC vapors, depending on the conditions of decomposition such as temperature, oxygen available, period of contact with heat, etc.

Phillips
EXHIBIT NO. 392
MP 11-28-95

TNGS 018631

We have no information about their 'understanding that this material will not support bacterial growth'.

The carry-over of air compressor cylinder lubricant to filters, tanks and other down-stream equipment is usually mostly in the form of micronic size mist. Most of this mist can be removed with an efficient fiber mist eliminator. Enclosed is a reprint of a paper presented by Dr. Brink of Monsanto at the AIChE meeting in Lake Placid, New York in September. On page 3, he specifically mentions bacteria free processes.

With a Brink mist eliminator, carry-over is then reduced to the vapors of the lubricant. This can be minimized by use of HYDRAUL AC as it has a vapor pressure of only 0.0005 millimeters of mercury at 100°F. Even this trace amount of lubricant could be removed with an active adsorbent filter, such as charcoal or alumina, though this should not be necessary.

We believe the combination of the Brink mist eliminator and HYDRAUL AC as the cylinder lubricant will be a practical solution to the goal described in your letter of November 2, 1961. If you would like additional information on the mist eliminator equipment, would you please contact Mr. William Burggrabe at this same address. If you would like additional information on HYDRAUL AC, please let me know or contact Mr. S. U. Shorey at our office in Everett Station, Boston 49, Massachusetts (Dunkirk 7-5010).

Very truly yours,

Richard Davis, Manager
Industrial Fluids Sales

RD:mjt

Enclosure

TNGS 018632

SALESMAN'S CALL REPORT – O[illegible]ANIC DIVISION MARKETING DEPARTMENT — 1 – CENTRAL OFFICE COPY

OFFICE ROUTING – CHECK BOXES

- ☐ FINE CHEMICAL
- ☐ INTERMEDIATES
- ☐ PLASTICIZERS
- ☐ AUTO. FUELS & LUB'S.
- ☐ RESIN MATERIALS
- ☐ PAPER CHEMICALS
- ☒ FUNCTIONAL FLUIDS
- ☐ RUBBER CHEMICALS

ATTENTION OF: Dick Davis

EXTRA COPIES

CUSTOMER NAME: REYNOLDS METALS COMPANY — DATE OF CALL: 4/28/65

STREET ADDRESS: CENTRAL ENGINEERING

CITY AND STATE: RICHMOND, VIRGINIA

☐ NEW ACCOUNT | CALL UNITS THIS CALL | ACTUAL CALLS/UNITS/ THIS YEAR | REQUIRED CALLS/UNITS/ PER YEAR | CHANGE ASSIGNED CALL UNITS TO

ACCOUNT PROFILE CHANGES

CONTACT DATA

ADD	RM	NAME, TITLE, ETC.

MAILING LIST

ADD	RM	MP	MGI	CODE NUMBERS

PRODUCT INFORMATION

MAJOR	GRADE	SPG	PRODUCT NAME	MARKET CODE	UNIT PRICE	TOTAL PURCHASES 1000 LB. LIMITS			SOURCES OF SUPPLY			

FIRST – DICTATE ORDER RECEIVED–DISTRICT ACTION REQUIRED–PERSONNEL CONTACTED — SECOND – REPORT OBJECTIVE–RESULTS–FURTHER ACTION REQ[illegible]

Contacted: Mr. Richard Mansur - Industrial Hygienist

PYDRAUL AC: ATTN: DICK DAVIS

Dr. McClean was out of town for the week, but I was able to contact Mr. Mansur and get some second hand information on the status of Pydraul AC in Reynolds, air compressors. Mansur said that he has settled on a standard of 0.5 milligrams per cubic meter max. allowable phosphate ester in the air. This standard was developed for Cellulube 300 and not for Pydraul AC. Mr. Mansur said that he does not have a standard for Pydraul AC, because this material contains chlorinated hydrocarbons as well as phosphate esters. Now that he has developed a standard, Mr. Mansur is experiencing difficulty in actually measuring an atmosphere to see whether it conforms to this standard. He has reviewed the work which was sponsored by Monsanto and others and found it either to be unsatisfactory or impractical for Reynolds use. Mr. Mansur is now doing some experimental gas chromatography work. Mr. Mansur was quick to point out that setting these standards for the use of a fire resistant lubricant is the responsibility of Dr. McClean. Mr. Mansur merely passes on the acceptability of such standards in the hygiene area. When I asked Mr. Mansur whether or not Pydraul AC is under active consideration at this time, he said that Dr. McClean is rather hesistant to go very far with Pydraul AC due to his own bad experiences with high molecular weight chlorinated hydrocarbons. For himself, I believe that Mr. Mansur is open on whichever material is chosen. He said that any system will have to be watched like a hawk. Mr. Mansur expressed great respect for our hygiene people and what they told him concerning Pydraul AC, but he said that any man-made-system can go out of wack. I will set up a three-way meeting between myself, Mr. Mansur and Dr. McClean on my next visit to Richmond. At this point and time, we do not appear to be in very good position to have Pydraul AC accepted as a corporated standard at Reynolds

DISTRICT OFFICE: WILMINGTON — SALESMAN: HARRY L. DITTY — 5/3/65

S 331 (REV. 4/64)

TNGS 018700

Plaintiff's EXHIBIT NO. 393 MP 11-28-95

St. Louis

July 30, 1965

Pydraul

Mr. Larry Bradford - LBRAD

G. R. Buchanan - GBUCH
R. Davis/D. Smith - RDAVI
L. G. Farrow - LFARR
F. G. Ziegenfuss - FZIEG

I feel we have given entirely too light a touch to the warning paragraphs in the handling and storage section of the reference bulletin. I would recommend that it be worded this way:

Handling and Storage

Animal toxicity studies and human experience indicate that the Pydraul hydraulic fluids may be used safely if a few reasonable precautions are taken.

Repeated or prolonged skin contact should be avoided not only to prevent absorption of the material and possible systemic effect but, also, because the fluids are excellent solvents for the oils normally present in the skin. Thus, drying and irritation could occur.

When splashed or sprayed into the eyes, Pydraul causes painful smarting. There is no evidence, however, of any permanent eye injury. In the event of accidental contact with the eyes, the eyes should be flushed with copious amounts of water for 15 minutes and the workman referred to a physician; physicians have used 1% Pontocaine (R) solution (Winthrop Laboratories) and ophthalmic cortisone acetate solution to relieve irritation.

When Pydraul is kept at room temperature it does not constitute a vapor inhalation hazard except in a confined, unventilated space.

Respiratory protection or mechanical exhaust ventilation should be provided if there is repeated and prolonged contact of the fluid with heated surfaces with resulting volatilization or possible decomposition of the fluid. For short periods, such as might arise in turning off equipment following the rupture of a hydraulic line or other mechanical failure, no such protection is necessary.

Elmer P. Wheeler

EPW/ln

TNGS 019061

EXHIBIT NO. 394
MP 11-28-95

St. Louis - General Offices

March 7, 1966

Breck's Diving School, Warwick, Bermuda -- Air Quality Standards for Scuba Diving

Your Letter of February 16 to Dick Davis

RANDALL GRAHAM
New York

G.A. Buchanan GBUCH
Alan Bades ALADE
Dick Davis/Dale Smith GO
P. Slayton - New York
Joe Brink JBRIN

Dale Smith asked for our comments relative to Mr. Breck's inquiry. I believe there are two pertinent points in your memo. One is that the volume of Pydraul in such applications would be pretty limited. Secondly, I doubt that Monsanto wants to get involved in any extensive studies in connection with Mr. Breck's problem.

In the last 2 - 3 years we have looked at standards for compressed air more from the standpoint of that used in a number of our plants rather than the problem of scuba divers. It is interesting to note that only recently has much attention been given to establishing standards for compressed air for either use. In industry more problems have arisen from connecting a cylinder of some other gas to the compressed air line rather than from contaminants in the compressed air. On the other hand, there have been numerous cases of poisoning and deaths from compressed air in plants where the air entering the compressor has been a source of CO or other toxic material and then distributed around the plant through pressure lines rather than in cylinders.

I would expect that problems which have arisen in scuba diving have been similar in that cylinders have been filled from a filling station compressor where the inlet air picked up CO from an auto exhaust or where a compressor had the exhaust located in a spot close to the air inlet to the compressor.

In January 1964 the Department of Public Health of California issued a publication under the title "Skin and Scuba Diving as a Health Problem." This is made up of about 30 pages. A xerox copy of page 9 which indicates standards for the air is attached. (If Mr. Breck writes to California for a copy of this publication, he will find that the report recommends a water lubricated compressor.)

In February, 1964 the State of New Jersey published regulations governing compressed air used in scuba activities. A xerox copy of their regulations is also attached.

I have enclosed the above in case you wish to send them to Mr. Breck.

TNGS 017683

EXHIBIT NO. 395
11-28-95

Getting back to the question of use of Pydraul, we feel that the hazard is no greater with this lubricant than with an oil lubricant. We have limited data on one compressor at the Queeny Plant where analysis of samples showed no significant contamination in air lines downstream from the compressor. Considerable more sampling would have to be done, however, with many makes of compressors, sizes, conditions of wear, etc. The simplest solution with either oil or Pydraul is to filter the air through commercially available filters which would remove any contaminants in the air stream including rust and particulate matter as well as oil mist, Pydraul mist or decomposition products if the compressor is run at excessive temperatures.

I have returned the original copy of Mr. Breck's letter and will not volunteer to read the text of his proposed book. I am not sure how much of the above you want to forward to him in order to maintain the proper Monsanto image.

Elmer P. Wheeler

EPW:mjb

Monsanto

FROM (NAME & LOCATION): H. S. BERGEN - ST. LOUIS

DATE: April 5, 1968

SUBJECT: Aroclors - Delayed Orders - Allocation

REFERENCE:

TO: DR. C. E. ANAGNOSTOPOULOS
CANAG

CC: P. G. BENIGNUS-PBENI
R. DAVIS-RDAVI
H. J. DAY-HDAY
F. P. GUIGNON-FGUIG
N. T. JOHNSON-NJOHN
J. J. KAGAN-JKAGA
A. L. KLEMM-AKLEM
W. A. KUHN-WKUHN
CUMMING PATON-CPATO
E. S. ROBSON-EROBS
N. L. SAMPLE-NSAMP
W. E. SCHALK-WSCHA
HOWARD TIPPEE-HTIPP
M. T. WHITE, JR.-MWHIT

Manufacturing and Production Planning and Distribution have indicated that our Aroclor plants are presently operating at approximately 99% of capacity and sales demand has increased recently to such a point that demand is outstripping supply.

We have considered some of the various ways in which we can supplement our Aroclor availability without going on an allocation basis to our customers. Based on Herb Day's recent calculations, it appears as though during the period April and May that we will be short approximately 1M lbs., thus indicating about a 94% allocation basis over these two months. Following are some of the ways in which we can possibly prevent this allocation.

1. Inventory reductions

   - Reduce Aroclor 1242 drum inventory
   - Reduce all other inventories (plasticizers and functional fluids formulated) to 75% of the minimum inventory
   - Make shorter blend runs of formulated products and thus avoid excessive inventory at any one point in time

Attention: Norris Sample and Howard Tippee - Would you do all possible in this area and review this subject and let us know what action can be taken.

2. Buy or convert biphenyl to chlorinated biphenyl from overseas sources such as Prodelac and Bayer. We export approximately 600 to 700,000 lbs. a year of formulated Aroclor products in the Fluids area and the Plasticizer Group exports approximately a million pounds per year. So, we could buy this in France or Germany and ship it direct to our overseas customers or we could bring it into the U. S. and get duty drawback. We would prefer,

TNGS 010348

IN 10 REV 11 68

EXHIBIT NO. 396
MD 11-28-95

however, to buy it and ship it direct rather than bring it into the U. S. not only because of the excessive freight costs which it incurs but also because it would alert other manufacturers to the shortage of chlorinated diphenyl in the U. S. There are many possibilities;we could blend F-9 and A-200 at Antwerp or at Dalton or we could sell as such as plasticizers.

Attention: Costas Anagnostopoulos & Bill Kuhn - would you please investigate this further as to feasibility, and if you agree, let's get Purchasing and Antwerp Manufacturing working on this. If Antwerp can't do it, then let's consider Dalton.

3. General Electric has contaminated Aroclor from their transformer production which they have offered us to reclaim. This is some 70 to 100,000 gallons per year and it is quite possible that we could utilize this in some of our formulated product blends.

Attention: Paul Benignus - would you please get samples of this as quickly as possible and work with Dick Davis and Bill Richard to determine the quality of this type of material and whether it is usable or not. Also, please negotiate the best possible pricing if it appears that this might be a feasible method.

4. Obtain extra material from MCL production facilities as soon as it is available. We understand they cannot supply material now until the fall but perhaps by some quick de-bottlenecking or closer scrutiny we might be able to get more out.

Attention: Bill Kuhn - suggest you evaluate this possibility still further.

If all of the above fails and we are forced to go on an allocation basis, Waychoff and I have agreed that the order of priority of shipments for both Plasticizers and Functional Fluids will be:

- Customers receive the first priority
- Distributors receive the second priority

and

- Warehouses the last priority

Walt Waychoff will provide to Production Planning a list of preferred customers for priority treatment and I will provide the same for Fluids. We hope we do not have to come to this.

There is no need to point out the urgency of this situation because it is most urgent. We are already delaying some customers and causing them to shut down their production. Our salesmen are spending a lot of time placating customers when they could be out doing more productive selling. It is arousing the customer's wrath and there is nothing we need more than for them to get irritated at us to put a second source in business. All of us must realize the consequences of our position and do the utmost to secure additional material. The time is urgent. Herb Day is further defining our shortage deficiencies over the next several months and we are waiting for a computer run on this.

We urge all of you to keep our shortage position as confidential and quiet as possible so as not to arouse our customers or competition more than they are.

W. F. Waychoff (mh)

W. F. Waychoff

H. S. Bergen (mh)

H. S. Bergen

/mh

TNGS 010350

Monsanto

FROM (NAME & LOCATION): W. R. Richard - Research Center

DATE: May 20, 1968

SUBJECT:

REFERENCE:

cc: D. Roush DROUS
S. Shaw SSHAW
D, Smith DSMIT
C. Early CEARL
R. Keller - JFQ
H. Bergen HBERG

TO: R. Davis - RDAVI

FF

We now have FDA inquiry for samples of Aroclor, presumably to look for ppm toxicity, and on residues in wildlife.

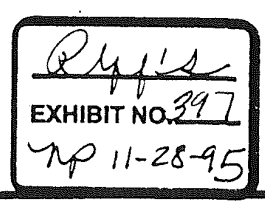
Are we preparing ourselves and customers to minimize or prevent process, stream and air pollution?

WRR

W. R. Richard

ms

TRAN 057590



General Office - St. Louis

May 23, 1968

FDA Aroclor Inquiry

SS/DER
RAG/DPS
C. Early - CEARL
[redacted]
H. Bergen - HBFRG

W. R. Richard - WRICH

The major entry of Aroclor into sewers and streams from industrial fluids applications is in industrial hydraulics. We are prepared to design, install and start up effective fluid recovery systems which remove Pydraul from plant effluent. We have demonstrated this capability thru Findett. A few customers use the system as an economic measure.

If and when more customers are pressed to keep Pydraul out of the streams due to government legislation, we are prepared to act by referring them to Findett or serving as prime contractor, subcontracting to Findett.

Richard Davis

RD/mms

TRAN 086253

EXHIBIT NO. 398
11-28-95

General Office - St. Louis

May 23, 1968 RF

FDA Aroclor Inquiry

SS/DFH
RAG/DFS
C. Farly - CEARL
[redacted]
H. Bergen - HHFRG

W. R. Richard - WRICH

The major entry of Aroclor into sewers and streams from industrial fluids applications is in industrial hydraulics. We are prepared to design, install and start up effective fluid recovery systems which remove Pydraul from plant effluent. We have demonstrated this capability thru Findett. A few customers use the system as an economic measure.

If and when more customers are pressed to keep Pydraul out of the streams due to government legislation, we are prepared to act by referring them to Findett or serving as prime contractor, subcontracting to Findett.

Richard Davis

RD/mms

TNGS 011853

Monsanto

AUG 5 1968

FROM (NAME & LOCATION): W. R. Richard - Research Center

DATE: August 2, 1968

SUBJECT: PYDRAUL 312 SOLUBILITY IN H2O AND STREAM POLLUTION

REFERENCE:

cc. R. Davis RDAVI
R. Garcia RGARC
N. Johnson NJOHN
D. Smith DSMIT
E. Wheeler EWHEE
J. Garrett JGARR

TO: Lou Stark - LSTAR

Do we have solubility of Pydraul 312 in water at say 15 to 30°C? We should have this figure to help our medical department answer questions on stream pollution and recovery of Pydraul. We should also relay numbers on solubility of Aroclor in water.

W. R. Richard

ms

TNGS 018243

Plff's
EXHIBIT NO. 399
MP 11-28-95

Monsanto

FROM (NAME & LOCATION) W. R. Richard - Research Center

DATE August 2, 1968

SUBJECT PYDRAUL 312 SOLUBILITY IN H_2O AND STREAM POLLUTION

REFERENCE

TO Lou Stark - LSTAR

cc R. Davis RDAVI
R. Garcia RGARC
N. Johnson NJOHN
D. Smith DSMIT
E. Wheeler EWHEE
J. Garrett JGARR

Do we have solubility of Pydraul 312 in water at say 15 to 30°C? We should have this figure to help our medical department answer questions on stream pollution and recovery of Pydraul. We should also relay numbers on solubility of Aroclor in water.

W. R. Richard

WRR

Lou,

Carl G did some crude experiments saying < 5 ppm was soluble in water. Possibly we could run some more precise measurements.

I relayed this < 5 ppm to Duke Smith 8/1/68

WRR

TNGS 011860

EXHIBIT NO. 399-A
MP 11-28-95

Richard Davis - St. Louis

January 23, 1970

P. G. Banigan
[redacted]
W. A. Richard-WRIC

DRP for File - Reclamation

PCB POLLUTION

W. B. Papageorge
WPAPA

Clint Kemp may have a practical, low cost method for reducing Aroclor content of plant effluent streams. It appears to work with petroleum oil in water and will be checked with Pydraul 312 and Aroclor 1242.

The method is filtration of the stream through sand which is treated (by the Vapocoupling process) to have an organophilic surface. The oil or fluid is released from the sand by raising the pH. The organophilic nature of the sand is restored by lowering the pH.

You may want to check with Clint Kemp to explore this idea further.

Richard Davis

/deb

Samples of A200, 312 & 1242 sent to Kemp for evaluation week of 1/19/70.

EXHIBT NO. 400
MP 11-28-95

TNGS 011899

Monsanto

FROM (NAME & LOCATION) W. R. Richard - Research Center

DATE December 30, 1968

SUBJECT AROCLOR - WILDLIFE

REFERENCE

TO W. A. Kuhn - WKUHN

cc H. Bergen HBERG
P. Hodges PHODG
E. Wheeler EWHEE
E. Tucker JFQ
D. Olson DOLSO
R. Kountz RKOUN
R. Davis RDAVI
W. Johnson WJOHN

Bill, you wanted to become more familiar with the legal-political problems facing Aroclor with regard to pollution and the accusations in the literature that chlorinated biphenyls are poisoning and killing wildlife.

These wildlife people have to be taken seriously. They have taken the DDT industry to court in Wisconsin to prevent the use and sale of DDT in Wisconsin and if they win in that state, DDT will be banned in many others. This case was on National Television last week. The wildlife people are dedicated to the demise of DDT.

Our problem is that Aroclor has been "identified" along with DDT residues and hence we are almost certain of being drawn into the court records and may also be one of the scapegoats of the DDT defense. The wildlife people have accused Aroclor of doing all the bad things of DDT.

We are taking 3 steps to protect ourselves. Scott Tucker and R. Keller are to repeat some of the analytical identification work feeding Aroclor to chickens and seeing if Aroclor is really present as "shown" by the literature. I hope we have been falsely accused but maybe Aroclor is present.

E. Wheeler is having feeding tests done on animals to establish a "safe" level for Aroclor feeding. If we can find a "safe" level Calandra's Lab will do 2 year experiments on animals including effects on succeeding generations. This will help a bit but the wildlife people won't be stopped by this kind of evidence.

TRAN 057684

IN 10 REV 11 65

Groves, wildlife

The third step is to minimize exposure of Aroclor, to reduce air and water pollution, to restrict Aroclor to uses which can be controlled. This is the only way I see to survive.

I believe we should make sure that our plants have minimum air or stream pollution. I believe Anniston is vulnerable and that off-gas HCl and Aroclor should be 100% controlled. Krummrich may also need help.

I believe we should demonstrate that Aroclor can be incinerated to harmless products for disposal.

I believe we should help our customers dispose of off-grade or non-reworkable Aroclor, either by incinerating or by toxic dump.

I believe plasticizer group marketing should know where their product is going and be able to minimize exposure risk if Aroclor has truly been identified as a pollutant.

We probably have 6 months to 1 year while they fight out the DDT case. I want to use this time to minimize our exposure. We will need your help in setting TSD targets.

Bill R.

W. R. Richard

ms

TRAN 057683

170

Monsanto

FROM (NAME & LOCATION): W. R. Richard - Research Center

DATE: May 13, 1969

SUBJECT: AROCLOR - ANALYSIS IN PESTICIDE RESIDUES

REFERENCE: (Visit to Prof. O. Widmark U. of Stockholm - May 5, 1969)

TO: File

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Widmark was finding

Cl_8 and Cl_9 chlorinated biphenyls from extraction of salmon and from extraction of waste sewage sludge.

Low Cl_7 and Cl_8 chlorinated biphenyl
Some Cl_{10} " "
No Cl_{11} and Cl_{12} " "

This corresponds roughly to Clophen 50 or Aroclor 1254.

The isomers found in nature are not the same ratios as in either Aroclor 1254 or Clophen 50.

Widmark has examined 2000 samples from the Baltic Sea. Another group of ecologists is examining the sea around Scotland. Their results are a bit different according to Widmark's knowledge.

Widmark had been in contact with transformer manufacturers in Sweden. They reported very low loss of chlorinated biphenyls, an occasional spill. Widmark kept hitting at marine paints as a source of the product.

He wanted Monsanto to restrict sale to those closed system applications. He asked if the economic value of PCB's was worth the bad publicity which would come to Monsanto.

We countered with a question. What products would he recommend as substitutes? What kinds of synthetic compounds are biologically acceptable? Would he help establish a safe tolerance level of synthetic compounds in wild-life?

TRAN 009835

He reported that he had not isolated or found much chlorinated biphenyl with 1 through 4 Cl atoms. This might be because Aroclor 1242 and below is more biodegradable; (or it could be due to the analytical isolation and separation methods; or perhaps Aroclor 1242 is less exposed in the world.)

Widmark is dedicated to better and more accurate analysis. He is in sympathy with most of the ecologists demanding elimination of chlorinated pesticides. His knowledge of scientific evidence and its requirements makes him slightly hesitant in condemning Aroclor itself or demanding its total eclipse.

Keller and Wheeler should have a more complete report.

Widmark reported not finding chlorinated naphthalene, chlorinated paraffin, chlorinated benzene, chlorinated terphenyl. He thought he had identified and accounted for 80% or more of the lipid soluble extractable chlorine containing compounds.

Based on these remarks of Widmark we might consider alternate products and actions.

What is the Cl_5 and Cl_6 content of Aroclor 1242?

The Aroclor 1242 has 31% dichloro,
53% trichloro
16% tetrachloro

The Cl_5 content must be very low in our present material. If Aroclor 1242 is indeed biodegradable we might restrict usage to minimize and control its concentration in nature to acceptable levels.

However, the use of Aroclor 1248, 1254 and 1260 would seem to require further restrictions in exposed systems.

Scott Tucker reported that Aroclor 1242 could be destroyed by HNO_3/H_2SO_4 treatment. Widmark may or may not have been destroying Aroclor 1242 before his analysis.

We could also expect that $Cl_5Ø$ might go undetected based on Widmark's evidence; and apparently chlorinated paraffin and chlorinated terphenyl have so far escaped detection or are absent in the tissues of birds or fish.

Again, Keller and Wheeler should have a more complete report.

WRR.

W. R. Richard

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Aroclor - Biodegradation

RUABON VISIT

I talked with R. Baxter, J. H. Mainprize and R. A. Lidgett at Ruabon. They had reviewed the literature and had received samples of Aroclor from St. Louis, isomers 24', 44', 22'4'4' and Aroclor 1242, 1254, and 1260. We asked that they examine these for microbiological degradation.

R. A. Lidgett said he would have to develop an analytical method. I would hope that collaboration with Scott Tucker on-method or on actual sample analysis could speed this up. We would like some indication of biodegradability, especially on Aroclor 1242.

WRR

W. R. Richard

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from the desk of

WILLIAM RICHAR

TRAN 057163

To CEA 5/15/68

Bob Kelly is working on these analytical methods so we can identify Aroclor if necessary.

Dr Kelly seems correct. We are hoping to lose slowly. Any info we get which is detrimental must be reported so why pay for it.

I believe we should do everything to control exposure of Aroclor to maintain both our position and our customers.

This is why I can't see Therminol FR in Stack gas process.

WAR.