HEARING

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)
	)
Application for	)
Certification for the	) Docket No. 98-AFC-4
SUNRISE COGENERATION AND	)
POWER PROJECT (SUNRISE)	)
_____	)

CALIFORNIA ENERGY COMMISSION

FIRST FLOOR HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

THURSDAY, DECEMBER 2, 1999

9:00 A.M.

Reported by:
Debi Baker
Contract No. 170-99-001

COMMITTEE MEMBERS PRESENT

Michal Moore, Presiding Member

David Rohy, Vice Chairman
Associate Member

STAFF PRESENT

Gary Fay, Hearing Officer

Bob Eller, Adviser to Vice Chairman Rohy

Shawn Pittard, Adviser to Commissioner Moore

Caryn Holmes, Senior Staff Counsel

Marc S. Pryor, Siting Project Manager

Rick Tyler

David Flores

REPRESENTING THE APPLICANT

John P. Grattan, Attorney
Scott A. Galati, Attorney
Grattan & Galati
Renaissance Tower
801 K Street, Penthouse Suite
Sacramento, California 95814

David M. Einolf, Principal
Dames & Moore Group
700 Northeast Multnomah, Suite 1000
Portland, Oregon 97232

Ray Weiss
Jones and Stokes Associates
2600 B Street
Sacramento, California

INTERVENORS

Katherine S. Poole, Attorney, representing CURE
Adams Broadwell Joseph & Cardozo
651 Gateway Boulevard, Suite 900
South San Francisco, California 94080

INTERVENORS

J. Phyllis Fox
Environmental Management
2530 Etna Street
Berkeley, California 94704-3115

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P R O C E E D I N G S

9:00 a.m.

PRESIDING MEMBER MOORE: Good morning. I'm Michal Moore, for the record, I'm a Commissioner here at the California Energy Commission and I am the Presiding Member on the Sunrise Cogeneration Project Committee.

I'm going to ask you to bear with us this morning a little bit. The sound system is turned off. The sound system will be on again in a few minutes. But we are recording all of this, so I'm just going to try and speak up. I'll ask Mr. Fay to speak up, as well, from up here. And ask you, as well, to just enunciate as clearly as you can until we get the system back on. You are recording just fine at normal sound levels.

So, with that I'll tell you that this hearing will be truncated a little bit today. We'll be stopping at or before noon because I and Commissioner Rohy have a commitment that we simply can't get out of at this point. So we'll take as much of the testimony as we can and we'll return tomorrow to wrap up. We'll have me tomorrow, Commissioner Rohy will not be in attendance.

I'm joined on the dias today by my Aide,

Shawn Pittard on my left, Gary Fay, our Hearing Officer, on my right, and Bob Eller to the far right. Commissioner Rohy will be with us in just a moment.

Today we are going to be continuing evidentiary testimony in the area of traffic and transportation, and should we get to it, worker safety and fire protection.

With that, I'm going to turn to Mr. Fay and ask him to introduce the topic today a little more formally, and then we'll begin the evidentiary hearing. Mr. Fay.

HEARING OFFICER FAY: Thank you, Commissioner Moore. Today's hearing was previously noticed to all the parties to deal with these two topics that the Commissioner noted.

I'd like to take up some housekeeping matters first before we get started. I inadvertently did not identify the testimony of David Larson of Navigant Consulting, who is a consultant to TANC. And that testimony was entered at our last hearing, and that should be noted as exhibit 39.

Now the applicant suggested the use of that number for one of their exhibits, but exhibit

39 is the Larson testimony, and so we will continue with the next exhibit in line being exhibit 40.

In addition, the next evidentiary hearing we have scheduled, and a notice will probably go out tomorrow on this, so we may be able to get copies to you at tomorrow's hearing, will be for January 10th, 11th and 13th next year, year 2000.

And the topics will be air quality, public health, biological resources and soil and water resources. The staff will be filing its testimony in three of those areas on Friday, December 17th. They have already filed their testimony in biology. And the other parties are directed to file their testimony no later than Monday, January 3rd.

Are there any questions regarding that? Okay. Ms. Poole?

MS. POOLE: Yes, Mr. Hearing Officer, I have a couple of questions. One concerns the feasibility of this schedule. And our concerns are primarily that we understand that the San Luis Obispo County Air Pollution Control District will be intervening in this case. And their concern is

that the San Joaquin Valley Air District is a major contributor to ozone transport problems in that air district.

And they, as I understand it, would like the Commission to address that problem. And I'm wondering whether that can be done within this schedule.

We have also appealed the conditional final determination of compliance that's been issued by the San Joaquin Valley Air District, and don't think that that's the final air permit that we can proceed to hearings on.

We're also concerned that the evidence that we have in the water area right now indicates that Texaco is disposing of, and Valley Waste is accepting, hazardous waste discharges. And that DTSC needs to weigh in on that issue.

And that issue also touches on biology, whether animals that are perhaps drinking out of the wastewater discharge ponds are suffering adverse effects.

And given those issues, I'm not clear on how staff can meet this December 17th deadline. So, I guess I should --

HEARING OFFICER FAY: Okay, since you've

raised the question, why don't we see if staff has a response. Ms. Holmes.

MS. HOLMES: I'm sorry, I have to apologize, I was talking to Mr. Pryor and I didn't hear the specific concern about the wildlife issue, having to do with the wildlife drinking from the ponds.

MS. POOLE: The wildlife issue is one that we raised at the biology workshop.

MS. HOLMES: Right.

MS. POOLE: And it's related to wildlife, the effects on wildlife of drinking potentially hazardous waste.

MS. HOLMES: Right, and it's my understanding that that is going to be covered in the staff testimony that will be filed on the 17th.

MS. POOLE: Okay.

HEARING OFFICER FAY: And, the other areas, as well? Staff will be addressing these? Ms. Poole mentioned water concerns, that they're also appealing the final DOC. Does staff still intend to file --

MS. HOLMES: Staff still has to file. I don't know that our air testimony, for example,

would address the implications of the appeal of the DOC. But we do intend to file our testimony.

MS. POOLE: And it can be final without a final air permit?

MS. HOLMES: That's probably a legal question that the Committee and perhaps the parties will have to address. I just found out about this issue this morning, and I had not looked into it at all. I don't know if the applicant has a view on this matter or the Committee has a view on this matter.

MR. GRATTAN: We certainly have a view.

HEARING OFFICER FAY: And if there's nothing further from staff, we'll hear that view. Anything further, Ms. Holmes?

MS. HOLMES: Nothing.

HEARING OFFICER FAY: All right, Mr. Grattan.

MR. GRATTAN: Yes, let me address those issues one at a time. The intervention of the San Luis Obispo Air Pollution Control Officer, or the rumored intervention. We have nothing in the record that indicates that the San Luis Obispo Air Pollution Control Officer intends to intervene. What we have is a suggestion that he may

intervene.

Next, my reading of the regulations indicates the time period for intervention is over. That the time for intervention is when the prehearing conference statement is filed. That was months ago.

Next is the appeal of the determination of compliance from the air district. We haven't seen that appeal. I guess it hasn't been docketed. Staff hasn't seen that appeal.

We heard rumors of that appeal. It sent me to check the District regulations and to check the Commission regulations and the Warren Alquist Act.

And our view is that the District regulations do not specifically sanction an appeal of a determination of compliance. And in that case, where there is a void, so to speak, in the District's regulations, we have to look to the regulations of the agency, the state agency that has primacy over the siting of power plants.

And any interpretation of the District regulations, which would permit the state's regulatory schedule of 240 days for a final DOC, would have to be interpreted as not authorizing

that.

Even if the appeal were authorized, that's sort of a double bite at the apple. The Commission's proceedings clearly authorize this Commission to be the final determinate -- the one who finally determines the validity of the air pollution control conditions, and the authority to build the project under the emission and BACT limits that this Commission determines.

So we don't think that appeal is valid. And even if it were valid, we don;t think this should deter the Commission from performing its statutory duty.

And finally, water. We're prepared to go to hearing on water. We have the burden of proof. And I think staff is ready to go to hearing on water.

HEARING OFFICER FAY: And biology, as well?

MR. GRATTAN: Biology, as well.

HEARING OFFICER FAY: Okay. Anything further on that, then? I've heard nothing to indicate that we can't go forward as I indicated in the notice.

So that pretty much covers, I believe,

our housekeeping. Any other sort of prehearing conference level comments before we open the hearing for taking evidence?

MR. GRATTAN: Is this the appropriate time for us to get into the rest of the schedule?

HEARING OFFICER FAY: Sure, I think so, yeah.

PRESIDING MEMBER MOORE: We're open to it.

MR. GRATTAN: We see by going to hearing in the second week in January, counting forward, that the 12-month statutory deadline will be blown if we do that.

Honestly, I can't see how we can have the hearings before that if the staff report is coming out on the 17th. But what we would urge is that if an extension, if the applicant is going to grant -- authorize an extension --

PRESIDING MEMBER MOORE: Request an extension.

MR. GRATTAN: -- request an extension, excuse me, then we would like to see a very tight schedule beyond the hearings. And we would like to insulate as much as we possibly can against further delay.

PRESIDING MEMBER MOORE: Your request is noted, sympathetically. And I'll treat it as seriously as I possibly can. I promise you that as tight a schedule as we can run, I intend to do that.

I can't control any of the external circumstances, you know that.

MR. GRATTAN: That is --

PRESIDING MEMBER MOORE: And especially when it gets into the air quality area, what I seem to be spectacularly unable to do is to control the actions of any of the outside agencies.

So I'll run it as tightly as I possibly can.

MR. GRATTAN: And I would urge, again, with the air quality issue I would urge that the Commission take seriously the authority that the Warren Alquist Act gives it in that specific area.

PRESIDING MEMBER MOORE: All right, noted.

HEARING OFFICER FAY: Anything further, then?

MS. POOLE: May I make one more comment on the air quality topic.

HEARING OFFICER FAY: Sure.

MS. POOLE: Mr. Grattan, to some extent, made my point. What the air district has issued, by its own terms, is not a final DOC. It's a conditional final DOC.

They have said that the applicant has not met district rules. They're giving them through the PMPD comment period to meet district rules. I don't see how the parties can possibly determine that the air permit will comply with LORS, or provide adequate mitigation if we don't have a final permit until that point.

HEARING OFFICER FAY: Does the staff have a position on whether it is appropriate for the Committee to move forward, I presume keeping the record open to receive closure on the DOC prior to certifying the project, but to move forward on the Presiding Member's Proposed Decision before that final closure occurs from the district?

MS. HOLMES: I'm not quite sure I understand your question. Staff's testimony, as filed on the 17th of December, will reflect the fact that the DOC that's been issued says that there is noncompliance with certain requirements.

I think that staff would recommend that we not proceed to the PMPD portion of the siting process until the violations are cleared. But that's really a policy matter, it's not a legal matter.

PRESIDING MEMBER MOORE: Understood, and I trust that the parties also understand that we won't make that decision here at the Committee level until we get closer to the PMPD period. So, it won't be a -- we caution everyone to not expect a decision on that policy matter until later. Certainly until after we've seen the full staff recommendations that are coming out on the 17th.

But, in any case, the final policy decision on that is going to await a lot more pieces of the puzzle to fall in. So, your objections are noted.

All right, we'll begin the evidentiary hearing.

HEARING OFFICER FAY: Mr. Grattan, are you prepared to move forward?

MR. GRATTAN: Yes, we're prepared to move forward, and Scott Galati is going to go forward with that.

HEARING OFFICER FAY: Okay.

MR. GALATI: At this time I'd like to call our witnesses as a panel for traffic and transportation. That would be Mr. Ray Weiss and Mr. Dave Einolf.

HEARING OFFICER FAY: I believe Mr. Einolf has previously been sworn, and I'll remind you that you remain under oath.

Has Mr. Weiss been sworn?

MR. GALATI: No, he has not.

HEARING OFFICER FAY: Would you please swear the witness.

Whereupon,

RAY WEISS

was called as a witness herein, and after first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GALATI:

Q Mr. Weiss, would you please give us your name, address and employment for the record?

MR. WEISS: Yes. My name's Way Weiss. I'm employed with the environmental consulting firm of Jones & Stokes Associates. Their address is 2600 B Street, and they're located here in Sacramento.

MR. GALATI: Mr. Weiss, can you briefly summarize your qualifications for the Committee?

MR. WEISS: Yes, received my bachelor of arts degree from Sacramento State University in economics. I've worked with Jones and Stokes for five years. During that time period I've prepared a number of traffic and transportation analyses, both for a variety of different public and private clients, and a variety of different projects. Mostly infrastructure related, wastewater treatment, pipeline projects. But I've also prepared regional transportation plans for different planning departments.

MR. GALATI: Mr. Weiss, have you prepared and previously submitted written testimony in this AFC proceeding?

MR. WEISS: Yes, I prepared the testimony on traffic and transportation as part of the applicant's testimony package.

MR. GALATI: And are you sponsoring any exhibits today?

MR. WEISS: Yes, I am. I'm sponsoring exhibit 1, which is the AFC and revision, section 8.10; exhibit 2, which is the transmission supplement 2, section 3.10; exhibit 5, which is

the responses to CEC data requests, responses 99 through 103; exhibit 7, Sunrise comments on the PSA, that's pages 39 through 42; and exhibit 11, which is the Sunrise Cogeneration Facility transportation impact analysis of construction impacts at intersection of State Route 119 and Midway Road.

MR. GALATI: Can you affirm your previously submitted testimony under oath today?

MR. WEISS: Yes, I can.

MR. GALATI: Do you have any corrections or modifications to that testimony?

MR. WEISS: No, I don't.

MR. GALATI: Would you please summarize your testimony?

MR. WEISS: Yes. As described in the AFC, the Sunrise project will comply with all applicable laws, ordinances, regulations and standards. I've conducted an analysis of the anticipated traffic impacts on the local roadways associated with both construction and operation of the proposed Sunrise project.

Operation of the Sunrise Cogen facility will not adversely affect the ability of the local roadways to accommodate both traffic associated

with workers and with deliveries to the site during its operation.

My analysis for the intersection showed that there would be a short-term traffic-related impact at the intersection of State Route 119 and Midway Road. In particular the eastbound left-turn movement from Midway Road onto State Route 119.

This would occur during the PM peak hour period, and it would occur during the average and the peak construction phase of the project.

In addition, I've reviewed the final staff assessment. And I agree with the assumptions, the analysis and the conclusions of the recommendations of the conditions of certification including both the staff-proposed and modification to Trans8.

It is my professional opinion that the short-term construction-related impacts identified by the project, by myself and the staff, will be adequately mitigated by the proposed conditions of certification, as modified.

MR. GALATI: Mr. Weiss, I'd like to direct your attention to the staff-recommended conditions of certification Trans7.

MR. WEISS: Okay.

MR. GALATI: And if you could -- that provides that a flagman and/or sheriff could be used to mitigate the short-term construction impacts, is that correct?

MR. WEISS: That's correct.

MR. GALATI: Is it your understanding that Sunrise intends to use a flagman to comply with Trans7?

MR. WEISS: That's my understanding.

MR. GALATI: What I'd like to do now is go through Mr. Einolf's direct before I turn over to the panel for cross-examination.

DIRECT EXAMINATION

BY MR. GALATI:

Q Mr. Einolf, please give your name, address and current employer.

MR. EINOLF: My name is David Einolf. I am employed as an Engineering Manager for Dames & Moore, Incorporated, at 700 Northeast Multnomah in Portland, Oregon.

MR. GALATI: And if you could just briefly refresh the Committee's memory on your qualifications?

MR. EINOLF: I'm Environmental Health

and Safety Consultant with a masters degree in biochemistry. My professional practice is primarily in anhydrous ammonia safety, process safety.

I've been responsible for the development of more than 30 process safety management programs for ammonia refrigeration, storage, handling and processing facilities.

I've completed more than 40 process hazard analyses for hazardous material systems including anhydrous ammonia. I'm a member of the International Institute of Ammonia Refrigeration, Refrigerating Engineers and Technicians Association, and the American Institute of Chemical Engineers.

MR. GALATI: Have you prepared a previously submitted written testimony in this AFC proceeding?

MR. EINOLF: I prepared the supplemental testimony on traffic and transportation as part of the applicant's testimony package. And previously testified as part of the hazardous materials section.

MR. GALATI: And are you sponsoring any exhibits today at this hearing?

MR. EINOLF: Yes, I'm sponsoring supplemental testimony on traffic and transportation.

MR. GALATI: I'd like to ask Mr. Fay if we could mark that as exhibit 41 -- well, actually 40 would be next in order.

HEARING OFFICER FAY: Yes, exhibit 40 then will be Mr. Einolf's testimony, his supplemental testimony.

MR. GALATI: Thank you.

Can you affirm that testimony under oath today?

MR. EINOLF: Yes, I can.

MR. GALATI: Do you have any corrections or modifications to that testimony?

MR. EINOLF: I don't believe I do.

MR. GALATI: Now, would you please summarize your testimony for the Committee?

MR. EINOLF: Certainly. I previously testified before the Committee in the hearing on hazardous materials regarding ammonia, handling, storage and transportation. And I filed some supplemental testimony concerning ammonia transport in preparation for today's hearing.

With respect to a transportation

accident in the delivery of ammonia to the Sunrise project, we conducted an analysis incorporating industry standards and EPA guidance and calculated a probability that an ammonia truck would have a release rate of 8.5 times 10 to the sixth, or 8.5 times in one million per year.

Our worst case analysis assumed that the entire contents of an ammonia tanker, 7500 gallons, would be released over a ten-minute rate, within a ten-minute period. That was the material that was provided in the previous testimony.

This probability only addresses the likelihood of an accident and not the probability of any individual exposure. The probability of exposure would be much less than the probability of an accident, because specific limited meteorological conditions would need to exist simultaneous to the accident because of the large distance, the large radius distance that was in our analysis.

Our analysis was also extremely conservative for the following reasons: Firstly, it is highly unlikely that a tanker would be arriving at Sunrise project completely full at the 7500 gallons, because that exceeds the amount of

storage at the Sunrise project, as we discussed previously in the hazardous materials testimony.

Deliveries tend to be made on an exclusive basis, that is tankers are weighed at the point of consignment and then they are pumped. There's no specific metering device for somebody to know how much is delivered. So, from a financial standpoint that's the way that's happened.

We reviewed available databases for reporting ammonia release, and indicate that a total release of a full ammonia tanker over a ten-minute period has not occurred in 20 years since the inception of the reporting system.

In the period from 1993 to 1998 there have only been four incidents in California involving anhydrous ammonia releasing less than a half a gallon of ammonia in total in transportation.

There have been no reported releases of ammonia in the past years of road transportation in California, of ammonia.

We used generalized nationwide data for vehicle failures that are generally higher in California data because of the fact that

California's weather is generally significantly better than the rest of the nation.

I also reviewed the final staff assessment for traffic and transportation in the hazardous materials section, and I agree with staff analysis for traffic and transportation and the hazardous materials section and I agree with staff's analysis conclusion and proposed mitigation, and believe that the Sunrise project will comply with all applicable LORS, and therefore will not pose a significant risk to the public or the environment.

I also reviewed the testimony of Dr. Phyllis Fox, and I disagree with some of her assumptions, analysis and conclusions for the following reasons:

Firstly, aqueous ammonia, I disagree that the substitution of aqueous ammonia will reduce the risk of accidents because the number of shipments to the facility would increase by about a factor of five, and accidents, as well as resulting injuries and fatalities, are generally a function of vehicle miles traveled, not the commodities transported.

Rural road use. I disagree with

Dr. Fox's recommendation that the routes be restricted to rural roads or within 50 miles of the site, because it is unnecessary. And rural routes generally pose a higher incident of accidents than freeways or highways.

Highway transportation has a lower frequency of accident occurrence than rural routes, and the Sunrise transportation routes maximize the use of divided, controlled-access freeways.

The Kern County General Plan circulation element in policy number 3 provides a policy directing the shipment of hazardous materials away from rural roadways and towards highways and freeways. And freeways are designed to avoid or minimize transit through urban population areas in terms of transit times.

Restricting travel times. I also disagree with Dr. Fox's recommendation to restrict travel times, because it is not necessary in trying to avoid traffic congestion to reduce the likelihood of an accident. It may increase the number of sensitive receptors, that is more people in their homes and dwellings, and also perhaps asleep, during any accident time.

General California history of transportation. I also disagree with Dr. Fox's assumption concerning the risks of ammonia releases during transportation in California. I interviewed Mr. Jerry Bingham, the Safety Director of Bulk Transportation, and he told me that neither his company nor Button Transportation, who are the two major transporters of ammonia in the State of California, have had a release in the transportation of industrial ammonia during the 22 years that he has been in the business.

I also disagree with Dr. Fox's comparison of industrial ammonia delivery to agricultural ammonia delivery. Industrial deliveries are carried out by experienced, professional drivers whose sole occupation is the delivery of hazardous materials. Whereas, agricultural drivers are often assigned to apply chemicals in farm fields after their allotted road time, and therefore may drive with little or no sleep during the peak fertilizer season.

Data from 1990 to 1998 indicates that seven injury accidents nationwide were associated with the transport of ammonia. Six of the seven involve agricultural shipments, and none occurred

in California. That's the analysis of Dr. Fox's data.

Drivers of agricultural ammonia shipments may also not apply with all applicable USDOT and state hazmat requirements.

The analysis that we developed uses factors that incorporate incidents from both agricultural as well as industrial deliveries by focusing on the probability of a tank failure.

I also disagree with Dr. Fox's recommendations concerning the use of different transport containers, because MC-331 tanker trucks are the safest way to transport ammonia. They're designed solely to transport gases that are liquified under pressure, and have a wide range of safety devices including internal check and excess flow valves.

Within the State of California Button and Bulk Transportation ship only LPG and anhydrous ammonia in these tanks. The tanks are required to be tested for leaks annually, and pressure tested hydrostatically every five years.

As I testified earlier, the two companies that transport the majority of anhydrous ammonia in the State of California have not had a

release for at least 22 years.

Lastly, in terms of different containers, the use of different containers will increase the number of shipments to the site.

I also, relative to transportation, all three of the potential ammonia companies that are discussed relative to the applicant's providers, that may deliver anhydrous ammonia to the site, participate in the California Fertilizer Association Ammonia Transportation Safety Program recommended by Dr. Fox.

Although participation in this program is voluntary, it is unlikely, for both competitive and insurance reasons, that any of these transporters would drop the program.

I believe that the Sunrise project, as currently designed, and with the incorporation of the CEC Staff's proposed conditions of certification, will comply with all applicable LORS, and therefore will not pose a significant risk to the public or the environment.

MR. GALATI: Mr. Einolf, with respect to your review of Dr. Fox's testimony, let's start first with data that she uses. Do you have any opinions regarding the data that she's relying on?

MR. EINOLF: Well, the major opinion that I have relative to the data is that the data that's used is data from what is known as the National Response Center. It is not data from the U.S. Department of Transportation.

The U.S. Department of Transportation requires that all transporters of hazardous material upon having an accident, meeting several conditions including any release of hazardous materials, file what's known as a DOT form 5800.1. Those forms, at least from the period of 1993 to 1998 have all been compiled electronically and that material is available as searchable database for products, which is how our analyses of this data were performed that's included in the supplemental testimony.

Dr. Fox's transportation data is from the National Response Center, which is maintained by the U.S. Coast Guard primarily for emergency response to industrial accidents, and covers, by and large, primarily industrial situations and industrial accidents.

The incidents that are recorded in Dr. Fox's exhibit, each and every one of those accidents was never finally reported -- this is

exhibit 6 to her testimony -- they were never finalized with the NRC.

What that tends to mean is that these were reports made by a fire department or by an emergency responder on the scene. They often contain erroneous information, both positive and negative. For example, no release when there may have been a release. Or overestimating the release when the release -- in a situation where the release might have been much less.

MR. GALATI: So your opinion is that the HMIS data, which is specific to transportation of hazardous materials, is superior to the data Dr. Fox relies on?

MR. EINOLF: That's correct.

MR. GALATI: And how about in your review of Dr. Fox's testimony did you review any of the assumptions that she made in calculating the probabilities?

MR. EINOLF: Yes, I did. In the analysis on page 8 and following of her testimony, there are specific assumptions made, relative to both the quality of the data provided by the applicant in the testimony in the AFC, excuse me, and in data responses, and another calculation

relative to ammonia releases.

Firstly, she does make the point relative to Baldock that the data that was used, which is what we used, which was an estimate predicated on a certain size, does not include the size and type of carriers. We examined that information and determined that the discussion was specifically of a tank. Again, a tank could be a large MC331, which is a traditional tractor/ trailer, or what is known as a bobtail, which is a slightly smaller vehicle that's used often in double -- in those jurisdictions that allow it, for double-carry.

And we feel that this information, in terms of one in 2000 tanker years, is a valid number, at least in the year that the analysis was made, in 1980.

The second assertion made is that most transportation accidents are not reported, and that the hazardous material emergency responders for the ammonia group indicated that less than 50 percent of hazardous materials transportation accidents are reported.

In terms of major industrial ammonia shipment, my opinion and the opinion of my

colleagues who are involved in the analysis, is that any shipper who is shipping in an industrial situation who doesn't report runs the risk of losing their license to actually continue to transport that material.

And I don't think that Bulk or Button Transportation in California or any of the major transporters of anhydrous ammonia would jeopardize their livelihood and their future profession to continue to do that. The newspapers are full of problems that people like Federal Express and United Parcel Service have had with hazardous materials transportation, even in small amounts. I think that a release of ammonia, the releases of ammonia, at least in the data that we analyzed, the six years from 1993 to 1998, are very accurate.

Dr. Fox, because of that, took the 13 incidents that she had reviewed, which as I indicated before were speculative, the majority of them were agricultural ammonia shipments of one form or another, and doubled that number from 13 to 26 to develop a number. That just, again, pushes the numbers well above other printed material that we've seen.

MR. GALATI: Do you have any other comments on any assumptions that Dr. Fox made in her analysis?

MR. EINOLF: In order to benchmark or to assess our analysis, quite a lot of emphasis was placed on a prior study, which had been completed by Arthur D. Little in 1992.

That study is simply referenced in several of the exhibits, exhibit 3 and exhibit 4 of Dr. Fox's testimony. We were not provided with a copy of that, nor do we have an feel for what the assumptions were used to develop that number, which is 1 in 8.7 million vehicle miles traveled in terms of a complete release of ammonia from a vehicle.

That study has been bandied about quite a bit in documentation over the years. And I will call your attention to a comment made relative to the study in one of the exhibits, in exhibit 3, the Southern California Edison Redondo Generating Station report on page 3-55.

In that --

HEARING OFFICER FAY: Excuse me, Mr. Einolf, --

MR. EINOLF: Yes.

HEARING OFFICER FAY: When you say exhibit 3, are you referring to --

MR. EINOLF: Dr. Fox's --

HEARING OFFICER FAY: All right.

MR. EINOLF: -- exhibit 3 of Dr. Fox's testimony, excuse me.

In that exhibit the South Coast Air Quality Management District for whom this was prepared, indicates that the numbers in the Arthur D. Little study are probably unduly high. It says, as stated above, probability, which is referred back to once in every 8.7 million miles, are considered unduly high. The probabilities of complete ammonia transport vessel failure are expected to be one-third less than those presented.

And that, if we were to apply similar logic to ours, and reduce those, that would be a failure rate of approximately one in 11.6 million miles, which would be a fairly substantial reduction.

MR. GALATI: With respect to any of the other exhibits, do you have any comments regarding any exhibits that were attached to her testimony?

MR. EINOLF: I don't believe so.

MR. GALATI: We can turn over to the panel for cross-examination at this point, but first I'd like to, if possible, move in the exhibits sponsored by Mr. Weiss earlier, and exhibit 40 sponsored by Mr. Einolf.

HEARING OFFICER FAY: Is there objection?

MS. HOLMES: No objection.

HEARING OFFICER FAY: Hearing none, so moved.

Does staff have any cross-examination of the panel?

MS. HOLMES: Staff does not have cross-examination of the panel.

HEARING OFFICER FAY: All right. Ms. Poole, does CURE have cross-examination?

MS. POOLE: Just a couple brief questions.

CROSS-EXAMINATION

BY MS. POOLE:

Q On page 4 of your testimony, this is for Mr. Einolf, you refer to three ammonia transporters that participate in the California Fertilizer Association Ammonia Transportation Safety Program.

Do you object to the condition of certification requiring Texaco to use only CFA certified carriers for the transportation of ammonia?

MR. EINOLF: That's not for me to make assertions on Sunrise's behalf, but --

MR. GALATI: If we could have a moment we could probably get the answer to that question.

PRESIDING MEMBER MOORE: Well, why don't we defer. I think we can get the answer to that. Do you need the answer right now? I mean that's --

MS. POOLE: I don't suppose I do.

PRESIDING MEMBER MOORE: What's your other questions?

MS. POOLE: Well, the other question you probably won't be able to answer either, but it is whether Texaco objects to using one of the three carriers relied on in your testimony.

MR. EINOLF: Again, I can't make business decisions on their behalf. That's certainly something that could be resolved here.

PRESIDING MEMBER MOORE: All right, well, maybe you can answer that one when you come back with the other question. Are those the end

of your questions?

MS. POOLE: Yes.

PRESIDING MEMBER MOORE: All right.

HEARING OFFICER FAY: Any questions from the Committee?

PRESIDING MEMBER MOORE: None from me. None from Dr. Rohy.

HEARING OFFICER FAY: I've just got a few.

EXAMINATION

BY HEARING OFFICER FAY:

Q Mr. Einolf, what was the basis for your assumption on page 6 of your testimony that one million tons of ammonia is shipped by road in California?

MR. EINOLF: The basis of my assumption was the calculations which I concur with in Dr. Fox's testimony. And that's based on data from the Fertilizer Institute relative to the amount of fertilizer and other ammonia products shipped. That number is consistent with numbers in previous studies increased for, which was about somewhere around 890,000 tons increased over the years from the date of those studies to now for the increase in production of ammonia and the relative

proportion of ammonia used in California.

HEARING OFFICER FAY: And Dr. Fox, in her testimony, on page 10, used risks and consequences of ammonia transportation accident. Do you disagree on both factors, both for the risk and the consequence, regarding the need for additional mitigation?

MR. EINOLF: When you say ammonia you mean the differences between shipping anhydrous and aqueous ammonia?

HEARING OFFICER FAY: Yes.

MR. EINOLF: I disagree in terms of overall risks. Again, my supposition, and I believe it's supported by the data, is that the risk in transportation is vehicle miles traveled. That is, the more vehicles you have on the road, the more likely you are to have an incident.

If you take a look at the table that's provided at the back of my testimony, you can see that most incidents have either only one or two minor or major injuries. And if you go back into the data and take a look at that, the roadway accidents generally affect either the driver of the hazardous materials vehicle or the driver of the car that hits him.

And potentially the first responders on the scene have -- of course, first responders have gotten more education since the passage of the HazWAPR rules and refinement of our emergency response system, but first responders are still affected.

Aqueous ammonia is just as dangerous as anhydrous ammonia in the 20 percent-plus solution to those in the immediate area in a transportation accident. And what I mean immediate area, I mean the driver of the other vehicle, and those people first on the scene.

PRESIDING MEMBER MOORE: Mr. Einolf, just so we're clear on this, what you're trying to do is you're trying to represent a concept of risk using the best parametric that you can, and in this case vehicle miles is a better representation of it, as opposed to the fact that if you get in a truck and you drive, there's a risk to that.

You're trying to quantify the risk and the best metric that you can come up with is the one of vehicle miles traveled, as opposed to the vehicle, itself, being unsafe, or the driver being unsafe.

So you're saying the better

representation of the risk is using the metric of vehicle miles traveled.

MR. EINOLF: Well, unsafe drivers are part of it. Obviously the longer a driver's behind the wheel, or the more drivers you have on the road, yes.

PRESIDING MEMBER MOORE: All right, thank you.

HEARING OFFICER FAY: And these are factors that go towards weighing the advantage of aqueous versus anhydrous ammonia in terms of transportation only, and that's what you're addressing now, is that correct?

MR. EINOLF: That's correct.'

HEARING OFFICER FAY: Not necessarily the on-site storage?

MR. EINOLF: I think we adequately discussed that prior to that. The supposition is only that because of the fact that you take -- you know, the reaction that's going on to provide air pollution control in this particular case is a reaction between one molecule of ammonia and -- I don't know the -- but however many molecules of NOx that we're dealing with in order to cause a reaction.

So, if we go from anhydrous, which is a virtually pure substance, to aqueous, which has water, we're going to have to -- if we're going to have a 20 percent solution on site, we would need five times more trips by a vehicle to fill that -- to continue to fill those tanks.

PRESIDING MEMBER MOORE: In other words, go back to my other question so we don't get this confused in the narrowness of the detail, what you've done is to increase the possibility. If there's going to be an accident anyway out there somewhere, you've increased the possibility by five times that an accident would happen because you've simply got five times as many vehicle miles being driven. Not that the truck driving anhydrous versus the truck driving an aqueous solution is more likely to be in an accident?

MR. EINOLF: That's correct.

PRESIDING MEMBER MOORE: Thank you.

HEARING OFFICER FAY: And referring to exhibit 7 of Dr. Fox's testimony, where she includes an overview from the California Fertilizer Association regarding standards for ammonia transportation safety, you distinguished the safety level, if you will, of industrial

deliveries versus agricultural deliveries.

Is it your impression that the industrial deliveries are at least up to the standards identified in this exhibit?

MR. EINOLF: Well, firstly, the industrial deliveries within my knowledge, and again I can't speak to the conditions of certification or other things, but within my knowledge the major ammonia industrial -- ammonia, within the State of California, is brought in primarily by three organizations, California Ammonia Company, CalAmCo, the former Unocal, which is now called Prodica, and by LaRoche in LaMirada.

And each of those -- the two previous use either Bulk or Button transportation. And/or a privately owned vehicle by one or the other of the agricultural ammonia providers. There are a number of them in the State of California, Western Farmers, J.R. Siplat and so forth.

They move that -- the ammonia, though, for industrial deliveries is moved by one of those two transportation companies. And those transportation companies adhere to standards which are above or beyond those that are required by CFA.

HEARING OFFICER FAY: Thank you.

MR. EINOLF: CFA Program, I should also indicate, was developed in 1989. Since 1989 two major changes to hazardous materials transportation requirements have been made, and a third known as HM-225, was just passed relative to loading and unloading events in 331 trucks, simply because there continue to be issues with the loading and unloading of vehicles in terms of attendance and so forth.

So the federal rules and the attendant state rules are continuing to get stricter and stricter.

HEARING OFFICER FAY: All right, thank you.

MS. POOLE: May I ask one recross?

HEARING OFFICER FAY: Yes, within the scope.

RECROSS-EXAMINATION

BY MS. POOLE:

Q You stated that you believe that the risk of accidents are primarily associated with the number of vehicle miles traveled. Given that, it would make sense to reduce the risk by restricting ammonia deliveries from someplace

nearby, such as Bakersfield, correct?

MR. EINOLF: Well, were there a supplier of anhydrous ammonia that was not increasing rail travel to those locations, I would say yes. If you take a look at the hazardous materials incident database and, heck, we just had a derailment yesterday, a major derailment yesterday.

The vast majority, ten to one over roadway transportation incidents are rail. I think anything that increases the amount of rail movement is probably imprudent.

The Unocal and CalAmCo shipments are by and large coming in by ship, which from a transportation statistics number, is far far safer. And I think the combination of ship -- my opinion is that the combination of ship and roadway transportation is far safer than rail transportation.

MS. POOLE: Does anhydrous ammonia only get to Bakersfield by rail?

MR. EINOLF: Rail or road, as far as I know, yes. There's very little other way that it can get. In the midwest there is some ammonia pipeline activity, but I don't think there's sea

access to Bakersfield, so, no.

HEARING OFFICER FAY: Anything further then? All right.

Thank you, Mr. Galati.

MR. GALATI: I have one --

HEARING OFFICER FAY: Oh, you do?

MR. GALATI: -- redirect on that point.

REDIRECT EXAMINATION

BY MR. GALATI:

Q With respect to the assertion that Bakersfield, deliveries from Bakersfield would be less probability, the probability that you calculated was from Stockton, correct?

MR. EINOLF: The probability that was calculated by the applicant in the AFC -- in the responses was from Stockton, yes.

MR. GALATI: Okay. All the other locations, LaMirada, and possibly Bakersfield, would be a lower probability than that, correct?

MR. EINOLF: Our rate of failure is based on the vessels, but if we were -- to take a look at vehicle miles traveled that would be a little lower probability.

MR. GALATI: So, the probability of 8.5 times ten to the minus 6?

MR. EINOLF: Is based on the vehicle, itself.

MR. GALATI: And that would be the worst case scenario?

MR. EINOLF: What we were looking at is a probability of the worst case scenario which is regardless of how the accident happens or whether it was even spontaneously a complete vessel failure. Again complete vessel failures, the only one that I know of happened in 1976 when a fully loaded tanker truck flipped off an overpass in Houston and fell 30 feet and broke in half.

I don't think the transportation route has that much altitude, so I don't think that's necessarily a case.

MR. GALATI: Thank you, I have no further questions.

HEARING OFFICER FAY: Any further recross on that matter?

MS. POOLE: Yes, one question.

FURTHER RECROSS-EXAMINATION

BY MS. POOLE:

Q So you just stated that your probability analysis is not based on vehicle miles traveled, it's based on the type of vehicle?

MR. EINOLF: The analysis in the applicant's package and in the responses is based on -- is a total failure I believe based on the Baldock numbers, based on a chance of a complete vessel rupture per year.

It includes vehicle miles traveled, yes, because it's using the USEPA's technical guidance for hazard analysis. And it uses the maximum distance number.

But the core of it is in terms of actually -- it's not using the strict -- we're not using the 8.7, one in 8.7 million miles traveled. We were calculating our own based on the number of tankers -- number of times that the ammonia would contact a tanker.

MS. POOLE: Thank you.

HEARING OFFICER FAY: All right. Nothing further, then, Mr. Galati, we thank you for your panel's testimony. And ask the staff if they're ready to move forward on transportation.

MS. HOLMES: Staff is ready to move forward. I do have a procedural question first. When we were scheduling these hearings the Committee asked that staff make available for Committee questions a staff witness who had

previously testified, Mr. Rick Tyler.

As you are probably aware, staff's traffic and transportation analysis is a qualitative analysis. The analyses that we've been discussing this morning that were prepared by CURE and by Sunrise are quantitative analyses, and they depend heavily on an understanding of the relationship between the risk of occurrence and the consequences of release.

Mr. Tyler addressed that relationship between risk and consequence in his hazardous materials testimony. And it was my understanding that the Committee wanted him available in case they had questions about that relationship with respect to the traffic and transportation testimony that's been provided.

I don't have any direct questions, but he is available if the Committee would like to ask questions about that topic.

HEARING OFFICER FAY: Thank you.

PRESIDING MEMBER MOORE: Have none at this time.

MS. HOLMES: Okay. Then staff's witness on traffic and transportation is Mr. David Flores.

HEARING OFFICER FAY: Before we swear

the witness, what I would ask, though, is that they be made available as a panel so that if questions do arise, we can ask either one.

MS. HOLMES: Okay.

HEARING OFFICER FAY: Please swear the witness.

Whereupon,

DAVID FLORES

was called as a witness herein and after first being duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. HOLMES:

Q Good morning, Mr. Flores. Did you prepare the traffic and transportation analysis that's contained in exhibit 32?

A Yes, I did.

Q And is there a statement of your qualifications in that exhibit?

A Yes, there is.

Q And are the facts contained in that -- do you have any corrections to any of the testimony you provided?

A Yes. Just a minor correction to page 19, under introduction, staff indicates

preliminary staff assessment, and it should just be corrected to final staff analysis.

Also, staff will be discussing condition Trans8 under the conditions of certification during my testimony.

Q Thank you. And with those corrections, are the facts contained in your testimony true and correct to the best of your knowledge?

A Yes, they are.

Q And do the opinions contained in this testimony represent your best professional judgment?

A Yes, they do.

MS. HOLMES: Before I ask Mr. Flores to provide a summary of his testimony, I'd like to make two requests. First is that the Committee take official notice of the regulations that are mentioned in staff's testimony on page 19 and 20 relating to transportation of hazardous materials.

HEARING OFFICER FAY: So noted.

MS. HOLMES: And secondly, it's my understanding that Mr. Flores will be referring to two documents in his summary, so we might as well have them marked as exhibits and distributed prior to his giving his summary.

The first document is entitled, Large Truck Traffic Safety Facts 1995, prepared by NTSA. Would the Committee like me to provide a copy at this time?

(Pause.)

MS. HOLMES: I believe that would be exhibit 41.

HEARING OFFICER FAY: That will be marked exhibit 41, Large Trucks Traffic Safety Facts 1995.

MS. HOLMES: Thank you. The second document is entitled, Hazardous Material Shipments prepared by the Office of Hazardous Material Safety, dated October 1998.

Is that exhibit 42?

HEARING OFFICER FAY: You'd like that marked for exhibit? Okay, exhibit 42 is Hazardous Materials Shipments October 1998.

MS. HOLMES: Thank you.

Mr. Flores, would you please prepare or give us a brief discussion of the scope and the conclusions in your testimony?

MR. FLORES: Yes. Staff's analysis was based on the documents that were provided to the Commission. Essentially the testimonies and also

the AFC that have been recently provided as part of the documentation.

Staff did review the various documents and determine that they were accurate in their findings. Staff also provided additional regulations that pertains to the LORS, as indicated on page 19, 20 and 21 of the staff analysis, which addressed both state and federal and local agency requirements, and also the regulations.

Staff also reviewed the analysis provided in the AFC regarding transportation issues in the areas of both construction impacts and also at the time that the project is completed as to the number of vehicle traffics and also traffic that will occur during these timeframes.

Staff also reviewed and discussed with the various agencies, specifically Kern County and also the California Highway Patrol, as to the accident levels that have occurred both on the county roadway systems and also the state highway systems.

As provided in the report specifically under table 1, and also table 2, the level of service which is level of service A will continue

both during construction periods and also during the operational phase of the project.

Staff concurs with the testimony that was previously discussed as to certain intersections. And those were discussed with also the California Highway Patrol in establishing condition number both 7 and 8, Trans7 and 8 which discuss utilizing a flagman or sheriff during times of construction.

Also, as part of my testimony, in reviewing the testimony provided by Phyllis Fox, the documents that were put into evidence which was the large truck traffic safety facts provided just recently to you. On page 3 of 5 staff would like to read an excerpt from this document which provides staff's assessment as to why we looked at just the local roadway systems in our analysis, rather than looking at the interstates.

And I'll read very quickly, in half of the two vehicle fatal crashes involving a large truck and another vehicle, both vehicles were proceeding straight line at the time of the crash. In 10 percent of the crashes the other vehicle was turning a 9 percent, either the truck of the other vehicle was negotiating a curve. In 8 percent

either the truck or the other vehicle was stopped or parked in the traffic lanes, 6 percent and 2 percent respectively.

Most of the fatal crashes involving large trucks occurred in rural areas, 63 percent during the day time, 66 percent -- excuse me, in rural areas 63 percent. During the daytime 66 percent and on weekdays 80 percent. During the week 70 percent of the crashes occurred during the daytime, 6:00 a.m. to 5:59 p.m. And on weekends 65 percent occurred at night, which is 6:00 p.m. to 5:59 a.m.

Also under the hazardous materials shipments document that's provided by the Office of Hazard Material Safety, research and special programs administration, which is dated October of '98, on page 8 of this document they also indicate that construction of infrastructures affect risk.

Two-lane rural roads typically have much higher accident rates than divided multi-line interstate highways. Additionally, interstate highway segments with narrow shoulders and damaged pavement are generally more risky than interstate segments without these problems.

So, with these factual documents

provided, staff concurs with the testimony provided by the applicant, that, in fact, rural roads will have more potential as a higher risk for accidents. And that's why staff, in their analysis, provided data based upon observation of the roadway systems to determine whether or not the roadways were, in fact, adequate, providing sufficient shoulders matching the pavement along these rural roads.

Staff also looked at the issue of direct impacts both on the temporary effects and the permanent effects, and also the indirect effects involved with this project, and determined that based upon the information that has been provided, and also the information that staff has obtained through various agencies, that both the roadway systems will be adequate and will be able to handle the additional traffic that will occur along these roadway systems.

On page 37 of staff's report staff has indicated that compliance with laws, ordinances, regulations and standards both for the federal, state and local agencies. Staff also discusses facility closure. Also on page 38 staff provides both conclusions and recommendations of their

analysis.

The conditions of certification are listed on page 39, and are indicated as both Trans1 through Trans8. As indicated, in the applicant's testimony, staff has concurred to a minor change to conditions of certification Trans8, which is as follows:]

Prior to the commercial operation the project owner shall negotiate an agreement with Caltrans for the payment of a fair share amount for the future signalization at the intersection of State 119 and Midway Road. So the word construction has been eliminated.

Under verification, the fair share amount shall be paid to Caltrans at least 30 days prior to the start of, and project construction again is crossed out, and commercial operation has been -- the rest verification condition remains.

This completes staff analysis. If there's any questions at this time --

MS. HOLMES: Thank you. Mr. Flores is available -- and Mr. Tyler are available for questions on traffic and transportation.

HEARING OFFICER FAY: Did you wish to introduce the exhibits into evidence, or merely

have them marked for identification?

MS. HOLMES: That's an excellent idea. At this point I'd like to move that exhibits 41 and 42, as well as the traffic and transportation portions of staff's testimony be moved into evidence.

HEARING OFFICER FAY: Any objection?

MR. GALATI: No objection.

HEARING OFFICER FAY: All right, so moved.

Mr. Flores is available for cross-examination. Mr. Grattan.

MR. GALATI: No cross-examination.

HEARING OFFICER FAY: Or Mr. Galati. Ms. Poole?

MS. POOLE: No questions.

PRESIDING MEMBER MOORE: None.

HEARING OFFICER FAY: Just a few questions.

EXAMINATION

BY HEARING OFFICER FAY:

Q Mr. Flores, could you explain the reason for the timing change in condition 8, Trans8?

MR. FLORES: Originally the information that was provided by Caltrans indicated an actual

fee that was to be paid as part of the intersection improvements, i.e., signalization at that intersection.

At this point staff felt it was important that the applicant discuss this with Caltrans as to the amount that will actually be paid to Caltrans for this future development.

And so from the point of staff, we felt that this could be negotiated and discussed, and it could be agreed upon, you know, prior to the actual commercial operation of the project.

HEARING OFFICER FAY: All right, thank you. And you've examined the roads at least between the interstate and the project site in terms of the adequacy to deliver hazardous materials such as ammonia?

MR. FLORES: Yes, I did.

HEARING OFFICER FAY: And found them adequate?

MR. FLORES: Yes, they have sufficient shoulders, and the pavement is in good condition.

HEARING OFFICER FAY: Do you believe there's any risk of significant impact from the project's transportation of ammonia?

MR. FLORES: No, I do not. I believe

that in reviewing the various roadways that could be taken, that the roadways are adequate and can be safely driven in carrying hazardous materials.

HEARING OFFICER FAY: Okay. And, Mr. Tyler, have you reviewed the supplemental testimony of Mr. Einolf?

MR. TYLER: Yes, I have.

HEARING OFFICER FAY: Regarding the risks involved of the ammonia transportation?

MR. TYLER: Yes. And I also reviewed Ms. Fox's testimony, as well.

HEARING OFFICER FAY: All right. And, did you have any problem with Mr. Einolf's assertion of -- general assertions of conservatism in the analysis that was used?

MR. TYLER: No. I would generally agree with his assessment.

HEARING OFFICER FAY: All right. Do you think that the mitigation measures proposed by staff in this area are adequate to address the risks that are involved?

MR. TYLER: Yes, those in conjunction with the applicable laws that apply to the transportation of anhydrous ammonia, both transportation and training of drivers. And in

light of that, as well as the accident record, I would agree that the risks are very very low. And that's insignificant.

HEARING OFFICER FAY: All right. Thank you.

Anything further, Ms. Holmes?

MS. HOLMES: I have nothing further.

HEARING OFFICER FAY: All right. Ms. Poole, would you like to present your witness?

MS. POOLE: Yes, please. I'd like to call --

HEARING OFFICER FAY: Yes, they are excused, the staff witnesses are excused.

MS. POOLE: I'd like to call Dr. Phyllis Fox to the stand. And the witness does need to be sworn.

Whereupon,

J. PHYLLIS FOX

was called as a witness herein and after first being duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. POOLE:

Q Would you please state your name and qualifications for the record?

A Phyllis Fox. I have --

PRESIDING MEMBER MOORE: Counsel, excuse me -- counsel, can you just give her the microphone that's in front of you? Thank you.

MS. POOLE: Oh, this one doesn't work?

PRESIDING MEMBER MOORE: That's recording only.

THE WITNESS: Phyllis Fox, I have a bachelors degree in physics and a masters and PhD in environmental engineering from UC Berkeley. And I have 28 years of experience working in the environmental field in a range of areas. I do water, air, hazardous materials, consequence analysis and hazardous waste.

In the case of the testimony I'm giving here, I have done approximately 20 transportation risk analyses involving ammonia. And I have done well over 100 consequence analyses involving not only ammonia, but numerous other hazardous materials like chlorine, for example.

BY MS. POOLE:

Q Was this testimony, which has not been marked as an exhibit yet, and perhaps should be, prepared by you or under your direction?

A It was.

MS. POOLE: Hearing Officer Fay, would you like to mark this?

HEARING OFFICER FAY: Yes, let's mark Dr. Fox's testimony, the entire packet, testimony of J. Phyllis Fox, on behalf of CURE, traffic and transportation impacts and worker safety impacts filed on October 26, 1999, as exhibit 43.

MS. POOLE: Thank you.

BY MS. POOLE:

Q Do you have any changes that you'd like to make in this testimony?

A I do, I have one. In my original testimony, exhibit 2 is a report by the Santa Barbara County regarding ammonia transportation for an FCR system at the Chevron Gaviota facility.

And after I submitted my testimony I discovered that based on public comments on that document that Santa Barbara had modified their analysis and actually expanded it.

The copy of exhibit 2 in my testimony evaluates transportation rails from the south coast and from Bakersfield. And in the 1992 revision, which we're going to submit as an exhibit, they expanded that analysis to include additionally transportation from the Stockton

area. So that analysis is actually very similar to what we're facing here, transporting anhydrous ammonia for a selective catalytic reduction system considering two suppliers, one in the Los Angeles Basin, and the other one in the Stockton area.

MS. POOLE: I do have copies of that which I can pass out at this time.

MR. GALATI: I would object at this time that this is supplemental testimony without giving the applicant an opportunity to take a look at it. It's not direct rebuttal. They have had opportunities to file testimony, as did we, so that everybody could see and be able to comment and present a witness.

I'm completely finished with my witnesses at this point, but have not had an opportunity to comment on that analysis. So, I'd object to it being both added to her testimony or being referred to in her testimony.

MS. POOLE: Well, this is a supportive document that, as Dr. Fox explained, is simply a revision of something we had previously submitted. It's very similar to what staff has just submitted. And I think that it should go into the record.

HEARING OFFICER FAY: Well, let's distribute it and mark it for identification. And hold the ruling on your objection until we've had a chance to discuss it further.

(Pause.)

HEARING OFFICER FAY: That will be marked for identification as exhibit 44, and it's an Arthur D. Little Final Risk Assessment for Ammonia Transportation to the Chevron Gaviota Facility.

MS. POOLE: Thank you.

BY MS. POOLE:

Q Would you please summarize your testimony?

A Sure. I did a ammonia transportation risk analysis from scratch because of the inadequacies in the applicant's and staff's analysis.

In my analysis I assumed a modest size release of 1000 pounds of anhydrous ammonia. That's about 265 gallons. In contrast, Mr. Einolf analyzed a release of 7500 gallons, which is quite a large release, and I actually agree with both him and staff that the probability of such a large release is improbable.

Most of the releases of anhydrous ammonia that occur are actually quite smaller. So, in my work I picked a smaller, more reasonable release of 1000 pounds.

I modeled the distance an ammonia cloud would travel from a truck accident using a AMOHO, which is a standard model, and that analysis showed that the ammonia cloud would travel up to two miles from the accident site where the concentration would be 75 ppm, and that level is staff's level of significance for exposure to ammonia that they routinely use in their analyses.

I then did a probability analysis of the occurrence of that accident. And I didn't rely on the same probability data that the applicant did. The data that the applicant relied on is actually from the early '60s. And as you all know a lot has changed since the early '60s.

There's a whole lot more traffic today than there was in the early '60s. And the amount of traffic on a road depends, in large measure, on whether or not you're going to have an accident.

Another problem with the data that the applicant relied on is they don't tell you what kind of trucks were involved, or how large the

release was. So I rejected the data that the applicant used, and I used more recent data. I used data from the National Response Center, which it turns out is essentially identical to the data from the HMIS database system which Mr. Einolf talked about.

And from that data I selected only accidents involving tanker trucks, the type of tanker trucks they use to carry both industrial and agricultural ammonia. And I counted up the number of releases of 1000 pounds or more. I adjusted it by a factor of two to account for a well documented under-reporting in the database, and I calculated the probability, which I then used together with information on the suppliers, the distance of the suppliers from the site, to calculate a probability of an accident for supplying ammonia to the site.

And the number that I came up with was .3 percent. And .3 percent is generally considered to be significant by most agencies that evaluate this kind of information.

Q Does that conclude your summary?

A That's it.

Q I'd like to ask you some questions about

Mr. Einolf's testimony. On page 2 of his testimony he states that Texaco used the, quote, "only available data for ammonia carrier incidents", unquote, in developing its probability analysis.

Do you agree with this statement?

A No. Actually Texaco used, as I said, the Baldock study. The Baldock study is a published journal article dated 1980 and it was based on 12 years of data from the '60s.

And it doesn't document at all where the information came from. In those days there wasn't really any in-place database for reporting of ammonia statistics. It was pretty much an anecdotal telephone survey.

It's a very poor piece of work in my opinion. And there are other more recent sources of ammonia incident data. One of them is the HMIS database that Mr. Einolf talked about, a part of which is the National Response Center database which I relied on.

Q On that same page, page 2 of his testimony, Mr. Einolf states that quote, "the reference from Baldock is the only one that provides specific information on complete vessel

ruptures resulting in accidental releases" unquote.

Do you agree with that statement?

A No. That study does not deal with complete vessel ruptures. I have it here and I can show it to you. It's actually an exhibit in my testimony.

But if you take a look at it you will find that they don't state that the so-called major release is from a complete vessel rupture. They're silent on the size of the release, and that's one of the main problems that I have with that data. Except for the fact that it's based on very very dated information, and anecdotal information at that.

Q On page 3 of his testimony Mr. Einolf states that a release of 7500 gallons of ammonia in ten minutes has not occurred in the 20 years since inception of the HMIS reporting system.

Is this an accurate statement?

A It can't be supported with the information that he presented in his testimony. His testimony only presents information for 1993 forward. And I'm not aware of any ammonia-specific reporting database that goes back 20

years that would allow one to document that statement.

Q Both Mr. Einolf and staff have stated that highway transportation has a lower overall frequency of accident occurrence than rural routes. Do you agree with that?

A No, I don't. I think I gave some information in my testimony, but it's basically based on guidelines for chemical transportation and risk analysis.

This is an American Institute of Chemical Engineers' bible, basically, for doing transportation risk analysis. And in there there's a table that's table 2-7 on page 80. I know Mr. Einolf has it with him, because I saw it tucked under his arm, this is our bible.

In there it gives accident rates and release probabilities for both rural and urban roadways of various types. And if you multiply the accident rate times the release probability, what you find is that the probability of a release from a transportation accident is much higher on highways and urban areas than they are in rural areas.

Q Thank you. Mr. Einolf also discussed

the differences between delivery of anhydrous ammonia for agricultural purposes and deliveries of industrial ammonia.

Did you account for these differences in your analysis?

A Yes, I sure did. I think some explanation needs to be presented on the agricultural delivery issue. Almost all anhydrous ammonia, nearly 90 percent, is used for agricultural purposes.

And the way that it typically works, particularly in the midwest where a lot of the accidents have occurred, because that's where most of the use is, is the ammonia is brought in by standard MC331 tanker trucks from a port or a major distribution center to a major storage tank.

And then the local farmers who actually apply the ammonia drive up to this tank with what's called a nurse truck. And the nurse truck can be as simple as a pickup with a tank in the back. And they fill their tank up, and then they take it out in their field and they apply it.

It's that step from the main storage tank to the field where a lot of accidents occur and there aren't any, you know, regulations that

govern it.

I eliminated all of that from the data I used. The data I used is only for the tanker trucks.

Another interesting point on that is in California it's not the industrial users who have made an effort to eliminate the accidents from ammonia transport, it's the farmers. The California Fertilizer Association, in 1989, as Mr. Einolf admitted, put into place a very aggressive safety training program for carriers of agricultural ammonia.

So the claim that industrial transport is much safer than agricultural is simply not true. You have to look at the details of it. If you're talking about the nurse truck portion of it, yeah, it's true. But if you're talking about the transport from say the Port of Stockton to a main storage tank somewhere in the Central Valley, no, that's not right.

Q And I believe Mr. Einolf also stated that he thought that railroad transportation was less safe than truck transportation. Do you agree with that?

A I think he said the probability of

accidents was higher with rails than --

Q That's probably right.

A -- with trucks, or at least that's what I heard. And that's not correct, either. Rail transport is either as safe or safer than truck transport. That is also documented by the bible, which I have here. See if I can find it.

(Pause.)

BY MS. POOLE:

Q Perhaps we should move on. You can provide that reference, if you can find, it later on.

A I mean I wasn't prepared for that question, but it's documented in this book and we can come back to it.

Q Okay. One last question. The applicant relies on the HMIS data to make several conclusions, including a statement that major anhydrous ammonia accidents are uncommon, result in few injuries or deaths, and that there have been no anhydrous ammonia accidents in the past three years in California, none with injuries.

Do you agree that the HMIS data supports these conclusions?

A No, I don't. Back to the bible, the

HMIS database, like all of these ammonia transportation databases, is very incomplete, and the reporting is very incomplete.

And there's a section in the AICHE guidelines that I keep referring to that discusses that problem, and I'd like to read into the record from that book. I'm on page 114.

Several studies by the Office of Technology Assessment, which is an arm of the U.S. Government, and by Quantalytics, Inc., and by Midwest Research Institute, have raised concerns about the under-reporting biases of the HMIS database, and of other databases, as well.

I'd like to point out that the HMIS database is the basis of exhibit 1 from Mr. Einolf's revised testimony.

The database biases of the HMIS database and of other databases, as well, the database is assembled by HMIS from voluntary reports of truck incidents by the interstate motor carrier firms. Intrastate carriers are exempt from reporting.

Most of the ammonia use in California is intrastate, so you can't draw any conclusions from ammonia hazards in California from this database.

In the midwest, however, where most of

the ammonia comes, say, from Texas and is shipped intrastate all over the midwest or the farm country, you have interstate carriers, and that's where most of the ammonia accident reports actually come from. That database only covers interstate.

Let me go on, there's a bunch of bulletted items here. Estimates by OTA, that's the Office of Technology Assessment, suggest that the under-reporting is substantial. A DOT, Department of Transportation source estimated that 20 percent of all accidents are reported. In other words, 80 percent go unreported.

That's why in the work that I did I took the 13 incidences that I found and I doubled it. My doubling is actually conservative. I could have justified increasing it by 80 percent.

A comparison of HMIS data in a hazardous spill database developed by the Bureau of Motor Carrier Safety of the Federal Highway Administration indicate that about one-half of the spill accidents in each database is missing from the other database.

So, what we have here is a situation where the ammonia accidents, such as they are, are

substantially under-reported. And I think the estimate that I made is quite conservative, given the under-reporting problem that we're facing.

MS. POOLE: Thank you.

Dr. Fox is available for cross.

PRESIDING MEMBER MOORE: Could I have a couple of questions to start off with.

EXAMINATION

BY PRESIDING MEMBER MOORE:

Q Dr. Fox, you indicated at the beginning of your testimony and just now that you felt justified in doubling the rate of incidents. And I'd like to go to that for just a second.

When you refer to the doubling and you suggest that there have been at least, by your estimate, that many or that rate of accidents, do those accidents include personal injury? Or are they simply a spill that constitutes an accident?

A I did not investigate the personal injury question.

Q So we can't take any of that to be attached to a question of human risk, but more just confine itself to the question of whether or not there's a spill or an accident?

A That's right, you can't draw any

conclusions about human risk. I'd have to go back in and look at, you know, the injuries and --

Q Do you think, given your professional background, that there's any correlation between under-reporting -- I'm sorry, let me go back the other way -- between those accidents that are reported and those that are likely to have involved some injury of some type?

In other words that the correlation might be higher for things that are unreported to have been a leak which went away, affected no one, and as a consequence someone felt like, okay, I just won't report this?

I'm trying to understand why there would be such a risk of under-reporting. What's the motivation? I mean this is a serious chemical. It seems to me if there's a spill of almost any kind someone would be, unless they were a single driver unobserved on a rural road somewhere, there'd be a higher motivation to report it somehow, or to get the authorities involved.

Why are these being under-reported?

A I don't really know the answer to that. I would imagine that the reporting would occur locally, and that the requirement, which is not

enforced, to report to a federal database would probably just be overlooked in most cases, particularly given, you know, the hysteria that would surround that kind of an event.

Probably if we contacted the highway patrol of every major city in the country you might be able to compile more reasonable accident statistics, because it would usually be the local responder that you would call in and that you would report to.

I mean if there's not any penalty, I mean why report. A lot of it is voluntary. And furthermore, on the intrastate carriers, the within-state carriers, there's no reporting requirement at all. In a big state like California, that's what most of them are.

Q So in your opinion there isn't any correlation then between any of the under -- or there probably isn't any correlation between under-reported accidents and anything involving human injury? Or at least not that you know of?

A Not that I know of, no. I haven't personally looked at that question.

PRESIDING MEMBER MOORE: Thank you.

HEARING OFFICER FAY: Staff questions?

MS. HOLMES: Yes, we do have some questions, thank you.

CROSS-EXAMINATION

BY MS. HOLMES:

Q Let's start off with the same topic, about under-reporting.

In California you mentioned that the Highway Patrol would be likely to have more accurate data. Did you check with the Highway Patrol in California to find out what the accident rate was?

A No, I didn't.

Q Is it your belief that in California there's a significant number of accidents in which more than 1000 pounds is released that go unreported?

A I don't know.

Q Sunrise, as we discussed earlier, has indicated that they intend to use one of several carriers and I believe CURE has asked them to consider a condition of certification to make that mandatory. Are you familiar with that discussion that happened earlier this morning?

A Yes.

Q Do you believe that those carriers are

likely not to report incidents that result in the release of 1000 pounds of ammonia or more?

A Probably unlikely, assuming they are certified drivers through the California Fertilizer Association.

Q I'd like to go back to an earlier discussion about that portion of your analysis that discusses the consequence. That's on page 8 of your testimony. Do you have that in front of you?

A I do.

Q In that analysis you talk about some of the assumptions that you used, and one of them was F-stability class, do you recollect that discussion?

A Yes.

Q And wind speeds of 1.5 meters per second?

A Yes.

Q Would you agree that these are conservative assumptions?

A Yes, they are.

Q Do you know what the percentage of time is that those conditions actually occur?

A F-stability class typically occurs 20

percent of the time in California. The percentage of the time when wind speeds are less than or equal to 1.5 meters per second, I don't know off the top of my head, and it would vary depending on the site. You'd have to look at it.

But, it's important to realize that the probability of a wind speed is really not an issue here because it has a very minor effect on the outcome.

If you were to, for example, repeat this analysis using more common meteorological conditions, say D and four meters per second, it wouldn't change the conclusions at all.

And I'd like to just demonstrate that. If you look at exhibit 2 in my testimony, which is the Santa Barbara/Gaviota study, they did an interesting analysis in here. It's table 1, which is on page 7.

They did a consequence analysis for a number of different release scenarios for two sets of meteorological conditions, D stability and wind speeds of 4 meters per second, which is a really common condition in coastal California; and they did F stability and 2 meters per second. And it doesn't change any of the conclusions.

The vertical distance away from the accident site --

PRESIDING MEMBER MOORE: Horizontal distance.

DR. FOX: Horizontal distance away from the accident site -- thank you -- decreases, but the cross-wind area stays exactly the same. And in no case do you get an insignificant impact.

BY MS. HOLMES:

Q Looking at the column under 1000 ppm downwind, --

A Um-hum.

Q -- the number 32,000 under F2, --

A Right.

Q -- isn't that a significant reduction in the area of impact?

A It goes from a vertical distance of 32,000 feet out to 11,000 feet out, but whether it's 11,000 feet or 32,000 feet, if you're in an urban area like in the south coast, you've encompassed people and you've had an effect.

The width of that, the cross-wind is the same in both cases. So, yeah, it's a reduction in the area, but it's still a significant impact because you're still affecting people.

Q So you're assuming then that this is occurring in a heavily populated urban area, not along, for example, I-5 between -- I don't even -- unpopulated areas?

A Right, if it occurred in an unpopulated area, both of those would probably have no effect because there's nobody there. But, you know, the Stockton and the LaMirada routes that we're considering here, both originate in highly populated areas, and a significant fraction of route is through highly populated areas.

Q Let's move to that topic. The routes that you analyzed in your testimony, what percentage of the mileage is what you would call densely populated?

A I didn't calculate that. I'd just have to make a guess.

Q Wouldn't that affect the actual likelihood that people would be exposed in the event of an ammonia release?

A No.

Q In other words, don't there have to be people present to be affected?

A There has to be people present, yes, clearly.

Q And the more the route is through a rural unpopulated area, assuming an equal risk of an accident, the less probability that people will be affected if the routes are more rural in nature than if they are not?

A Right, you would affect fewer people in rural areas, for sure. But I don't think there's any portion of the route which is really unpopulated. The exhibit that's in contention actually has a table in it, actually it's one of the appendices, which goes through mile-by-mile from Stockton to the Bakersfield area laying out what the land use is --

MR. GALATI: And, again, I would object to this testimony.

PRESIDING MEMBER MOORE: Let me just follow up on Ms. Holmes' question and I think maybe it will get to where counsel's going. At least I hope so.

I need to back up just a second to Caryn's previous question. Just so that I understand, Dr. Fox, in your earlier testimony you indicated that you considered it extremely unlikely that the kind of release that the applicant was talking about in that volume would

occur. In fact, saying that the more likely release, if there was one, was going to be under 1000 gallons?

DR. FOX: A thousand pounds, right.

PRESIDING MEMBER MOORE: Thousand pounds, I'm sorry. And if I look at the table that you referred to in the originally submitted testimony, which is table 1, ammonia toxic dispersion hazard zones, it looks to me as though the more likely correspondent number to what you're talking about is the 100 gallons per minute over ten-minute period. Am I right? That's the second number down.

DR. FOX: Well, 100 gallons a minute in a ten-minute period, that's 1000 -- yeah.

PRESIDING MEMBER MOORE: And as a consequence, the numbers that you were talking about, the 11,000 and the 32,000, in terms of feet, the radial dispersion, are not the numbers that you're talking about. You're talking about numbers that are 1600 and 4500 feet, if they correspond with the metric that you use.

I just want to make sure that I'm understanding the table right, so I'm using your data, or the data that you're quoting, and I want

to make sure that I'm on the right track. You, minutes ago, talked about 11,000 and 32,000 feet, when in fact the metric that fits the more likely scenario that you're talking about is the 1600 to 4500 feet?

DR. FOX: Yeah, you're right. I was just picking the first two lines on the table as an example. I wasn't --

PRESIDING MEMBER MOORE: Understand, but I'm trying to understand what the highest correlation here is. We're talking statistics, at least a language that I'm a little bit familiar with, and so I want to make sure that I'm using the right terms.

DR. FOX: Right, --

PRESIDING MEMBER MOORE: So I've got the radius right?

DR. FOX: You've got the radius right. It is --

PRESIDING MEMBER MOORE: And it shrunk up by about three times?

DR. FOX: It would be more like the second one. But there's another important difference between this and my analysis, and that is the column that we're talking about, this 1000

ppm column?

PRESIDING MEMBER MOORE: Um-hum.

DR. FOX: That was I was using 75 ppm in my analysis, so the distances in my analysis are larger than this. The smaller the concentration the greater the distance.

PRESIDING MEMBER MOORE: The smaller the concentration over the -- all right, I'll take your word for it. I would have assumed that that was a constant, or relatively constant dispersion pattern that they were trying to approximate that dispersion concentration over that entire distance. Am I wrong?

DR. FOX: If they had have extended this table and had a column for 75 ppm out here --

PRESIDING MEMBER MOORE: Right.

DR. FOX: -- the numbers, instead of being 1600 and 4500 would have been substantially higher. I don't know how much higher because they used a different model and --

PRESIDING MEMBER MOORE: I see, all right.

DR. FOX: -- different assumptions than I did.

PRESIDING MEMBER MOORE: I can graph

that in my mind. All right, thank you. I'm sorry to have interrupted, Ms. Holmes.

Now, can I go back to the objection, counselor?

MR. GALATI: Yes, just to renew the objection that she's referring to a supplemental testimony, an exhibit that she said she just came across this is dated May 23, 1991.

PRESIDING MEMBER MOORE: All right, now, the table I just talked from was from the original testimony. Dr. Fox, are you in fact, right this instant, referring to the study which you passed out which we accepted, but not as evidence yet?

MS. HOLMES: I was asking from the original. It wasn't withdrawn --

DR. FOX: No, I'm talking about exhibit 2 in my testimony.

PRESIDING MEMBER MOORE: All right, well, counselor, I'm going to overrule that, and simply say that I'm going to take her reference as to the original report which we have and which we, in fact, have accepted.

MR. GALATI: If I just may clarify, there was a portion of her testimony in which she was alluding that there was a segment-by-segment

analysis from Stockton down to this area. That testimony is referring to this new document, and that's what I'm objecting to. Not to the use of table 1.

HEARING OFFICER FAY: Understood.

PRESIDING MEMBER MOORE: Understood. And that ought to be removed then, because we have not accepted that. So, Dr. Fox, if you could contain your responses to what we have accepted on the record.

DR. FOX: Surely.

PRESIDING MEMBER MOORE: Thank you.

Ms. Holmes, I'm sorry I interrupted you. It's back to you.

MS. HOLMES: Thank you, Commissioner Moore.

BY MS. HOLMES:

Q I'd like to keep looking at table 1. Isn't it true, Ms. Fox -- Dr. Fox, excuse me, that in the 1000 gallon per minute ten-minute scenario there's a significant difference in the cross-wind area of effect?

A Yes, in the case of that one, there is.

Q Thank you. Now, I'd like to turn to some questions about the probability analysis,

which in your testimony begins on page 8.

And you reference the National Response Center database number of 13 accidents. Do you recollect that discussion?

A Yes.

Q Now, I understand that you have testified that you believe it's appropriate to double the number, or perhaps even make it higher, more than 100 percent higher. But let's walk through a hypothetical where we use the 13 accidents.

If you have 13 accidents over nine years, that's what, roughly 1.4, 1.5 accidents per year, is that approximately correct?

A Yes.

Q And you said that there were 98 of the 2000 tanks that you estimated were located in California, is that correct?

A Correct.

Q So that's a little bit less than 5 percent of the tankers are in California?

A Correct.

Q Would it be appropriate to apply the same percentage to the same number of accidents? In other words, if 98 of the tankers are, or 4.5

percent of the tankers are in California, couldn't you also say that 4.5 percent of the accidents occur in California?

A Yes.

Q And I won't make anyone go through the math since I think we can all calculate it ourselves, but that would yield a California accident per truck per year rate of roughly .00067, which I think would be similar if you had taken the 13 numbers and applied the Baldock procedure to it, I think you end up with something quite similar, I think it's 0.0007, is that consistent with your recollection?

A I think so, yes.

Q Now, in terms of the discussion about the number of hours traveled on the bottom of page 9, you indicated that approximately 7 percent of the time a tanker would be associated with ammonia transport for the Sunrise project, is that correct?

A Yes.

Q That's over a given year?

A This is the 149 over 2102 at the bottom?

Q That's correct.

A Yes.

Q Does that 2100 in two hours include the entire time that the truck is on the road?

A The 2102 doesn't have anything to do with number of hours on the road. The 149 is the number of hours on the road, and that's actually the applicant's number.

Q What's the 2102?

A The 2102 -- let me see -- I think that's also the applicant's number, actually.

Q It's my understanding from reading the equation it would be the total number of hours that the tanker is on the road, that's how you get the percentage that you referred to?

A No, the 149 is the number of hours that the tanker is on the road.

Q Devoted to the Sunrise project?

A Devoted to the Sunrise project.

Q Out of the total number of hours that it's on the road each year?

A Oh, the 2102, okay, that again is the applicant's number. I guess so.

Q Isn't it true that about half of the time that the tanker's on the road it's going to be empty because it's already delivered its load of ammonia?

A I don't know about half, but some fraction of the time that it's on the road it would be empty, because it would be going to pick up another load.

Q And wouldn't that reduce the risk by that amount?

A I think the 149 hours is the time it's carrying, and I think that was taken into account.

Q But you don't know that?

A I seem to -- when I worked on this, and it's been awhile, I think that's how the Texaco people made the calculation. The time when the tanker was empty is considered already.

Q I'm looking back at your testimony on page 7 where you talk about the 2102 hours per year, and I'm not seeing any qualifications that those number of hours only represent times when the tank has ammonia in it.

It appears from the way it's written the total number of hours that the truck is in use.

A Give me a second to read it.

Q Okay.

(Pause.)

DR. FOX: Okay, try your questions again.

BY MS. HOLMES:

Q Let's see if I can ask it in a more understandable way. When ammonia deliveries are made the tank truck is empty on the return trip, isn't that correct?

A That's correct.

Q So, of those total number of hours that the tanker truck is in use, at least some portion of that, probably approaching 50 percent, the truck is empty?

A Yes.

Q And there is no risk of release when the truck is empty?

A That's correct.

Q Thank you. Did you look at the National Response Center database information?

A Yes.

Q And you looked at the 13 accidents that were reported?

A Yes.

Q Were any of those in California?

A No.

Q I'd like to turn for a moment to your proposed conditions of certification. The first one being requiring the use of aqueous ammonia.

Did you do a comparative risk analysis of the transportations associated with anhydrous versus aqueous ammonia?

A Not for this case, no. But I have done that in the past.

Q Do you agree generally with the statement by Mr. Einolf earlier this morning that the use of aqueous ammonia would require more trips?

A Yeah, that's true. The use of aqueous ammonia would require more trips, and I have no problem with this statement that it would be five times more trips. However, the important thing is that anhydrous ammonia is transported under pressure, and it's essentially 100 percent ammonia. So when you have an accident the consequences are substantially greater.

Aqueous ammonia, on the other hand, is transported under ambient conditions, and it's typically a 19 to 30 percent solution. So when you have an accident the consequences are substantially lower.

So, yeah, it's true the probability of release is larger for an aqueous ammonia accident, but the consequences are substantially smaller.

And that's why most regulatory agencies promote the use of aqueous ammonia over anhydrous.

Q Isn't it true that the relative effect of an aqueous ammonia release versus an anhydrous ammonia release would depend on where it occurs?

A Yes.

Q And the number of people that are in the vicinity of the release?

A Yes.

Q Do you knwo whether or not there are federal regulations for the transportation of anhydrous ammonia?

A Yes, there are.

Q And for aqueous ammonia?

A I think it depends on the percent ammonia in it. Yes.

Q Would you consider the regulations for anhydrous ammonia to be strict?

A Yes.

Q Are there specific vehicle requirements?

A Yes.

Q Are there licensing requirements --

A Yes.

Q -- for the companies that transport the material?

A There are.

Q Earlier you mentioned the fact that there are, in fact, so few regulations regarding -- or requirements regarding the transport of aqueous ammonia that you could put it in a fiberglass tank for example, on the back of a pickup truck, is that correct?

A No. I was talking about anhydrous ammonia there. Anhydrous ammonia is what's primarily used in farm country, and it was the so-called nurse tank that I was referring to for anhydrous ammonia.

Q But isn't it true that in California you can transport anhydrous ammonia -- excuse me, aqueous ammonia in a fiberglass tank on the back of a pickup truck?

A I'm not certain about that, I don't know.

Q If you were to assume, for purposes of a hypothetical question that that were true, isn't it also true that a release is going to be far more likely if aqueous ammonia is transported that way, than if anhydrous ammonia is transported per the federal regulations?

A Yeah, and I think it depends on the

percent ammonia in the solution as to which regulations govern it. And I think if it's above 19 percent it's covered by pretty much the same, or very similar regulations.

And I don't think anybody supplying industrial ammonia would carry it in a fiberglass tank. And, in fact, if you look in the National Response Center database you'll find that there have been far fewer, far fewer, we're talking orders of magnitude, far fewer accidents involving aqueous ammonia than anhydrous ammonia.

Q Would that be subject to the same limitations on reporting that you were discussing earlier?

A Absolutely.

Q Thank you. When we're talking about transportation of ammonia on say a rural area of Interstate 5, and I'd like you to think about the possibility of release similar to the one that you discussed, can you tell me whether or not there's differences in the effects on motorists as between anhydrous and aqueous ammonia?

A Differences between the effect --

Q The effects on motorists. In other words, is there less effect on nearby motorists

when there's an aqueous ammonia tank rupture than there is if there's an anhydrous ammonia --

A Assuming the same size release?

Q Yes. I'm talking about in the immediate vicinity, the motorists that are in the immediate vicinity.

A Right. At the truck site, any vehicles that were tailgating, for example. The consequences would be worse for anhydrous because it flashes. The concentration would be lower than they would be exposed to.

Q But isn't it true that with an aqueous ammonia release, drivers could nonetheless be affected?

A Yes. In both cases drivers would be affected, but the effect would be far worse with anhydrous than with aqueous. Aqueous, for example, it's ammonia dissolved in water, is what it is. And it takes awhile for the ammonia to evaporate out of the water and get into the air. Whereas, anhydrous is a gas under high pressure and immediately flashes.

So the consequences of an anhydrous accident are always more severe than an aqueous accident. Granted, you would have significant

impacts on the motorists in both cases. But in one you could end up with a death, and in the other one you wouldn't.

Q Do you believe that the concentrations from an aqueous ammonia spill immediately over the area of the spill would never be lethal?

A It could be lethal, it depends on how much is spilled.

Q And can you answer just one quick question for me about the dissipation rate. The ammonia cloud, or the ammonia plume, as I've heard it referred to today, that could potentially affect motorists, does that dissipate more quickly if it's anhydrous ammonia or if it's aqueous ammonia?

A It would probably dissipate more quickly if it was aqueous ammonia. What happens in anhydrous ammonia, I see Rick over there shaking his head, is anhydrous ammonia is a dense gas. And when it's released, it releases up and then the weight of the gas compresses it down towards the ground. And so it doesn't disperse as readily as an aqueous ammonia release which comes off more slowly and is more dispersed in the atmosphere.

Q Has CURE proposed in their

recommendation for the use of aqueous ammonia, a percentage of solution concentration?

A No.

Q I'd like to turn now to your discussion about the routes that you recommend on page 11 of your testimony.

Is it your testimony that the use of a local distributor reduces the risk associated with transportation of ammonia to the Sunrise facility?

A Yes.

Q Would that be true if the local distributor obtained the ammonia from a manufacturer in Canada and it came via shipped from Canada to the Port of Sacramento, and then was transported down I-5 to the distributor in Bakersfield?

A No. I mean your point is well taken, and that highlights the need to do a transportation risk analysis. That's the kind of thing that you consider in a properly done risk analysis. You look at all the potential suppliers. You do a probability analysis. And you pick one that has the lowest probability.

That hasn't been done in this case.

Q So your recommendation is not only that

staff or the Commission require an analysis of the transportation of the aqueous ammonia from whomever Sunrise purchases it from its point of origin, the place at which it's manufactured?

A I would say, based on my understanding of how CEQA works, that the boundaries for the analysis should be the State of California.

Q What's the basis in CEQA for limiting the analysis to California?

A Well, you normally don't look outside the boundaries.

MS. POOLE: The witness isn't testifying to legal issues. I object to that question.

DR. FOX: Yeah, it's just my experience, you know, in working in CEQA issues, you don't usually look outside of the boundaries of the state.

BY MS. HOLMES:

Q Notwithstanding any limitations that CEQA may or may not apply, I think that what you're saying is that an appropriate way to do the analysis is to look at the risks associated with transportation of ammonia from the point that it is manufactured, is that correct?

A I would say from the point it arrives in

California.

Q Thank you.

HEARING OFFICER FAY: We have a pending objection. I assume, counsel, you withdrew --

MS. HOLMES: I withdrew the question.

HEARING OFFICER FAY: -- and rephrased your question? All right.

BY MS. HOLMES:

Q Is Sunrise recommending that -- excuse me, is CURE recommending that Sunrise only use ammonia that's produced in California?

A No.

MS. HOLMES: I have one question about the route issue that goes to the exhibit for which there is currently a pending objection. Would you like me to wait until you rule on the objection? And if it comes in I can ask it then, if not, I can wait, or --

PRESIDING MEMBER MOORE: Actually, we're in a position to rule on the objection. And perhaps that will tell you whether or not your question can come in.

HEARING OFFICER FAY: Yeah, I've discussed it with Commissioner Moore and we think, in light of our practices here, that the objection

must be sustained, because we just received this today. There's no argument as to why it had to come in at the last minute.

And it is a substantial exhibit that would take anybody quite awhile to go through. And it modifies, apparently substantially modifies what was previously filed regarding the ammonia transportation in Santa Barbara. It just creates the risk of surprise for this party.

And for that reason the objection is sustained.

MS. POOLE: May I respond?

HEARING OFFICER FAY: Sure.

MS. POOLE: I would like to point out that the witness only alerted me to this exhibit yesterday. And I certainly would have provided it sooner had I known of its existence.

And in several of the past hearings in this case, the motion to compel hearing and the first evidentiary hearing, the applicant has submitted documents that significantly affect those hearings at the hearing.

And I have objected once to that practice, and that objection has not yet been ruled on, to my knowledge.

And so I do -- and this is also a publicly available document, created by an agency of this state of which actually I think this Committee could take official notice.

So I do take exception to the ruling.

PRESIDING MEMBER MOORE: So noted.

HEARING OFFICER FAY: And we'll keep in mind your concern about your pending objection. And I'll just remind all the parties that it creates an extreme disadvantage if we get substantial materials at the last minute, whoever brings it in.

If you find yourself in that position you should contact the Hearing Officer immediately so that we can try to address this, whether it means delaying the hearing, or getting materials out to people in some unusual way.

But we just can't have this stuff coming in at the last minute, and then people caught flat-footed, unprepared to respond.

PRESIDING MEMBER MOORE: With that, we'd turn to the applicant. You're done, Ms. Holmes?

MS. HOLMES: No, I have a few more questions.

PRESIDING MEMBER MOORE: I'm sorry, I

thought you said you were done.

MS. HOLMES: Just on routes.

PRESIDING MEMBER MOORE: Sorry.

MS. HOLMES: Now, I'm ready to move on to restricted travel times.

BY MS. HOLMES:

Q That's on page 11 of your testimony, Dr. Fox. And you recommend basically that the Commission restrict the timing of deliveries to coincide with offpeak or nighttime hours.

I'd like to specifically focus on nighttime hours of delivery and transportation.

At night is it generally fair to say that meteorological conditions are more stable than they are during the day?

A Yes.

Q And isn't it true that in the event of a release the more stable meteorological conditions can create higher levels of impacts?

A Yes.

Q So, if a release were to happen at night, all other things being equal, the consequences are potentially greater than if the release occurred during the day?

A They could be somewhat greater, but as

we talked about with respect to table 1 in exhibit 2, we're not dealing with a substantial difference.

Q I would be referring again to the second row, the 1000 ppm column, it's your testimony that those differences shown between those two sets of meteorological conditions are not significant? Is that what you're saying?

A Well, you're looking at the 1000 ppm contour and --

Q That's correct.

A -- my analysis is with 75, so the numbers would be entirely different. But, yes, the consequences could be more significant at night, depending on the specific meteorological conditions that occurred.

But, likewise, if you're in an area like the San Joaquin Valley or the south coast, where inversions are common during the day, that could be far worse during the day.

I mean it's pick your poison. I mean there are bad meteorological conditions anytime.

Q Is it your testimony that you're more likely to have F stability conditions in the San Joaquin Valley during the day than at night?

A No, that's not what I said.

Q Is it more likely that F stability conditions would occur at night?

A I would have to do a frequency distribution of that data set. I don't know. I know that F conditions occur about 20 percent of the time. But I can't answer that with respect to night or day in a specific place without doing an actual frequency distribution.

Q Do you know whether or not per vehicle mile traveled the accident rates are higher or lower at night?

A No, I don't.

Q Did you consider what the effect of a release at nighttime would be on emergency response personnel?

A No, I did not.

MS. HOLMES: Thank you. I think those are all of my questions.

HEARING OFFICER FAY: Mr. Galati, I think we passed you by. Your opportunity for cross-examination.

CROSS-EXAMINATION

BY MR. GALATI:

Q Dr. Fox, exhibit 2 to your testimony

deals with the Redondo Generating Station, doesn't it?

A Exhibit 2 to my testimony, I believe --

Q Oh, that's Gaviota.

A -- is Gaviota.

Q So that's exhibit 4 to your testimony, correct?

A Exhibit 4, --

Q I'll try that again. Exhibit 3?

HEARING OFFICER FAY: Could you restate the question?

(Laughter.)

BY MR. GALATI:

Q Exhibit 3 to your testimony deals with the Redondo Generating Station, is that correct?

A Yes.

Q Do you know the generating capacity of that project?

A No.

Q Do you know if it's more or less than the Sunrise project?

A I don't know.

Q That project is located in the City of Redondo Beach, correct?

A Correct.

Q Can you compare the population of the City of Redondo Beach versus the population surrounding the Sunrise project?

A Yes. Of course, the population surrounding Redondo Beach is clearly larger than the population surrounding the Sunrise project.

However, it's not the population surrounding the project site that is of issue. It's the population along the route that the ammonia travels over.

Q And doesn't the route to the Redondo generating station involve going somewhere along the coast?

A Some of them could.

Q And didn't that study take a look at those routes?

A Not that I'm aware of.

Q It leads me then back to exhibit 2 to your testimony. I'd like to turn your attention to page 18, section 4, conclusions and recommendations.

Again, this study analyzed, as part of the analysis was the risks associated with different types of containers to supply ammonia to the Gaviota facility, correct?

A Correct.

Q And didn't the study conclude that the use of bobtails and/or one-ton containers for supplying the Gaviota facility will not result in a reduction of risk or one or more fatalities and injuries over that of MC331 trucks?

A You're reading from page 18?

Q Yeah, section 4, second paragraph.

A Yes.

Q Would it surprise you to know that 58 power plants currently use SCR with anhydrous ammonia in the State of California?

A No.

Q It doesn't surprise you. And I believe you testified earlier, and correct me if I'm wrong, that you did agree that the probability of an accident occurring is a function of how many miles driven, correct?

A Correct.

Q So, understanding you disagree with the applicant's probability number calculated from Stockton to the site, wouldn't any number either you calculated from Stockton or the applicant calculated from Stockton be lower if it were calculated if that anhydrous ammonia came from

LaMirada?

A If you used a probability number based on miles traveled, and if you do just that narrow calculation for LaMirada as opposed to Stockton, the probability would be lower for LaMirada because I believe it's 119 miles compared to 200-and-something from Stockton.

Q So when you say probability would be more, you said it would -- do you mean that there would be a higher probability of an accident occurring on the route from LaMirada to the site versus Stockton to the site?

A No, there would be a higher probability of an accident occurring on the route from Stockton to the site, because the distance from Stockton to the site is greater than the distance from the LaMirada to the site.

Q Okay. And, again, understanding you disagree with the number, would you agree that any number calculating the probability from Stockton to the site would be a worse case probability number based on Bakersfield, LaMirada or Stockton being choices of delivery?

A I'm not sure I understood that.

Q Okay. You stated that the probability

would be higher from Stockton to the site over LaMirada to the site. And I'm asking you if you agree that the analysis presented therefore presents a worst case scenario probability analysis, since it calculates the probability from Stockton to the site?

A Yes.

Q You testified that the NRC data, the National Response Center data, is identical to the HMIS data, is that correct?

A There's two things in the HMIS database. One of them is the -- there's two kinds of reporting that goes on, but falling under the HMIS banner.

The first is the telephonic report when an accident occurs. And that telephonic report goes to the National Response Center.

And then there is supposed to be a follow-up written report submitted within 30 days, and that goes somewhere else. And both of those are under the HMIS banner.

Q The National Response Center is under the HMIS banner?

A Yeah, if you look on the website you'll find discussions of both of them in there.

Q You used some references from the chemical engineering handbook, is that correct? Chemical Transportation Risk Analysis Guideline book.

A Yes.

Q What is the copyright date of your version?

A 1995.

Q Are you familiar with the HM-126F, which modified 49 CFR subpart (h)?

A No, I'm not sure I know what you're talking about.

Q Do you believe that at this point in time there is no requirement to report intrastate transportation accidents of ammonia?

A Based on the HMIS database and the material I just read to you, yes, the HMIS database, actually on the very first page when you bring up the website that was cited in Einolf's testimony states explicitly it's for interstate carriers.

I believe I have it here.

Q Would it surprise you to learn that HM-126F modified that portion of the CFRs and requires intrastate reporting?

MS. POOLE: Excuse me, can I clarify what HM-whatever-it-is is?

MR. GALATI: I'll have to ask my expert to qualify for it.

HEARING OFFICER FAY: Yes, it would help to get a description of that.

PRESIDING MEMBER MOORE: Thank you, Ms. Poole. I've been lax in my job on the acronym front, and I appreciate the boost. Simply --

HEARING OFFICER FAY: Would you give us a brief description?

PRESIDING MEMBER MOORE: -- spell out the acronym for us.

MR. EINOLF: Well, all of the Hazardous Material Transportation Act regulatory dockets are identified by the first two letters, HM, hazardous material, and then a numeric indicator following that.

126F was the revision based on studies done by the Office of Technology Assessment that revised reporting carrier safety and so forth, requirements, for hazardous materials carriers. And it was over a period of years, ranging from about 1994 into 1996.

The last piece of it made all federal

hazardous materials requirements, transportation requirements, including the DOT 5800.1 form reporting requirement, enforceable for interstate commerce.

So, since 1996 I believe, I'm not completely sure on the dates, but as of at least the last two years of data, '97 and '98, those include interstate commerce of hazardous materials.

HEARING OFFICER FAY: Interstate?

MR. EINOLF: Inter -- intrastate, excuse me. Inside the same state.

(Laughter.)

HEARING OFFICER FAY: Intrastate.

MR. EINOLF: Intrastate.

HEARING OFFICER FAY: Thank you.

Go ahead, Mr. Galati.

BY MR. GALATI:

Q Dr. Fox, are you aware of any incident in California involving the transportation of industrial ammonia where anyone had to be evacuated?

A No.

Q And I believe you stated earlier that 13 accidents in your testimony, none of those

occurred in California?

A That's correct.

Q Of the 13 accidents that you had in your testimony, were any of those involved in the transportation of industrial ammonia?

A Most of them were by major suppliers of agricultural ammonia. There are a couple of them that I'm uncertain of.

But that's not surprising because 90 percent of all ammonia is used for agriculture.

MR. GALATI: I have no further questions.

HEARING OFFICER FAY: All right. Any redirect, Ms. Poole?

MS. POOLE: Yes.

REDIRECT EXAMINATION

BY MS. POOLE:

Q Dr. Fox, I understood your explanation about the agricultural versus the industrial transportation to indicate that the tanker truck portion of those types of transportation are identical, is that right?

A That's right.

Q I may go back to a question that Ms. Holmes was asking regarding the 2102 hours that's

described, how you reached that number is described on page 7 of your testimony.

As I understand it that number was derived from the amount of times that ammonia tankers are typically on the road, is that right?

A Right.

Q Now, on the bottom of page 9 where you calculate your probability analysis, if you cut that number of 2102 in half because up to half the time the tanker would be empty, that increases this fraction and increases the probability, is that right?

A Point to where you're looking.

Q The bottom of page 9 where you have a fraction that says 149 hours over 2102 hours. It's the very last line.

Now, if you cut that denominator in half don't you increase that fraction?

A If you cut the bottom in half you increase that fraction. If you cut the top in half you decrease it. And I think Caryn was asking me about cutting the bottom in half, so, yes, you would increase it.

Q And that increases the probability?

A Yeah, it increases the probability.

Q Are you aware of any agency than perhaps the Energy Commission that allows -- that reduces the probability of an accident by the percent of time that the worst case met conditions occurred?

A No, I've never seen that before.

Q And you're familiar with EPA's RMP program?

A Right.

Q And California's RMP program?

A Correct.

Q County planning agency program?

A Correct. None of them allow that.

Q And the air districts?

A Yes.

Q I think there was some confusion about why the distance, the impact distance would increase if you were using a 75 ppm impact threshold versus a 1000 ppm impact threshold.

Can you just explain to us why that increases the impact circle?

A Well, when you have a release of anything the contaminant disperses or spreads out away from the source. And the highest concentrations occur close to the release point.

And then as the plume moves away it kind

of mixes with air and the concentrations decrease as you move further and further away.

So the highest concentrations occur very close to the release. And as you move further and further away the concentrations drop off.

So a 75 ppm contour would be much further away from the release point than say 1000 ppm contour would be because of the way dispersion works.

That's why table 1 of exhibit 2, when we were talking about that 1000 ppm column, I was careful to point out that that's not comparable to the analysis that we're talking about here, because it was 4000 ppm. You're close to the release point rather than 75, which is the significant threshold used by the Energy Commission.

Q Did you recommend the required use of CFA-certified drivers in part because of concerns about compliance with federal and perhaps state regulations?

A Yes, I did. And the reason that the CFA, the California Fertilizer Association, developed that program is because there is a compliance problem.

MS. POOLE: That's all the questions I have.

HEARING OFFICER FAY: Any recross, Mr. Galati?

MR. GALATI: No.

HEARING OFFICER FAY: Ms. Holmes?

MS. HOLMES: Nothing further, thank you.

PRESIDING MEMBER MOORE: None.

PRESIDING MEMBER MOORE: All right, with that let me just say that with your indulgence I am going to elect to not start the next segment, because I'd like to do it straight through.

I'd rather not start it today, run a half an hour, and then pick it up again. I realize that's an inconvenience for some people, and for that I really do apologize.

But we'll take this up again tomorrow morning and proceed until we're done with these items.

Thank you all and we're adjourned for today.

(Whereupon, at 11:40 a.m., the hearing was adjourned, to reconvene at 9:00 a.m., Friday, December 3, 1999, at this same location.)

CERTIFICATE OF REPORTER

I, DEBI BAKER, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Hearing; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing, nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 9th day of December, 1999.

DEBI BAKER

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