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ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

BUSINESS MEETING

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FIRST FLOOR HEARING ROOM

SACRAMENTO, CALIFORNIA

WEDNESDAY, JUNE 26, 1985

10:20 AM

REPORTED BY: DAWN LOFTON

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COMMISSIONERS PRESENT

Charles R. Imbrecht, Chairman

Barbara Crowley, Vice Chair

Geoffrey D. Commons, Commissioner

Warren D. Noteware, Commissioner

PUBLIC ADVISER'S OFFICE

Ernesto Perez

STAFF PRESENT

William Chamberlain, Staff Counsel

Dorothy Dickey, Staff Counsel

G. William Pennington

Michael Messenger

Ted Rauh

OTHERS PRESENT

John Oyer

Michael Gardner, Southern California Edison

Emilio "Gene" Varanini

S. L. Craig, Borg-Warner Central Environmental Systems, Inc.

Joe McGuire, Air Conditioning & Refrigeration Institute

Edward A. "Ted" Baily, Carrier Corporation

Peter Miller, Natural Resources Defense Council

OTHERS PRESENT

Marshall Hunt, Davis Energy Group

Ted Gilles, Lennox Industries, Inc.

David F. Lewis, Lennox Industries, Inc.

Bill Huston, California Building Industry Association

Dale Dassler, SnyderGeneral Corporation

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P R O C E E D I N G S

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CHAIRMAN IMBRECHT: Let the meeting please come to order. I ask you to all rise please and ask Commissioner Noteware to lead us in the flag salute.

(FLAG SALUTE)

Okay we have an obviously very full agenda ahead of us today. At a request of the Executive Director, in which I concur in, we have tried to group a number of contract items designated on a supplementary agenda provided to members of the Commission as Item A. I've been informed that Item 9 should be withdrawn from that list. Also I should mention that Item 8 has been withdrawn from the agenda completely. Item 9 we will take up separately, I believe sometime after our luncheon recess.

Since it's my anticipation that Item No. 1 will obviously entail a substantial amount of testimony, I'd like to suggest that we turn, first, to the so-called Item A (Designated Contracts) and see if we can dispose of that before we turn the remainder of the agenda.

For the purpose of the record, let me simply indicate that those items are, first:

. Item 5 which is a contract for $23,262 with American Aerial Surveys for acquisition of aerial photography for the Geyers area.

. Item 6 which is an amendment to an existing contact with the California State University of Chico to augment the existing budget by $4,699 for vegetation mapping in the Geysers area.

. Item 10, which is a contract for $75,000 with ADM Associates to revise and update the performance approach computer programs, associated user manuals, and prescriptive approach compliance manuals to include the new Retail/Grocery Non-Residential Building Standards.

. Item 11, contract for $44,300 with the Association of Bay Area Governments to develop standardized training materials to be used in training the building industry,

etc. with respect to the '82 Residential Building Standards.

. Item 16, a contract for $33,333 each. That's actually three contracts: one with the City of Roseville, one with the City of Pasadena and one with the County of Marin with respect to the Home Rating and Labeling project.

. Item 17, a contract for $25,000 with the City of Roseville to provide additional services under that same program.

. Item 18, a contract for $40,272 with Data General to renew the Maintenance Agreement with respect to our computer equipment here at the Commission.

I believe that's all of the items -- A Items. What's the pleasure of the Commission?

VICE CHAIR CROWLEY: Mr. Chairman, I would move approval of the contracts, revisions and updates to contracts in this list.

CHAIRMAN IMBRECHT: Is there a second?

COMMISSIONER NOTEWARE: I second it.

CHAIRMAN IMBRECHT: Moved by Commissioner Crowley, seconded by Commissioner Noteware, that the contacts, as enumerated, and the augmentations be improved. Does anyone wish to be heard on any of these items? Is there objection to unanimous roll call? Hearing none, ayes: 4; nos: none. Those contracts have been approved. I believe I should say for the record that I believe Commissioner Gandara will be joining us this morning. Commissioner Commons.

COMMISSIONER COMMONS: Point of information before you go into Item No. 1. At the last Business Meeting, you asked that I submit my concurring opinion on Geysers 21. And I have it; I just don't know the proper format in which to submit it.

CHAIRMAN IMBRECHT: It seems to me you simply submit it to the Secretariat. It was approved at the last Business Meeting; and so, it's simply a matter of being appropriately published with the remainder of the Order. Do you concur on that Mr. Chamberlain? The question from Commissioner Commons as to the appropriate procedure for his concurring opinion and the Geyers 21 AFC approval of the last meeting. And I suggest that he simply submit to the Secretariat for publication with the remainder of the Order.

MR. CHAMBERLAIN: Yes.

CHAIRMAN IMBRECHT: Okay. We'll now turn to the remainder of the Business Meeting. The first item to come before us is Commission consideration and possible adoption of amendments to Sections 1602(c), 1603(c), 1604(c), and 1606(c) of the Title 20 of the California Administrative Code. These are proposed amendments relating to revise the efficiency standards for heat pumps and three-phase air conditioners. Commissioner Noteware is the Presiding Member; and, I'll call upon you first to give your presentation.

COMMISSIONER NOTEWARE: Yes. Thank you Mr. Chairman. This item includes both heat pumps and air conditioners. There are people here who want to speak on both of these issues. And, we also have a staff presentation that I would like to suggest we start the procedure with. I think for the sake of brevity, we would like to have both the air conditioners and the heat pumps considered together or at least the presentation made together. And so, with that let me introduce Bill Pennington and Mike Messenger, who will be making the presentation for staff.

MR. PENNINGTON: Alright. Just briefly, Michael Messinger, who is the Senior Program Manager of the Appliance Program, will be making a presentation on the technical findings of the staff analysis.

MR. MESSENGER: Good morning Commissioners. It's a pleasure to be here. I'm pleased to report progress towards achieving one of the Commission's primary goals enumerated in the State Energy Plan; and that is, reducing peak requirements.

During the past six months, we've been engaged in an analysis to determine whether or not it was appropriate to increase the efficiency standards for heat pumps and, as such, reduce peak load in the number of our State's utilities area. In April, the staff released a report in which it made preliminary recommendations on the appropriate levels at which to set the efficiency. And on May 10th, the Committee issued its recommendation in a Notice of Proposed Action and then, essentially, admendments to the regulations which you have before you today.

What I would like to do today is give you a little bit of background information on heat pumps, talk about our findings in terms of cost effectiveness. Item 3 is to talk about how the proposed standards will be technically feasible and attainable. The fourth section we're going to talk about the importance that we feel of adopting these regulations today, and finally staff's recommendation. So, I'll go to the background information first.

Heat pumps are basically reversable air conditioners, which have the capability of both heating and cooling. And they are principally installed in hot valley climates. There are two main types of air source heat pumps: split system and single package. And also in this regulation, we are proposing to cover water source heat pumps which use water rather then air as the heat transfer medium.

Cooling efficiencies are measured using SEER or Seasonal Energy Efficiency Ratios like the air conditioners. And the heating efficiencies are the efficiency of providing heat to a dwelling, is measured using heating seasonal performance factors. The typical heat pump in California, on a weighted sales basis, uses roughly 3,000 KWh for cooling and 2,400 KWh for heating. This translates to a typical operating cost of around $432.00, using a statewide average energy cost.

Industry data provided during the proceeding showed that there were roughly 45,000 heat pumps shipped to California distribution centers in 1984. The salient point there is that there are a lot less heat pump sold every year than air conditioners. There're about 250 to 300,000 air conditioners sold every year and a lot less heat pumps.

Second section here up on the board there is our findings on cost effectiveness. We found that the proposed standards will save consumers between $203.00 and $472.00 on the life cycle cost basis, depending on which estimate of the incremental cost of providing this increased efficiency to the marked places used. The range of estimates is shown in Table A. And these, again, are the life cycle savings that we found in our analysis; and, they range, as you can see, from $203.00 to $472.00 -- again, differentiated by the different types of systems and whether or not you use market average cost, which is an average between Carrier's figures and other manufacturers or whether you simply use Carrier's cost data. Staff was unable to determine, and is sort of using as a range, whether or not market average cost or Carrier's cost data were more correct. So we're using both.

The next table shows the range of cost data or incremental cost data that was submitted to us. As you can see, there's a considerable amount of disagreement between the estimates. Nevertheless, using any of the estimates, the standards are still found to be cost effective. Now, there're lots of sources or reasons why these estimates may be different: has to do with production volume, distributor channels, markup

strategies in particular markets, and simply engineer's best professional judgment in terms of what they think they can produce in future years and what the cost is going to be.

Table 1 has an.... Excuse me. Let me go back my outline. Staff performed a number of sensitivity analyses on all the major parameters used in its analysis. In all thirty four cases that we analyzed in the staff report, the proposed regulations were cost effective. They were cost effective using a range of credible design life from 12 to 15 years, which a number of people are going to comment on today. There's a range of opinion anywhere from 8 to 15 years in design life that you'll hear today. But we believe the majority of the estimates suggest the design life is somewhere between 12 and 15 years. Nevertheless, it's cost effective using 8 to 10 years if the Commission finds that estimate to be more appropriate.

The table up there shows that, in fact, if you go down to 8 years as the design life, we will still be saving the typical consumer money. And I would emphasize that there has been very few manufacturers who would be willing to stand up and say: 'Our machine only last for eight years.' Because it's a very substantial investment, on the order of $3 or

$4,000, to put into a house. And so, people would like their machines to last 15 to 20 years.

The standards are also cost effective using a range of discount rates from 4% per year, real, which is what the staff believes is the appropriate discount rate to use, up to 10% per year, real. And again, real means adjusted for inflation. So the real discount rate at 10%, real, is closer to 15% nominal or 16% nominal. But when we use the word "real" that means taking out inflation. It's also cost effective, as I mentioned before, for split systems or single package systems of both 3 ton and 2½ ton capacity, which is the range of capacities that we dealt with in this proceeding.

Now, I would like to move to the part of my presentation that deals with technical feasibility and attainability. Basically, the level of compliance in terms of models currently in the market that meet the proposed standards for three years off, is the same as it was for air conditioners. Roughly, 30% of todays models comply with the proposed 1988 standard. From our perspective, that clearly indicates that a substantial number of models can be built that, therefore, the standard is technically feasible.

The second section is that the proposed regulations are attainable. Our review of our current directory suggest that 12 companies currently manufacture models which meet the proposed 1988 standard. These companies represent 75 percent of the market according to the appliance magazines that we've surveyed. We believe that three years' notice is adequate time to retool or replace the remaining lines to meet the proposed standard; and this discussion is...you can go into it at length in the staff report, which I believe you have in your backups.

Finally, we think it's very important that the Commission take an affirmative action today to achieve the benefits for both the consumers, the States and the States' utilities. It is more important to maintain efficiency neutrality in the market for cooling systems due to the pressures in the builders' submarket. It would be unfair for us to have a standard of 8.9 SEER for central air conditioners but not for heat pumps, which are, in fact, their primary competitors.

We believe it's important to address this potential unfairness in the market by setting the 8.9 standard to be effective at the same time, January 1, 1988, for both types of cooling equipment. These

standards will also reduce the peak demand in many of our State service territories where peak capacity costs are high and growing. Our estimate for SMUD's Service Territory territory, where there are roughly 12,000 to 15,000 heat pumps being installed per year, is that this annual peak savings in 1996 will be 60 MW. This would displace the possible need to build the gas turbines as proposed in SMUD's Reource Plan. On a statewide basis, we believe the peak savings will be roughly 200 MW by the year 1996 for heat pumps alone.

Finally, I would like to give you a little bit of background information on the options that you have before you. You basically have three options before you for your consideration. The first one is the option that staff proposed which has HSPF levels of 6.6 in 1988 and 7.0 in 1993. Those values where obtained using a regression analysis which I will bring you to in a second which found that if the typical model at an 8.9 SEER efficiency level had also a 6.6 HSPF level, and similarly, the typical model at 9.9 in the market today has a 7.0 HSPF level, so we felt there was important to keep those continuous and consistent. So those are the levels that we proposed.

Carrier Corporation proposed that the HSPF levels proposed by the staff and ratified by the

Committee and its Notice of Proposed Action be dropped slightly to 6.8 in 1993 and 6.4 in 1988. The net effect of that is shown on Figure 1. As you can see, the top line is a result of staff's regression analysis which we put through our computers. And, it tells us that that's the best fit in terms of what the relationship between SEER and HSPF is in the market. Below that we put a hypothetical line that would be used if in fact Carrier's recom-medation were adopted.

Basically, that will allow manufacturers a lot more latitude in terms of meeting the heating side. Because as you can see, there're very few models that are below Carrier's regression line. However, that's in fact, what Carrier would like to happen. They want people to focus on cooling efficiencies; and, that has a certain ring to it. Because we're mainly interested in reducing peak demand and not necessarily in achieving heating energy savings. So if the signal that we're giving by lowering these HSPF's is for people to primarily concentrate on cooling efficiencies, that's the message that we want to get out.

In sum, we would be able to support either of those recommendations: the 7.0 which we originally proposed and find no technical flaws in or Carrier's

analysis which is based on their policy preferences to continue design primarily for the cooling side of the market. So the bottom line is the staff supports the Committee's recommendation that it made in it's Committee Report that the June 6th amendment, which is basically an HSPF drop in the 1993 year but not in the 1998 year is cost effective for all California consumers and will represent an excellent move for the Commission.

And that concludes my presentation.

COMMISSIONER NOTEWARE: Thank, you Mr. Messenger. Yes. Ms. Dickey.

MS. DICKEY: My name is Dorothy Dickey. And I'm the attorney who's been assigned to this proceeding. I wanted to note briefly that the General Counsel and the Executive Director have determined that the proposed amendments are not subject to the CEQA initial study requirement. They have based that determination upon review by staff of the potential environmental effects to the regulations.

Staff reviewed the initial study and negative declaration that was prepared for the air conditioning proceeding and that was adopted by the Commission in December of last year. Staff determined that any potential effects of these proposed amendments would be

similar in kind to those assessed in the initial study and negative declaration, but will be reduced in scale because of a significantly fewer number of models of heat pumps and three-phase air conditioners sold. Based upon that analysis, the Executive Director and the General Counsel have determined that it is appropriate not to issue an initial study for these amendments.

COMMISSIONER NOTEWARE: Thank you, Ms. Dickey. Now, before we discuss the Committee's recommendation, there are a number of people I would like to call upon who are here to testify this morning. You have the cards over there. And I also would like to reserve the opportunity for Mr. Pennington and Mr. Messenger to respond and also our legal counsel, if that is appropriate. But rather than respond after each testimony's heard maybe you can take notes and summarize the things that you want respond to at the end.

MR. MESSENGER: That would be fine. I should note that I had not given the three-phase presentation yet; and, we will hold that until when you....

MR. PENNINGTON: I would suggest that we go forward with the Commercial presentation at this point. I think that's consistent with your opening remarks.

COMMISSIONER NOTEWARE: Okay. Let's do it that way, then, if you're prepared to go with that one. This is for the three-phase commercial type air conditioner.

MR. PENNINGTON: That's correct.

MR. MESSENGER: First, let me make sure. Does everyone have copies of the three phase presentation? It's a four-page handout. Okay. I'm going to try to make this presentation even shorter then the last one.

Basically, this rulemaking was initiated as a follow-on to the single phase air conditioner rulemaking. And that was.... To refresh your memory, the Commission adopted new standards for single-phase air conditioners in December of 1984. This is an attempt to make it consistent and make that standard apply to all air conditioners as rather then single-phase air conditioners. There is one other type of air conditioners, namely three-phase air conditioners. And they are mainly used in commerical applications.

They are used in commercial applications because in commercial application are usually higher voltage. And it's, generally speaking, easier on the wear of the system when you're hooked to up a three-phase motor rather then a single-phase motor. And the

single-phase are primarily used in residential application. So what we've done in this analysis is looked at what would the proposed efficiency levels do in a commercial setting where the three-phase air conditioners are primarily installed.

We found that the first bullet here is that there's general similarity between the air conditioners and there're major differences just in the circuitry and wiring which allowed the three-phase systems to be used with higher voltages. They're typically installed in low-rise office buildings with each unit cooling at floor air between 1,000 and 2,000 sq. ft. Sales of three-phase equipment in California have been estimated to vary between 20,000 and 30,000 units per year based on information in the forecast.

In terms of our cost effectiveness analysis, we analyzed, essentially using the same parameters as for the single-phase analysis, what the cost effectiveness would be. And we have a table here showing our analysis parameters.

This table shows that the hours of operation between commercial and residential air conditioners is different. Basically, in commercial buildings the air conditioners run on a full cycle for roughly 8 to 10 hours a day; because, there's higher internal loads

being generated in the building -- a lot more people, computers, other types of equipment exhausting waste heat. So while we found that the weighted average of hours in the residential sector was only 600 hours, for the commercial sector the weighted average hours was 1,500 hours. So as such, this equipment achieve a lot more savings than the residential equipment; because, it's used more. And so, every bit of efficiency that you can get in a system helps you out; because, the usage pattern is roughly 2½ times longer per year.

The other change in the analysis parameters was on the value of electricity; and, that is that there is a slightly different commercial electricity rate than for residential. And it's slightly higher in some years and slightly lower in other years. And we just use the commercial rate for the forecast, didn't have any appreciable effect.

Given these longer hours of operation and higher electricity prices, the benefits from an air conditioner used in a commercial building will be even greater than the benefits for the same piece of equipment used in a residential building, since the cost in both cases are the same, but the benefits are greater in the commercial case. The increase in SEER for the three-phase air conditioners is cost effective

under a variety of estimates. Up on the screen, I put Table 5 which is our sensitivity analysis. Under all the cases that we analyzed, using both DOE costs and estimates from the Trane Corporation, the standards yielded between $199 and $270 of life cycle benefit to the average commercial owner or commercial users of this equipment.

Turning to the technical feasibility analysis, that was basically very simple; because, the information that we had gathered in the single-phase proceeding also included three-phase equipment. And earlier we had found that the single-phase standards were technically feasible and cost effective at those efficiency levels. Since we're proposing the same levels, the same findings are applicable. We found that there's a substantial number of models in compliance with the 1988 standard and that we believe that the models can be retooled so that they can become in conformance with the 1993 standard.

Appendix A is, essentially, a reprint from the staff report on single-phase air conditioners which shows the percentages available at the various efficiency SEER levels.

So our bottom line recommendation is that the Commission act to perserve neutrality in the market by

adopting standards which parallel the air conditioner standards for single-phase air conditioners and adopting a standard of 8.9 SEER in 1988 and 9.9 SEER in 1993. I should say that this recommendation was made in late April; and, it the Committee also endorsed this recommendation in its May 10th Notice to Propose Action. Thank you.

COMMISSIONER NOTEWARE: Thank you. Now do we have cards from everyone who wishes to speak on this issue this morning?

CHAIRMAN IMBRECHT: If you would please turn those into the Public Adviser's location. Alright. Thank you. Mr. Messenger, Mr. Pennington. First, I would like to call forward Mr. John Oyer, representing the Frederick Air Conditioning Corporation.

MR. OYER: I think you have my card. That's John Oyer, O-Y-E-R.

CHAIRMAN IMBRECHT: Yes. Would you please come...?

MR. OYER: I'm here to speak on a different topic having to do with type of thermal air conditioning and heat pumps. Hold that card until the conversation comes up.

CHAIRMAN IMBRECHT: Oh, I'm sorry. Excuse me. Okay fine. Mr. Michael Gardner, representing Southern California Edison.

MR. GARDNER: Thank you, Mr. Chairman. Good morning Commissioners. I will try to be even more brief than Mr. Messenger. I had provided a letter to the Commission with Edison's comments, dated June 18th. And I believe each of you were copied. I'm primarily here to respond to any questions that you may have regarding the letter. In summary, we support the Committee's recommendation for the cooling side efficiency levels. And we think all three of the options identified in the Committee Report on the heating side are reasonable and achievable and do not take a position supporting one versus another of those.

I would like to add one additional comment on the American Gas Association letter which was docketed. That letter essentially indicates they do not believe a 15 year design life for heat pumps is appropriate. We are aware of only two studies which have looked at a design life or service life of heat pumps. One is the Alabama Electric Study which is the subject of the AGA letter. The other was a survey done by ARI. They both would tend to support a 15 year life which is the assumption used by the Committee. In Edison's view,

that appears to be a reasonable assumption for design life.

With that, I would be happy to respond to any questions. I do have a technical person with me, if that would be of assistance.

CHAIRMAN IMBRECHT: Questions? You do reiterate your position, I notice on the letter, relative to re-examination of the standards that are triggered to go into effect in '93, as well.

MR. GARDNER: Yes, sir. Yes. And, by the way....

CHAIRMAN IMBRECHT: I mention that only since that's obviously consistent with my own position on this matter.

MR. GARDNER: My letter was silent as to the standards for the three-phase air conditioners. And I should add that we also support the Committee recommendation there.

CHAIRMAN IMBRECHT: Thank you very much.

MR. GARDNER: Thank you.

CHAIRMAN IMBRECHT: Former Commissioner Emilio Varanini, representing the Trane Company. It's always nice to have you with us, Gene.

MR. VARANINI: Fine. Commissioners, I 've been retained over the last several months as a

consultant to the Trane Corporation, Division of American Standard, Incorporated, to really look at the policy and the process implications of your proceedings on both air conditioners and heat pumps.

I think that what you should understand is that what you're doing here may be much more important than you initially sort of realize in terms of a sort of larger picture. I'm currently serving as an Advisor to one of the shadow energy future project that's being prepared for the next administration's advent in Washington and is supported by this administration. And California really has become a prototypical environment in which many of the ideas that these types of institutions are looking at are evaluating. And they're looking very, very carefully at what you're doing.

You are in the forefront of a whole plethora of developments ranging from forecasting all the way down to your synthetic fuels program. And you're also are in a situation where you run one of the few integrated programs in the United States. The National program or the State programs are bulkinized. And your programs really run from both an integral legislative base and are managed from a unified perspective. So in that sense, I think you need to slow down a little bit

and think through some of the implications of what you're doing. I realize that you're on timeframes and on time stresses that are very difficult. But I'd like to point out a couple of things to your attention today.

Now, one of the things I learned from Chairman Imbrecht, among other things, was how to count. I know how to count; and, I think that for purposes of today, I want to make a couple of sort of deeper type of comments, rather than simply engage in some of the exchanges that I have in the past.

First of all, you have a real fundamental double counting problem whether you know it or not inside these models and the implications of them. And I think you know that, really, inherently. You're running so many different programs that impinge on energy consumption, electricity consumption, that it's just intutive that there has to be some overlaps and gaps in those things. And I think one of the things that have been pointed by your friends in the building industry is that there really is a confluence of the standards that you're moving on today in your building standards. Now, we went through and we built an actual record from your record.

We extrapolated the entire record just to see what you're thinking about. And in doing that almost all of the Commissioners at one point or another have basically indicated that they believe there is double counting, that there is a problem between a performance standard system in residential construction and the use of prescriptive standards over here on certain appliances that impinge on the residential construction, particularly here space conditioning. You've all admitted that. If you go through the record, Commissioner Commons has raised that question a substantial number of times. The Chairman has raised the issue. Former Commissioners have raised it, as well. And we are trying to look at that problem really in the u-ris-tic (PHONETICALLY DERIVED) sense.

We don't know what the number are. But we think that it's pretty important to try to find that out, certainly in the longer run. Remember, you're setting standards, the stream of income of which or revenues of which or benefits of which are being measured in your 2007. That's a very, very long period of time. That's a very, very uncertain kind of calculation, to say the least. But we know right up front that you've got impingement problem. And I think you have some obligation, because of the nationwide

impact of these standards, to really at some point get that under control analytically.

You're using an algebraic modeling format in once sense, with your static model for this type of calculations, and then you built, probably, the premiere dynamic model in the United States and maybe even in the world, for purposes of the general environment. That dynamic model is discounting the values you're calculating today. You calculate them today and fly them here. And your other modeling efforts discount them as best we can tell from outside. It doesn't matter; all the models are black boxes, if one's going to attack modeling as some form of intellectual assault. So, we think that that's one big and serious problem.

Your staff has said that it can't calculate these things. It thinks that it's a very difficult thing to do. They said that on the record. They're not sure that the problem exist. And to the extent it does, they can't calculate it. Well, I think if it's something that they can't, it's something that they certainly need to work on and try to advance that.

In addition, if you are impinging on those standards. And your staff on the record said you were. They believe that this decision, actually affects the

residential building standards. That's a direct quote out of the record. If that's true, then you're doing defacto what you say you're not doing dejure. I think you've got to straighten that out; because, it going to be a very, very complicated situation as we go on into judicial review and other kinds of reviews of these processes. And I think you want to make sure that you got a good handle on it.

A second major problem that we see is that these standards lock in what's going to happen anyway. There's a lot of talk that you need these standards because they need to basically be able to factor properly for discounting power plants and discounting other types of supply side options. Well, the fact of the matter is you don't have any empirical data on that. You don't know; and, I don't know that. I can tell you that the two instances of empericism on your record: the PGandE data and that data coming from another source (that I can't recall right now) tend to indicate that you don't quite...reality doesn't match up to the modeling effort in terms of static modeling. And it may be off significantly because of exogenous variables, people aren't home, go on vacation, they don't run the thing night and day, and so forth and so

on. I think that's something to, at least, take into account--the factor.

If you're going to say you're setting standards that are taking place and you're merely locking them in so you can count them as against power plant displacement, then be sure that you have some feedback mechanism so that you don't get in the situation we were in the early '70s and mid '70s when we didn't know where we were and a lot of the large scale decision-making was done by dart boards and other auguries. So I think that's something to think about.

The third thing is: Who these standards are cost effective for? Let's eliminate some of the nonsense considering the mythical average person. We're really looking at some kind of entity that represents a majority. You could have an average person who's different than the majority of people, simply because of the way the climate zones and other systems break down in the State. You need to do a little bit of gamesmanship with your data to sensitize it to that and just see what's going on -- Where is the mode? Where does it fall? Is this thing a bell shape curve? Is it skewed left or right? You need to take into account at some point and time. Because you're making very large scale impacts. And you're doing

straightforward static analysis. I think that's important to take into account.

Finally, we've identified (and I'll leave this for the record) a whole series of details that need to be eventually straightened out. You need to disaggregate your models. You have to do something about old retrofit versus new construction. It's one thing to model or attempt to model new homes as a problem in a retrofit market, overlapping conservation programs, consumer behavior. The artificiality of this problem of design life, you need to take a hard look at that. You're getting totally conflicting data from inside the industry and from outside the industry, for that matter. And that's your call. It's really your call.

You need to think about price elasticity. This Commission led the United States in terms of figuring out the obvious -- that price elasticities in demand when prices went up would reduce electricity consumption. Now, you might think that if can reduce the consumer's cost of electricity, they might use some increment more in terms of cooling. One wouldn't simply assume that the consumer necessarily would be neutral to all of this. And I think that's important and then, finally, this uncertainty factor in the year

2007. That's a tough call, brave human being. It may be what you're paid to do; but, you better be very careful in those kinds of long range calls.

The final thing is, your staff -- and I think rightly so -- is watching peak very, very carefully. And the law is really designed at a different standard. The law is designed to deal with pricing--an average pricing to the consumer. And in watching that peak and the dichotomy could lead to some interesting results. You could set a SEER, it seems to me, that would end up increasing peak.

You'd increase the SEER and increase peak draw and not just the behavioral solutions either. You can get an industry that begins to figure out what's literally the cheapest way to get around your standard. And that might, in fact, lead to certain types of equipment that draw heavier on peak. When people are very, very warm, they turn on a machine that does double duty or has some extra kind of add-on that keeps its average system low, but pops up on peak. I think that's something that you need to think about.

My reaction is that you're under a terrific time constraint here, given laws and things that we worked on last year. Your staff is basically under terrific pressure in terms of having to churn out--two

people, basically turning out tonnage levels of analysis. And I think that in that sense, we've try to call to your attention to a whole series of parameters here that I think create problems, called some of the results into doubt and tend to take the technical aspects of this argument from this forum and move in into forums where there are, perhaps, more attained. And I think that's one of the problems when you're not sensitive to very large concerns coming from a bulk of your regulatees, as well as some elements of public.

And I would be happy to answer any questions. And I'll leave this with the Secretariat; and you can peruse it. I did give it to the Adviser; so, I think that there's been some time that they've had to resolve it. I also was very much appreciative of Commissioner Noteware's Final Report in the sense of the recognition of the uncertainties and the data problems that are created because of the substantial differences within the industry and their views of this matter. I think that was a very frank and very forthright statement of the level of uncertainty that you're operating under. And I appreciated that.

CHAIRMAN IMBRECHT: Thank you. To say the lease, your comments are always challenging from a linquistic and vocabulary standpoint. I pride myself

of my own vocabulary. But you always manage to stomp me with a couple of words.

MR. VARANINI: If I don't, I'll invent a couple for you.

CHAIRMAN IMBRECHT: That's what I was wondering, frankly.

COMMISSIONER COMMONS: What is peak?

CHAIRMAN IMBRECHT: Actually, I was curious about uristic. In any case. Commissioner Commons.

COMMISSIONER COMMONS: Just one comment, Gene. When you try to look at this on a national level, I think there are two other critical factors that you have to look at. One is that all of the economic assessment in California excludes peak. And if you're looking at what the nation ought to be doing or any particular state ought to be doing, clearly we've shown this proceeding that when we look at the capacity needs which is probably half the benefit that comes from peak. And so, I think it would be very cautious or prudent of yourself to take that into consideration.

In the same sense, also that when you look nationally, most states don't have a building standards and that integration problem that you identify. And you may have a chicken and the egg problem in appliance

standard on it's cost effectiveness as to whether or not it should be reviewed in light of a building standard or not. When you go national that problem becomes very different than the perspective, I think, in which you put it.

MR. VARANINI: I think that's true.

CHAIRMAN IMBRECHT: Any further questions? Commissioner Noteware.

COMMISSIONER NOTEWARE: Yes. Gene, you've given us a lot food for thought here. And I'm wondering if you have any very specific recommendations regarding this particular issue this morning that you would like to zero in on and be a little bit more specific about what you would like to see us do.

MR. VARANINI: Well, I would just say, I'm not really authorized to represent Trane in the sense of either concessions or negotiations. But from a third party perspective, from my own basis of analysis of the process part of the record, I would be very, very disturbed trying to set a standard in 1993 that has a flow-through effect through the year 2007. I don't think you have the data. I don't think you have the sensitivity analysis. I think that your static models are fine as far as they go. But, I would not

want to make a call over that very, very long period of time.

Now, the Commission identified that on a split vote the last time. And I think that one should think through whether the principle is more important than symmetry. Or the principle of being able to call something in 1993 and the uncertainty through the year 2007 is more important than maintaining some form of symmetrical regulation.

And the reason for that is, is because as you all know, the standard is different if you want to go back and fix it. Commission Commons, in what I think was a brilliant maneuver at the time, was able to negotiate into the statute that passed last year, the affect that, if you put a standard in, you use one type of an economic analysis; if you take a standard out, it appears to some, in the reading of that statute, you use a different kind of analysis. And the analysis begins to shift from a consumer base to a ratepayer base. And I think that makes it much more difficult.

I think your comment in your report would be appropriate if there was not this difference in standards in how you're going to have to treat people coming and going. You also know that if you go and back off of a standard, then you have to go back and

redo your forecast--your longer range forecast. And I'm sure you'll end up with that type of issue moving on to supervision by the judicial branch as well. There are too many players in this. And the standards of an offer is approved and the types of judgments you are supposed to make are just queazy enough that it seems to me it is not a simple matter to lateral this to Commissions coming after you and say, "Well gee, if we were wrong in year 2007, maybe in the year '91 they could fix it.' I would be very careful about that. I think that's the critical issue from my perspective. The appliance certainly have a much more analytical and engineering base set of concerns. But those would be mine.

COMMISSIONER NOTEWARE: Thank you.

CHAIRMAN IMBRECHT: Quite candidly, that's generally reflective of my own views I've expressed on a number of occasions. I think with the volatility that we've all observed with respect to energy supplies, relative availability of variety of fuel sources, etc. and forecasts, that at one point or another predicted dire consequences and, in fact, obvioulsy have not at least near-term proven to be true, I remain more of a viewpoint that it would be more rational to revisit this entire subject out

towards the end of this decade in anticipation of still providing the industry an adequate amount of leadtime to reconcile new standards that will trigger in '92 or '93.

At the same time, and of course it's also difficult to understand whether, in fact, we are a driving force that has produced some these results, but I have to at least in a sense take constructive notice of what's happening with respect to the ASHRAE promogated guidelines or standards as well, which seem to have a fair amount of symmetry as well with that which has been adopted here at the Commission.

MR. VARANINI: I think the other thing, Mr. Chairman, is that one of the interesting things, if you look at how you affect other interests or the number of foreign interests that are on your mailing list, this is not a small potatoes kind of situation. It looks to me like it would be very interesting to take the entities that are on your service lists and on your mailing lists and see which of those are currently in this business and which of those may be doing strategic planning to enter or intersect this business somewhere out of the time frame that you're guessing at, and who don't have some cost in set technology, and who don't have some cost in re-cooling, and whether or not there

really are some very important implications to what you're doing in terms of one of those more substantial markets in the world. We're still maintaining about a 6th or 7th level economy in the ranking of the economies in the world. And, I'd be very careful. And, I think it's particularly important that these interests are watching what you're doing extremely carefully.

CHAIRMAN IMBRECHT: Commissioner Commons.

COMMISSIONER COMMONS: Since we're discussing this one item, I'll make a comment or two on it. If we don't have the second step, if we build power plants, the main reason costs of energy go up in the State of California is the building of power plants. And, unless we change the method by which we site and estimate demand in this State, the second step would essentially result in some 1,000/2,000 MW of additional power plants. And, in the northern part of the State that would, particularly have economic significance where we have no need for energy and we primarily have a need for capacity. And, we'd be passing on a major cost through the ratepayers.

Second is, by giving industry advanced notice we're really following what ASHRAE has done with the two steps. We're going to result in more competition

in the market and a lower cost of the product; because, the design engineering of these products requires more than two or three years to make any significant improvements. And so, by putting out a notice seven or eight years, by the time you go from design or the initial engineering of the product to the market testing, approval, licensing, distribution, manufacturing changes, you require that time. And, that's been clear from the industry if they're talking about anything other than a minor change, that they do this.

The alternative of going and saying this is cost-effective and putting it all in affect in 1988 would have such a dramatic affect on particularly the smaller and medium size manufacturers. Essentially, what we've done is, we're saying: 'This is what we'd like to see you do. But, we're going to give you an extra period of time and, then a return on the investment of those people.' (Which has been requested by industry as five years to get that initial investment out.) And so, essentially, what we're doing is not having a two-step standard. We're having a one-step standard, but giving leeway to the industry to make that capital investment so we can keep the cost of the product down and allow the companies to do their engineering in a judicious way.

And then, the last point is that you talk about 2005, we're going and siting power plants which will be built in the late 1980s, early 1990s. And, they'll be around in 2020 and 2030. And, that's where the big decisions, in terms of capital investments of this Commission, are concerned. And, we've got to integrate in terms of.... We're looking at conservation as a supply resource. Certainly, there's uncertainties. But, we're still going to go and site those power plants. And, if we make an incorrect decision here or there, at least it's going to be an integrated decision. And, what this Commission has very hard argued is, we're looking for a balanced portfolio. We're not going to put all our investment into one area. We're not going to put it all in conservation. We're not going to put it all into oil and gas facilities. And so, we've balance that, I think, by taking the approach that the Commission adopted under BR V.

MR. VARANINI: I think that many of those are laudatory goals. I think that if you put the same effort into this particular type of decision that you put into power plants then, I think that you certainly could sit there and say that you can trade off the values because you have a certain level of confidence.

It seems to me, if you use a simple static model and you're trying to make guesses about the future, spending literally thousands of dollars on that and millions on your model for making these other decisions, that you really have a system that has produced and put its values where it feels its regulatory muscle and implications are. But, you haven't balanced them out analytically.

Secondly, in terms of the long-term future, we, collectively, haven't sited anything. What's actually happened is that the uncertainty analysis on these very large (INAUDIBLE) have actually crippled the process. And, I think this Commission has adopted a wholly different philosophy, that you want to go with smaller, shorter lead time, less intrusive plants. And, you've done that simply to get around that problem of guessing and betting the company on just massive projects.

So, it seems to me that if you put an equal level over of analytical effort and if you are confident you know what you're doing or, at least, anyone in your situation would know you had the most reasonable amount of data that you could process in front of you then, I think, it's perfectly appropriate to use that as your balance lever on decision-making.

CHAIRMAN IMBRECHT: Okay. Thank you very much. I don't believe there are any other further questions. Appreciate your presentation. Next, Mr. S.L. Craig, representing Borg-Warner.

MR. CRAIG: Good morning, Commissioners. Rather then read my statement word-for-word, I will try and paraphrase it to, perhaps, save some time.

COMMISSIONER NOTEWARE: We'll appreciate that.

MR. CRAIG: First of all, we have some observations about the staff report and so forth. And, I don't think we need to get into an argument about it. It's not infallible; andm there are some errors and some misleading statements. And I'll just mention one or two here for your guidance.

The real issue, of course, today is what we propose to come up with as a standard for heat pumps and three-phase equipment. We have made a couple of recommendations. First, in general, we think that there should be only one level (that's the one for 1988) and then, of course, to make a goal or so forth for 1993. I just heard the address by Commissioner Commons; and, I understand his feelings on the matter. We have the opposite view. We feel that we're laying on the next generation something that they should

decide and not ourselves. That's one of our recommendations.

The other has to do with three-phase equipment. The proposed standard is using a residential descriptor rather than a commercial descriptor by siting SEER rather than EER. We've spoken to that before. We feel that it should follow the pattern of the industry and use the EER and COP for three-phase, and SEER and HSPF for single-phase. And, we think this is important if you ever intend to use the ARI Directory as a vehicle for enforcement. Because, this is the way we are now published in our certified ratings.

One thing which is not in my report and which I'll mention just now, since we're talking about commercial, when we talk about power plant siting and so forth, I just read read recently where some of the buildings are coming in over their estimated usage because of personal computers. It seems that every employee now has to have one. And, in some cases it's using twice as much energy as had been anticipated. So, maybe you better take a look at what's going on in this phase of the industry.

The next item which I would address is heat pumps. And, it's always been customary in the past and

in most of the standards that there's a differential between heat pumps and air conditioners. And, there's a good reason for that. And I've made a very simple diagram and have attached it to my notes. And you can see the difference because of the added components that go into a heat pump system.

We have reversing valves, accumulators and additional refrigeration circuits within the system, plus an additional refrigeration charge. When you take all these things and exposed surface to the atmosphere, pressure losses within the system, obviously, you cannot get the same efficiency out of a heat pump as you can an air conditioner when you use the air conditioner as a reverse cycle unit. And, this is typically what is done in order to have economies of scale in the manufacturing process.

A couple of losses which are not too noticeable from the diagram is in the design of a condenser itself. As the velocity.... We try to keep the velocity of refrigerant gas up as high as we can in order to get the maximum heat transfer. So, with an air conditioner and the outdoor coil, we usually limit it to one or two circuits. And that keeps the velocity high so that we get the high efficiency.

Well, as you know, in the heat pump the outdoor coil now becomes the evaporator. And we have liquid in there instead of gas; and we got to put in additional circuits to take care of the flow of the liquid rather than the gas. But, when we reverse it again, back to an air conditioner cycle, we got these additional circuits and, of course, we lose the efficiency. And, also, in refrigered charge, I mentioned that more charge does accumulate in the accumulator in the off cycle. And when it starts up it takes it many minutes before the flow rate arrives at its peak performance. So, all of these things add to a loss in efficiency. And, it's our recommendation that it be at least a differential of half a SEER between air conditioners and heat pumps.

I guess our real big concern is the product availability. Mike Messenger did show you the diagram that he had made up using the current Figure 1 from the staff report showing where the good and the bad fell. And, I have done the same thing for split systems. And, it's not too difficult to see that about 75% of the products will be eliminated on January 1, 1988, another 15% on '93. Of course, we're going on the supposition that, yes ,the manufacturers will redesign before that 1993 date, in plenty of time, etc., etc.

But, actually, when you look at the market for heat pumps in California, it's somewhat less than 40,000 units a year for split systems. I'd say there's no incentive there for a manufacturer to try to turn his operation around and design a product line consisting of seven models, or at least six models to meet such a small demand.

The package units is even worse. If you look at the Figure 2 on the sketch, you can see that there's only two models that really qualify in 1993. And, there, we're talking now about less than 20,000 units to a manufacturer. And, there is really no incentive to try to redesign the product. So again, we're recommending that we maintain at about a 5% differential between heat pump...5%... .5 SEER between heat pumps and air conditioners.

My final comment has to do with HSPF. I think the diagrams that have been shown show that there is no correlation between HSPF and SEER. There's been no other testimony given to that affect. So, we really can't draw a straight line and say, 'Hey, this is what it's going to be.' Our only comment, at this point, is that we really don't know. We think we should give this as much latitude as possible to the manufacturers for the design of the equipment. And, we would simply

recommend the lower HSPF which have been offered as alternates to the standard.

That's my comments and I appreciate the opportunity to speak before the Commission. I'll answer any questions.

VICE CHAIR CROWLEY: Commissioner Commons.

COMMISSIONER COMMONS: In the states that are really hot and stays hot at night -- Arizona, Texas, some of the sunbelt States -- don't they buy much more efficient equipment than in California? Because, the cost effectiveness, obviously, would be greater when those hours start going up to 1,500 hours.

MR. CRAIG: I'll tell you, Commissioner. In Arizona, for instance, in Phoenix, Arizona, and in Texas, particularly, they have a number of incentive programs operated by the utilities which do tend to force higher efficiency equipment into those markets. And, yes, I would say that higher efficiency is sold there; but, it's for a different, maybe from not a cost-effective but from just the incentive part of it. And, we do provide high efficency equipment; and it's worth it. Yes.

COMMISSIONER COMMONS: That would tend to increase the.... California is not at the extreme in terms of the need for air conditioners like a lot of

the states. And, I would think a lot of the other states would, just in the market, be demanding air conditioners more efficient than people would in California. I can't understand why there'd be a product availability problem when these other states are so much hotter and more humid, and, particularly the nighttime temperatures don't drop.

MR. CRAIG: Well, at the present time, the 9.9, I don't think there's.... I'll have to go from memory. I've forgotten what the actual top level is right now for incentives in both of those areas of Dallas and Phoenix, for instance, and some in Florida. To my knowledge, they have not reached the 9.9 level. But, I'm just guessing at that. And, of course, in packaged units, they're not too common in those markets. Well.... Phoenix is packaged; but, the others are not a common product.

VICE CHAIR CROWLEY: Thank you. Did you have some comment?

COMMISSIONER NOTEWARE: I just wanted to assure Mr. Craig that he should be careful about saying things about those personal computers; or, people will be telling us that we should set minimum efficiency standards on PC's next.

MR. CRAIG: That may be your next approach.

VICE CHAIR CROWLEY: Thank you, Mr. Craig. We have Mr. Joe McGuire of ARI who wishes to comment.

MR. McGUIRE: Good morning Commissioners. First of all, what I'd like to do is submit for the record some explanatory material regarding an exhibit that I submitted during the hearing of May 24th. And, this is at the request of Mr. Wheatland of the Commission's legal staff. So, I'll leave this document here with the letter for inclusion in the record, if I may.

VICE CHAIR CROWLEY: If you would.

MR. McGUIRE: I would also like to clarify one point before I begin my testimony. And, that has to do with the staff's document, dated June 19th, in which they respond to several of the comments raised at the hearing in May.

On page 6 of that document, staff indicates that data submitted as part of this rulemaking that had to do with heat pump shipments to the different cities and counties in California was originated from ARI. And, I've pointed out in May that that is not the case. The information was submitted by Mr. Baily of Carrier. And, he may have made some interpretations of data from ARI originally. But, the data that is part of the record is not ARI information. And, our statistics

program does not furnish information at the county level or the city level. It is by certain trading area reports and does not break out by capacity or efficiency. Thank you.

My comments today, I'm certain, will not be a surprise to any of the Commissioners. But, I will reiterate some of the points we have made throughout this rulemaking proceeding for the record.

On behalf of a majority of our members -- the manufacturers of central air conditioning heat pumps and three-phase air conditioners -- ARI is opposed to the proposed revisions of the minimum efficiency standards which are 8.9 SEER for 1988 and 9.9 for 1983. We have suggested and continue to recommend that the revisions to the Standards be no higher than 8.5 SEER for 1988, and, that the Commission not enact a second tier of the Standards at this time. This proposed revision, we feel, will provide a cost effective revision to the Standards in California. And, it will also not adversely impact small manufacturers of heat pumps and central air conditioners as would with staff proposal.

In the staff's analysis of the impact of the proposed Standards on small businesses, we feel they fail to focus on the impact on small manufacturers, but

focus solely on the impact on contractors or those who sell the equipment. The heat pump and air conditioning manufacturing industy is made up of many small and medium size companies that compete with some of the larger companies. And, if I could turn your attention to the chart being put up on the screen. This will show the impact on ten small to medium size companies that participate in the ARI Unitary Certification Program for Heat Pumps and Central Air Conditioners.

The bar charts there point out the impact of a 8.9 SEER standard on these companies and their product availability in a single package, cooling-only mode, a split system, cooling-only mode and the third for heat pumps. And, the heat pump category is for both types of heat pumps. Heat pumps also are in single package and split system. As you can see by that chart, none of the companies there really have a significant amount of models at this time that meet the 8.9 SEER standard.

What this means is that virtually all the smaller and medium size companies are going to have to do almost a complete redesign of their product lines to meet these standards. And, while some of the larger companies will also have to go through some serious

redesign, they will not have to do their entire product line.

And, the staff also addressed the issue of how these standards impact small companies in their June 19th document. But, they did not.... They simply looked at the model availability for the industry as a whole, and, really did not focus on what can happen to the smaller and medium size companies. And, we think it's very important that these standards really will have a significant impact on these types of companies.

Just as a comparison for a different level of standard, what ARI is proposing is that the efficiency be no higher than 8.5. As you can see in this chart, these same companies are in a much more realistic position to meet that standard. And, would certainly have to do some redesign of their product lines, but, would not have to go through as drastic a step. So, we would urge the Commissioners to weigh heavily the impacts of these provisions and proposals on the small and medium size companies.

We also believe that the imposition of a second tier standard for 1993 is unnecessary and serves no useful purpose to either the consumers of the State of California or the manufacturers. It is premature for the Commission or the staff, at this point, to

attempt to predict the needs of California for 1993 with respect to the efficiencies of central air conditioners and heat pumps.

As far as a reference point for manufacturers to target, the 1993 level serves no useful purpose either. Planning periods for new products do not extend to 1993. Also, as you certainly are aware, many circumstances can change before 1993 to render that number irrevelant. We had hoped, through our presentation of shipment information in many of the Proceedings in the last two years before the Commission, that we have demonstrated to the Commission that a positive trend in increasing efficiency as a product is occurring on a national basis.

California Energy Commission believes that this trend is not enough to ensure energy conservation in a state with respect to our product. While the industry may disagree with that, we understand that the Commission is intent on regulating these products. But, at the same time, we would employ you to be reasonable in focusing in a role of minimum efficiency standards. We have attempted to point out that minimum efficiency standards should not remove cost effective products from the market. The State of California has

an immense variety of climatic conditions, essentially embodying all the types found in the United States.

How can a minimum standard be cost effective for the people of Los Angeles and San Francisco? It cannot, unless it is set at a level that does not preclude the purchase of lower efficiency units that are not run as much as units in more severe conditions. While the shipment weighted average of heat pumps on a national basis last year was 8.4 SEER, this does not mean that purchases of units below that level are not cost effective. The Warren-Alquist Act balances the goals of a sound energy policy with economic realities.

I would suggest that the Commission analyze the Act from that perspective and request that the Commission vote against the second level of standards as an unnecessary step. And, perhaps, if you feel that focusing on 1993 is important, perhaps, that level could be viewed as a goal or a target, rather than a mandatory standard.

With respect to the heating descriptors and HSPF, the staff has indicated that it believes HSPF is the proper heating descriptor for the single and three-phase products below 65,000. They had asked us (ARI) to consider modifying our directory to include this information. I pointed out in May that at the present

time our certification program uses COP as the heating descriptor three-phase equipment. And, a majority of the participants in that program continue to favor that. And, this will be brought up time and again by our section in the near future. But, at this point, the majority of the companies feel that COP is the proper descriptor on the heating side for three-phase equipment.

Regarding HSPF levels, the Commission favors the original HSPF levels as proposed by the staff. We would suggest that they should be prepared to obtain relevant cost information for increasing the HSPF to these levels, as this information was now requested in the workshop proceedings.

Regarding water source heat pumps, ARI would recommend for 1988, an EER of 9.0 where the heating efficiency COP of 3.0. ARI would, again, urge the Commission not to set a second tier standard for these products at this time. Our members, however, in response to ASHRAE indicated that 1992 levels should be not higher than 9.5 EER and 3.2 COP.

For three-phase air conditioners, I would point out, that we believe staff has made some broad generalizations about this type of equipment as to its cost and the application of the products. And, it was

sort of tagged on at the end of the rulemaking. And, I believe, not given the proper amount of attention that it deserved, ARI has no concensus as to whether SEER or EER is a proper descriptor on the three-phase equipment. We would, however, recommend that if SEER is chosen as the descriptor for three-phase equipment, it be no higher than the same level as that for single-phase which our recommendation was 8.5.

Rather than going through the other kind of general comments I had, which I also brought up at the May hearing, I would ask the Commissioners to review, if they could, material I submitted in May which was prepared for the ARI in conjunction with the Biennial and Electricity Reports which we feel brings up several policy-type questions which Mr. Varanini, I think, touched on some of them today, as to how the legislation and how the role of the Commission filters down to the actual development of applying standards.

I would end my remarks there and would ask the Commissioners to try to view this rulemaking as to its impact on all of the parties involved, and, hope that you would analyze all of the information that has been submitted at this point into the record. Thank you.

CHAIRMAN IMBRECHT: Commissioner Commons.

COMMISSIONER COMMONS: Joe, if the single-phase standard were 8.9, would you want to see that the three-phase standard would be consistent, in any event, with what the single-phase standard is on commercial?

MR. McGUIRE: The.... To be honest with you our manufacturers really do not have the time to focus on that question as it pertains to this through the ARI forum. It came up late in the rulemaking. And, I would really have to defer to our individual companies at that point. I would just stick to what we have put into our statement.

CHAIRMAN IMBRECHT: Mr. McGuire, have you been able to ascertain that question that I asked you yesterday? Namely, what market share of the so-called small companies represent...?

MR. McGUIRE: I have not got a specific answer, since the ten companies that are put up on the chart over there. I do not know the exact companies that were, since our statistics department picked those. I did talk to our statistician; and, he said that they do represent a significant share of the market. But, in terms of the precise amount, he could not give that to me.

CHAIRMAN IMBRECHT: My question remains.

What is significant? Is it 10%? 20%? 30? I mean, even a ballpark idea?

MR. McGUIRE: Well, not being the ARI statistician, I would guess that it is higher than 10% for the ten companies. I would say that's probably significant.

CHAIRMAN IMBRECHT: I guess the other question in terms of impact, even your chart that showed 8.5, if I recall correctly, there is only one company that has 50% of its product line meeting that. And most of them actually were down in the 20% level. I would have to say that the comparison of those two charts, I did not find persuasive in terms of the suggestion. There would be a dramatic difference in terms of impact of redesign on those companies between 8.5 and 8.9. I mean, as a practical matter, over half of the product line of all those companies would have to be redesigned, in any case. And I guess the question I would ask is: If they are going to be redesigned at 8.5, why is it so dramatically different for them to be redesigned at 8.9?

MR. McGUIRE: I think there would be added expense to go to the 8.9 level. And you are redesigning, virtually, all the product line, which I

think is more significant than owning a percentage of it, even if it is 50%.

CHAIRMAN IMBRECHT: I'd suggest you overlay those two charts. There is not a dramatic difference, it seems to me. My personal viewpoint is -- and I'm not going to be redundant about this -- it remains the same relative to second tier standards. And I have expressed that on numerous occasions. But, in terms of first tier, I'm not sure those charts really convince me that there is a substantial contrast in terms of the impact on small companies between 8.5 versus 8.9. Since, as a practical matter, the majority of the product line would have to be redesigned, in any case. I will leave it at that. Alright. Further questions for Mr. McGuire? Thank you very much.

MR. McGUIRE: Thank you.

CHAIRMAN IMBRECHT: Mr. Ted Baily, representing the Carrier Corporation.

MR. BAILY: Good morning, Mr. Chairman, members of the Commission. I'm Ted Baily with Carrier Corporation.

Carrier submitted considerable testimony as this proceeding has gone on. And I do not intend to recapitulate what we have already said. But, merely to go on record as being in complete and full support of

the Committee's recommendation to establish energy efficiency standards for heat pumps and three-phase equipment in 1988 and 1993 at the levels proposed. Our only concern that would not be in complete support would be the recommendation for Alternative 3 on the heat pump heating mode, the HSPF values. And we have information on record with you on that, as well. However, there were a few additional thoughts that I felt might be well to put on the record. And if someone could help me to pass this out, I would just like to have you each have this brief statement in front of you as I read it.

"Carrier Corporation is on record in this proceeding in support of the Appliance Programs Committee's Alternative 3 for Heat Pump Heating Mode Standards. Our reasons, in addition to prior comments are: 1) 6.6 HSPF, coupled with 8.9 SEER, would increase the complexity of any redesigning which might be needed to meet the 1988 standard. This could have peculiar particular impact on small and medium-sized manufacturers. 2) An HSPF level which is too high in relation to the SEER requirements has the potential to raise equipment cost to consumers if HSPF becomes the dominant design criterion. 3) A four-tenths spread, that is, 6.4 to 6.8 HSPF, between the 1988 and 1993

requirements, is consistent with the 8.9 to 9.9 SEER cooling mode spread. Two-tenths is not. As you may be aware, the American Society of Heating Refrigeration and Air Conditioning Engineers voted this week, in Honolulu, to send out for public review and comment, the proposed revisions to ASHRAE Standard 90. The values that they used were for 1998, 8.9 SEER and 6.4 HSPF. For 1992, 9.5 SEER and 6.6 HSPF. The ASHRAE 90 Committee felt that a 7.0 HSPF for 1992 was inappropriate to set at this time, and that a four-tenths differential was consistent with the SEER values proposed. Carrier respectfully urges the Commission to consider the adoption of Alternative 3.

CHAIRMAN IMBRECHT: Commissioner Crowley?

VICE CHAIR CROWLEY: I have a question on your presentation paper. I don't understand that 6.4 by ASHRAE to 6.6 is a four-tenths differential. And I'm confused.

MR. BAILY: That's a very good catch of a typographical error, Commissioner Crowley, that I'm sorry that we made. That should be 6.8....

VICE CHAIR CROWLEY: Thank you.

MR. BAILY: ...as is stated up above at the beginning of Paragraph 3. Thank you for correcting that error. I sometimes look at things without my

glasses and sometimes look at them with; and, they still get by. Thank you.

MR. BAILY: I do have a couple of other brief comments. The first has to do with product availability. We heard some comment made on that subject this morning. I have heard other comments made throughout the proceedings. I cannot speak for other manufacturers in terms of being able to have--able and willing, I guess I should say--product available in the California market which meets the standards on the date of effectivity, or they were manufactured before that date. But, as we have said before in previous proceedings, Carrier will be glad to supply all of the equipment the California consumers require at the mandated standards level at the time of effectivity.

CHAIRMAN IMBRECHT: I'm sure you would.

MR. BAILY: Thank you very much, Commissioner. As yet, however, our competition has, by no means, allowed us to make good on those promises; nor, do I expect that they will in the future.

The last item that I'd--the next to the last--that I would like to touch briefly on is the matter of equipment life, which as we all recognize, is a very important factor in the equation to determine consumer cost effectiveness. As a matter of fact, I understand

that equipment life is receiving a great deal of comment lately. And there is a considerable disparity of opinion as to how long one might expect a heat pump of today's generation to last in normal use and service and maintenance by consumers. We agree, as we have right along, during the Air Conditioning and the Heat Pump proceedings, that 15 years is an entirely reasonable and justifiable level to use in this type of analysis. We believe that the Alabama Power Company Study, which you have an opportunity to review on the record, gives us, for the first time, a detailed and definitive study as to what actually happens in the installed situation where it was to possible to measure the life of heat pumps by a utility.

Manufacturers, in addition, have supported the 15 years criterion. And I would like to read you three letters along that long, all from major manufacturers. And, again, if I could have some help, Bill, I would like to pass these out to the Commission. The way they are stacked up is in inverse order to the order which I would like to present them, going from the back. And then, I will to begin until you have your copies.

At the back of the collection is a letter from Carrier Corporation, dated May 20, 1983, written

by myself to Michael McGrath of the Edison Electric Institute, which is consistent with the comments of Carier Corporation at the Air Conditioning and Heat Pump proceedings.

"Dear Mike:

We share your concern over the Median Years shown on Table 1, "Equipment Service Life" in Chapter 45 of the 1980 ASHRAE Handbook. Our specific concern is over the ten years shown for residential air-to-air heat pumps, particularly when one compares that estimate to the 15 years shown for residential single or split package units.

At Carrier, the design life standard is identical for residential air conditioners and residential heat pumps."

The second letter, also written to the Edison Electric Institute, is by Robert L. Stevens, Vice President of Marketing for Lennox Industries, Inc. Many of you know Bob, who has been part of these proceedings in the past.

"Dear Mr. McGrath:

The ASHRAE Volume, "1980 Systems," lists the expected of residential air-to-air heat pump as ten years.

The information and surveys used to arrive at that ten-year number are seriously outdated; and, the number is no longer representative of the life of today's heat pumps."

If I didn't mention it, May 3, 1983, was the date of the letter. And that was the "today" of that letter time.

"We do not have definitive information of the exact life of today's heat pumps, but the design of a modern air-to-air heat pump takes in to account the extra stresses expected in heat pump applications and we would expect a modern air-to-air heat pump to have a life similar to that of an air-cooled air conditioner of equal quality."

The last letter is one dated May 16, 1983, from Crane CAC, Inc. in Tyler, Texas. And it was written by Mr. D.E. Bronaugh, B-R-O-N-A-U-G-H.

"Dear Mr. McGrath:

We feel the heat pump life number used in Chapter 45 of ASHRAE Handbook, ten years, should be increased to reflect latest information and current products being sold. According to a survey published in Appliance Magazine (September 1981), the life expectancy of heat pumps in straight cooling systems is approximately the same (14 years for heat pumps and 13 years for cooling systems).

These numbers support our findings on industry products built and installed in the 60s and early 70s. However, there are several reasons to believe that todays heat pumps (add-on or conventional) may be better than prior products.

First, reliability is strongly influenced by the quality of the installation and maintenance procedures of the dealer. Beginning in the mid-70s, the industry began to emphasize ongoing heat pump programs aimed at upgrading the skills of those who install and service our equipment. Prior to that period, GE and Westinghouse had been the primary participants in this market.

Second, the significant redesign of heat pumps have occurred in the industry since 1978, which has upgraded the efficiency and quality of products. Such things as new compressors, new defrost components and improved heat exchanges have been introduced.

A point worthy of note concerning heat pumps, is that hermetic compressors very seldom, if ever, wear out. (And, the word wear is underlined.) The fact that

a heat pump compressor runs many more hours than a cooling system has little significance insofar as compressor failures are concerned. Compressors will occasionally "burn out" due to external causes, or possibly an internal defect in the windings or the cabinet or outdoor foil may eventually corrode. Neither of these is directly related to hours of operation.

In short, the life of 15 years may more accurately project an average life of today's heat pump and cooling systems for the purpose of life cycle cost analysis.

Sincerely,

D. E. Bronaugh

This, very briefly, is a final point. I would like to agree with Mr. McGuire that in the event or whether or not the Commission adopts HSPF and SEER for three-phase equipment, that is something that the members of ARI, if they so choose, can do, and presumably, would do with the adoption of those

criterion.

Thank you very much for the opportunity to speak this morning. I appreciate it.

CHAIRMAN IMBRECHT: Thank you. Are there questions for Mr. Baily? Thank you very much. Peter Miller, representing the Natural Resources Defense Council.

MR. MILLER: Good morning, Mr. Chairman, Commissioners. Thank you for the opportunity to speak before you today. I am here representing Natural Resources Defense Council. And I will make my remarks brief.

I would like to urge adoption of the revisions contained in the Presiding Member's Report for three-phase central air conditioners and for heat pumps. We find that higher standards than those recommended in the Report are fully justified, are cost effective and feasible for manufacturers. But we recommend that the Commission adopt the standards recommended in the Report for reasons of ease implementation and market equity. These new standards--these new revisions--will supplement and complement the air conditioner standards which were passed in December of '84, and, again, ensure market equity in California.

I've outlined in my remarks today--in my written comments--a number of issues that we've covered in the past. And I will just not talk about those today, and rather if you have questions, you can ask me afterwards. Two new issues that I discussed are on heating side levels and on the heat pump lifetime issue.

As for the heating side, the HSPF levels, we feel that that is an important side, of course, because of the significant energy use used by heat pumps for heating. Two approaches...one approach the staff used for determining what the proper heating side level should be is the regression analysis that they used which found an HSPF of 6.6 and 7, corresponding to the 8.9 and 9.9 SEER levels. A second approach that we carried out is to look at the fraction of models that meet the HSPF levels and try and set a similar...try and establish an HSPF level that allows the same fraction of models, meaning the SEER levels. In other words, if 35% of available models meet an 8.9 SEER level, what is the HSPF level at the same fraction meet? That analysis comes up with a 6.8 and a 7.4 HSPF level, which are significantly higher than the ones recommended through the regression analysis that the staff carried out.

Both of these approaches tend to indicate that the Committee recommended 6.6 and 6.8 are quite reasonable and conservative. And they allow manufacturers a reasonable space in which to redesign their equipment so that the heating side is not the forcing side. And at the same time, they don't allow too large of a drop in energy savings. So, we do recommend compliance. We support the Committee Report.

The second issue is the Alabama Power and Light Study and its impact on the Commission's determination of heat pump lifetimes and the role of that determination in the cost effectiveness calculation. The Alabama Power and Light Study looked at a thousand heat pumps in their service territory and found a median of 20 years, which actually corresponds to a mean age of greater than 20 years, if you assume an exponential decay. They found that all heat pumps lasted...virtually, they all lasted greater than ten years. And approximately 75% lasted more than 15 years.

The Study is being vigorously debated at the ASHRAE Conference. And we recommend it's taken with a grain of salt. First of all, because it is only corrobative evidence to finding of design life that the Commission is mandated to make. Second of all, because

it isn't completely reviewed. With that in mind, we note that the debate on the study is whether it shows lifetimes of 15, 20 or 25 years, all of which show the Committee the staff use of 15 years to be either conservative or accurate. So, we feel that 15 years is a well supported number.

In conclusion, I just want to note that this is a very important issue, of national if not international significance. In recognition of that, I have handed out a New York Times editorial from yesterday's paper, which specifically mentions the air conditioner standards and commends California as a leader in a new and appropriate means of supplying energy needs. I think that's a big step for New York to recognize California as a leader. And I think it's a sincere compliment to the Commission.

One last point and this regards the computer issue that came up. We are actually working right now with DOE. DOE has issued a proposed ruling for television sets. And we're submitting comments which do deal with the issue of whether or not that includes computer terminals; because, we feel it does have the chance for it being a significant use of energy in the future.

Thank you for the opportunity to present our comments today. And I would be happy to answer any questions.

CHAIRMAN IMBRECHT: Alright, thank you. Any questions? Thank you very much. Mr. Marshall Hunt, representing the Davis Energy Group.

MR. HUNT: Good morning. I just have a brief comment somewhat akin to Gene Varanini's comments, but relates to how does someone, such as ourselves, working with builders in a compliance business do the trade-offs that we now do, in light of the standards which have raised the efficiency required for the heat pump or the air conditioner, thereby eliminating one of the areas of trade-off. It seems to me the interaction between the Building Standards and the Appliance Standards needs to be not put off to the future, but decided somehow as a matter of this process. Because I believe that, even though it's a couple of years away, it will create confusion in the marketplace; and, we do need all the trade-offs we can get for the most cost effective response to the standards. And, at present, I don't see how that works.

CHAIRMAN IMBRECHT: Maybe you can delineate that problem for me a little more clearly, if you would, please.

MR. HUNT: Let's say I'm looking at a client that's building and just over the hill in Orinda or something, and they are trying to trade-off as to between whether they should have extra insulation in the attic, whether they should do shade screens, whether they should do under floor installation, whether they should do high efficiency equipment. If the Standard--the Appliance Standards suddenly eliminate, for all practical purposes, the options of the equipment efficiency increase, which is usually the range we are talking about here, the new standards as I read them for '88, that's an increment of efficiency which is fairly cost effective, as a trade-off against other things.

So, here I'm telling this builder that: "Well, you can comply this way or this way." But suddenly if I now have to always put in a certain level of air conditioning efficiency, I have eliminated that trade-off. And necessarily, other things will come out of the house. And it could have a negative impact on peak. Now, you find a situation where you upgrade the efficiency of the air conditioning and you maybe take out installation or take away shade screen. And we might end up with a strange situation, which would still have us complying with the high efficiency

equipment as required. That may not be the most cost effective and may not even be the best for peak.

When we were looking at this with consultants to SMUD's Passive Solar Program, we at one time, had a peak requirement on all buildings who got the award, which you might have seen in the local papers. That was the most direct way we had of saying if you are going to be an award-winning house, you need to have a certain peak demand and no more, in kilowatts. So, it's really difficult to get into peak through the air conditioning standards. And I am concerned about my clients and how do we trade these things off for real people, for the builder.

CHAIRMAN IMBRECHT: Okay. I'm going to return to that in a few moments. But I appreciate that.

MR. HUNT: Thank you.

CHAIRMAN IMBRECHT: Alright, Mr. Ted Gilles, Lennox.

MR. GILLES: Thanks, Mr. Commissioner, Chairman. Dave Lewis will be handling our main presentation.

MR. LEWIS: My name is Dave Lewis. And I am Corporate Director of Product Marketing for Lennox. Our discussion, this morning, for this hearing,

pertains primarily, or I would say the most pertinent information, pertains primarily to the assumptions and conclusions that the staff has arrived at in their Staff Report. And some of the conclusions we believe, because there are some very specific mathematical errors within the charts and tables, that appear within the Staff Report, definitely cast a shadow of doubt upon the whole issue that's before us this morning.

When we look at the Staff Report and their Appendix I, we find that this particular item or this particular Appendix is a very crucial element within the whole Staff Report. Upon it hinges the cost effectiveness analysis. Appendix I is entitled the Derivation of Statewide Average Heating and Cooling Use for Heat Pumps. It's already been noted that the column entitled, "Weighting Using ARI Shipment Data" is suspect. And that's due to the fact that it's claiming to be ARI data but, in fact, is not ARI data. We have no idea where this information was gathered from. But the very fact that it says 'ARI data' and a spokesman at two hearings for ARI has mentioned that it's not ARI data. And the importance of this column is that the ARI data here or the weighting of the shipment averages keys into the heating energy use by climate zone, which

effects the weighted heating use average for the entire State of California.

Now, in the staff's comments, dated June 19, their response is that they believe it is ARI data. I would guess we would say either it is or it isn't. And if ARI clearly has said that it isn't, then we would question on what basis a new standard level could be arrived at with information that's inaccurate.

We would further delve into Appendix I in looking at the heating energy use by climate zone. One of the striking elements of this Appendix is that Sacramento is, we believe, is overly weighted to that of the other 15 climate zones within the State of California. In fact, Sacramento's demand in the weighting method that was used by the staff, weights Sacramento 47% of California's total.

When you.... If you were to look at an area such as Fresno, one could find that the annual degree days or the number of heating days in Fresno actually exceeds the heating days that are here in Sacramento. Yet, the heating energy use by climate zone weights Sacramento or clearly shows Sacramento as having more of a heating energy use than does Fresno. Yet, Sacramento is given 61% more weighting in the total heating use than Fresno. This clearly shows that this

table is suspect. Now, the information that we are using as far as saying that Fresno has greater heating use than Sacramento is not just an arbitrary figure on our part. But it's based upon the ASHRAE Fundamentals Handbook. In the ASHRAE Fundamentals Handbook, we find that Fresno has 2,611 degree days, while we find Sacramento has 2,502 days.

CHAIRMAN IMBRECHT: You wouldn't know it by living here. Excuse me. That's a coastal boy talking. Pardon me.

MR. LEWIS: We believe the important item here that we are presenting is that what this would do is, it would discriminate anyone living outside of Sacramento that purchased a heat pump that was put into place or whose efficiency was set by a new level of standard that this Commission is considering. In other words, someone living in Los Angeles or living in San Francisco would be buying a heat pump that really would not be cost effective to that person, due to the unequal weighting of Sacramento. So, as a result of Appendix I being weighted incorrectly, this carries over to Appendix J and actually carries through the entire staff document, appearing also in the effect... Its effect appears also in Table 20.

CHAIRMAN IMBRECHT: It might be useful, if it wouldn't be too disruptive for your testimony, if we can ask Mr. Pennington or Mr. Messenger, since you are raising some substantial questions about technicalities, if either of them are in a position to respond. Maybe you can take a seat next to Mr. Smith and let's try to confront this issue directly.

MR. MESSENGER: Well, just let me try to give you a perspective here. What we are talking about is the method used to weight the energy use expected for heat pumps in each one of the climate zones in California. We actually looked at three different methods. And under all methods, the standards turned out to be cost effective. We used the disputed ARI data. We used census data. And we used a compromise between the census data and the ARi data. And we used some independent weightings that came up by Mr. Wolf of the Trane Company.

Now, in each of those weighting methods, there is a variance in terms of how many, what percentage of the heat pumps in California are projected to be in Sacramento. And the variance ranges from 20% to 28%. But, no matter which one you use, whether you use 20% or 28%, it still turned out to be cost effective in all cases. In fact, the ARI case is

the most conservative case in that it derives the lowest number in terms of a baseline energy use. If we were to use, for example, census data or Trane information, we would have come up with a higher energy use, higher savings and more dollar savings to the consumer over the life cycle of the product.

I believe Dave slightly misquoted the table that you see there. The table shows that there's 28% of the heat pumps in California for Sacramento, not 47%. And if you look at the census data, it shows that the weighting used for the Sacramento pilot zone is 22%. The reason that there are so many heat pumps in Sacramento is fairly obvious. We have relatively low electricity rates here. We have a high heating and cooling load. And it's an ideal situation for heat pumps to be marketed. In fact, Sacramento represents roughly a quarter of the heat pumps going into the state.

He also made another statement that in areas besides Sacramento, it would be not cost effective. In fact, our analysis showed that in 12 out of the 15 climate zones in the State of California, it was cost effective. So, I don't understand how we came to that conclusion.

I think that's enough for now unless you would like for me to talk about degree days and models and that sort of thing.

CHAIRMAN IMBRECHT: Well, let's get a response here..

MR. LEWIS: Arriving.... First of all, the 47% is an accurate figure. The 1108.08 kWh Heating Use Weighted....

CHAIRMAN IMBRECHT: Would you give me the page number, again, you are on?

MR. LEWIS: Yes. It's Appendix I, Page 1. The figure 1108.08 is 47% of the average figure found at the bottom of that column, 2,360.

COMMISSIONER COMMONS: One second. You are ahead of me. Appendix I, Page 1?

CHAIRMAN IMBRECHT: It just says I-1 down at the bottom of the page.

COMMISSIONER COMMONS: I see. I found it. Thank you.

MR. LEWIS: Sacramento, which is shown on the fourth column over, second from the end, Heating Use Weighted kWh, 1108.08 is 47% of 2,360. My calculation is not incorrect. Secondly, again, it's being referred to as ARI data. Now, I have to believe that if there is a reason for setting the proposal as the staff and

Committee has, if there are reasons available, then surely those reasons are presented within the staff documents that are referenced within the NOPA itself. It seems odd to me and it seems like a very easy way out to make a comment that: 'We have made other runs and those runs have shown cost effectiveness.'

I think the point is that this document before us is entitled the "Derivation of Statewide Average Heating and Cooling Use for Heat Pumps." And that Appendix I continues over to Appendix J, the next sheet, which shows the statewide average energy use and projected savings. Under 8.0 SEER Baseline Use for Heating you see for both Single Package and Split System, 2,360 being used. And that's Page J-1. My reason for pointing this out is the numbers that were arrived at in Appendix I continued to Appendix J and then are referenced and are even used specifically in the other tables.

CHAIRMAN IMBRECHT: Okay. If that's your point, let's try to resolve these discrepancies in numbers. Mr. Messenger, I see Mr. Lewis' point.

MR. MESSENGER: No. Okay. I'm going to refer specifically to Page I-1. And what we are looking for is what percentage of the heat pumps is being used to weight the various predicted energy uses

to come up with a statewide average. If you would look at that, if you would look under Sacramento, the number used there is 28.2%.

CHAIRMAN IMBRECHT: Okay. I see that. But then, of course, he indicated that when you look at the heating use weighted by kilowatt hours, that's 1,108 and it would just....

MR. MESSENGER: That's not a function of the number of heat pumps or the weighting. That's a function of the fact that Sacramento happens to have more degree days than other climate zones. So, the sum of that number in Column 2 times the number in Column 3 does, in fact, come to 47% of the weighted average. But, that doesn't mean that 47% of our estimate is being affected by Sacramento.

MR. LEWIS: But, the point that we are making is Sacramento doesn't have more degree days. Secondly, the 28.2 figure, which this whole item is being multiplied by to arrive at a heating use weighted kWh, is inaccurate to begin with. Further, the 3,930 figure which is under the column entitled "Heating Energy Use by Climate Zone," is also inaccurate, based upon the amount of degree days found here, as opposed to other areas. And we referenced in our report, Fresno, as an example, having more degree days than Sacramento. And

yet, the table, itself, does not indicate that. So, there are a number of suspect items.

CHAIRMAN IMBRECHT: Mr. Messenger.

MR. MESSENGER: Okay. Let me, again, try to state this. There are three methods that we can use for weighting heat pumps. One was using data provided to us by Carrier, which Carrier told us was ARi data. We believe Carrier. We don't know to what extent Courier and ARI are communicating or not communicating. But we received the information from Carrier. We didn't just sort of make this data up as was alleged.

CHAIRMAN IMBRECHT: Mr. Messenger, I have to say quite candidly -- I mean, I think it's the only proper way to respond. I mean, if ARI disavows this as ARi data, that's, as far as I'm concerned, definitive of the issue, as to whether it's ARI data. The fact that it came through another source and is referenced, in essence, it is like hearsay testimony, frankly.

MR. MESSENGER: My understanding, and I may be wrong, is that ARI did not provide the data to the docket; thus, it's not ARI data. But, that Carrier used ARi data that it provides to its member companies to come up with this information.

MR. LEWIS: As a member company of ARI, we do not report such information to ARI. The only way ARI

could get such information is from its member companies reporting area information. There isn't such a breakdown, by city or by climate zone, as far as shipment averages.

MR. MESSENGER: For the sake of argument, let's assume the ARI data is all wrong. We also did an independent analysis based on census data which showed higher savings and higher costs.... Excuse me, higher cost effectiveness to the consumer by looking at the heat pumps that were installed in each city in the State of California. We used the ARI number because we thought it was a more accurate reflection of what the industry perceived as shipments. However, the census data (which is also available) leads to higher savings.

The second table that I point out is that heating use is not critical in this calculation. What's critical is the cooling savings because they predominate for heat pumps. We have also done a sensitivity analysis that says, let's assume that you don't even realize half of the savings. Let's assume that all of our models are incorrect and we are only going to get half of the savings that are being calculated. It is still cost effective using that. It is also cost effective if you get no heating savings as a result of these standards. So, we were confronted

with a variety of different estimates, census, ARI. We chose the most conservative one which was ARI. It lead to the lowest number of savings. And if, in fact, ARI doesn't.... If we come up with information that suggests that all the ARI data is not useful, then we simply go back to the census data or any of the TRANE's estimates.

CHARIMAN IMBRECHT: I think for purposes of the record, it should not be referred to as ARI data.

MR. MESSENGER: Okay. Excuse me, the data we....

CHAIRMAN IMBRECHT: Refer to as Carrier supplied data that is represented as being ARI. I'm curious. There are a couple of things that leaped out at me. I understood your explanation as to the weighted percentage of heat pumps in Sacramento. Why is Pasadena so high?

COMMISSIONER COMMONS: That's that whole climate zone, Mr. Chairman. It's not just Pasadena.

MR. MESSENGER: It's a high cooling load in the San Fernando Valley.

COMMISSIONER COMMONS: That's most of the San Fernando Valley and most of this San Gabriel Valley and extends south to near Orange County. That's just one city out of the climate zone.

MR. LEWIS: I guess we have to continue to respond that we cannot analyze data presented by the staff, verbally. We have to see what the staff has done. And if Appendix I is the Derivation of Statewide Average Heating and Cooling Use for Heat Pumps, we have no other way to proceed except to analyze the information that is presented within the Staff Report.

When you look at the heating energy use by climate zone, one finds that 3,930 is the number used for Sacramento. And 2,523 is used for Fresno. And that disparity does not correlate to or, actually, it does correlate to the exact opposite that's found in ASHRAE. In ASHRAE, Fresno has more heating days than Sacramento. And yet here in the staff document, Fresno is shown as having less than Sacramento.

COMMISSIONER COMMONS: Dave, let me ask you a question on that.

MR. LEWIS: There was one other, just real quick, comment. Mike made the comment that heating really didn't matter. I just want you to think about that for a moment. This is called a heat pump. I don't understand such reasoning. Heating does matter. It's part of the overall cost effectiveness analysis.

COMMISSIONER COMMONS: Let me ask you a question. The 3,930 looks high to me on the heating

side. Clearly on the cost, the cooling numbers, as Mike said, are more important. But one of the issues that is in the Presiding Member's Report is actually the level of HSPF. And this would somewhat overstate or overestimate if this number were high, the benefits from the HSPF and would tend to argue for either the Presiding Member's June 6 reduction of the HPF or even the June 12th further reduction that was argued by Carrier. And that it would tend to keep the cost down on the heating side, which you are saying that these numbers would overestimate the savings on that heating side, so we should not adopt the high HSPF numbers. That would be the direction, I think, this argument would lend itself. I'm trying to understand where you are going with this potential....

MR. LEWIS: Yeah. Where I'm going is that if the Carrier data which is labeled 'ARI Data' is, in fact, incorrect, which we believe it to be, it equally affects the cooling as the heating. We are bearing a point of information on the heating aspect. But that is part of the equation that they used to come about with a statewide average. Everything is based on that weighted ARI shipment data according to the title of the title of the column.

COMMISSIONER COMMONS: Well, but I'm looking at the number that has been in question. I look at the cooling side and it actually shows on the cooling side, Sacramento requiring less than Pasadena.

MR. LEWIS: Yeah. Okay.

COMMISSIONER COMMONS: And that's just not correct. On the heating side, I can't believe Sacramento's as high as it is.

MR. LEWIS: Let me respond a little more clearly. This particular chart does not really show how the numbers were arrived at. But what actually happens is, the "Weighting Using ARI Shipment Data" column is multipled by the heating energy use by climate zone column. And then the "Heating Use Weighted kWh" is arrived at. Also, for the cooling, the weighted information or shipment data is multipled with the cooling to arrive at cooling information. So, what we are saying is the problem with this whole Appendix is not just one-fold, but multi-fold.

MR. GILLES: That's correct, Commissioner Commons and Chairman Imbrecht. I did most of this analysis, along with the support of our scientific data processing group. And the reason we zeroed in on this is the fact that Table 20 on Page 40 is your baseline case. We don't have infinite time to continue to prove

the technical aspects of staff reports. We submitted four reports, last year, during the air conditioning hearings that time after time documented errors that came out of staff. We just don't have infinite time to go ahead into these analysis. If the baseline's wrong, we see no substantive value to proceed into other scenarios. And we contend that this baseline is totally wrong.

CHARIMAN IMBRECHT: Alright. Mr. Messenger.

MR. MESSENGER: Yes. I'd like to direct the Commission's attention to Page 42 first, in which we did a sensitivity analysis and Table 23. Basically, what that says is that if we decided that, for whatever reason, our computer models were wrong or the ARI was wrong or whatever, and we would reduce, let's say, 39 to 80 kWh in half as a baseline ease; we took that down to 1,800, and only achieved half of the savings that all the models project, would it still be cost effective? The answer is 'yes.' We did that because we wanted to be absolutely sure that no matter, under what types of uncertainties that might combine, you would still be leading to a cost effective standard. That's the first point I wanted to make.

The second point I wanted to make is that we presented this information in late April. And we asked

for technical comments at a hearing that the Committee had in May 24 -- roughly a month ago. None of this information that Lennox is bringing before you now was brought up. Their tactic is to bring in information on the last day and attempt to discredit analysis without actually providing specific information. This is a consistent tactic that has been used. And it is not helpful to the Committee nor the Commission, in my opinion.

MR. LEWIS: Probably....

MR. MESSENGER: The second.... Could I finish?

CHARIMAN IMBRECHT: Mr. Messenger, it's not your position to be offering that kind of an opinion at this hearing.

MR. MESSENGER: Okay.

MR. GILLES: Agreed.

MR. MESSENGER: I'm sorry. I beg you apology. Excuse me.

MR. LEWIS: Probably, if I was sitting in his position, I probably would say the same thing. But let's look at the facts. We received this document on May 14; and, there was a hearing. I think it as May 24. Is that correct?

COMMISSIONER NOTEWARE: Yes, I believe it was.

MR. LEWIS: There was not adequate time to go through all the items that are contained in the Report, adequately, in that period of time. We don't have the resources for people to sit there and crank on the computer to find out even...since the information is not explained even as to how its arrived. Look at Page 42 for an example. On what basis...? They are nice tables; but, what is the background for the tables? Where does the information come from? We surely can't sit down and assume that this information is accurate if the baseline case.... At least we can't automatically say it's accurate without testing, if the baseline case, itself, is inaccurate.

This is not a delaying tactic. It's not a tactic of coming in the last hour. Actually, when you take a look at the way we have receive information, specifically on this rulemaking and the time restraints, I think we have done very well to come up with the information that we have presented. And we are doing it in a sincere way, as we did throughout the air conditioning hearing.

MR. MESSENGER: Mr. Chairman, if I might?

CHARIMAN IMBRECHT: The last one, then we are going to take a luncheon recess.

MR. MESSENGER: Okay. Mr. Lewis raised a rhetorical question of where the information, in terms of how it came to our analysis, is available. Basically, Pages 15 through 25 lay out, in great detail, how we came to our analysis. And, in particular, we discuss the weighting method used in terms of both the ARI and the census data on Pages, basically, 15 through...all the way through 30. So, we think the information is in the record now.

MR. LEWIS: No.

MR. GILLES: Our total statement, Mr. Chairman....

CHARIMAN IMBRECHT: I'm going to let you go ahead and finish your statement.

MR. GILLES: Okay. Our total statement, that is quite extensive, goes into many more errors and how we found them. We found them.... By computer iterations is how we found the errors; because, we knew the answers weren't corect. And we go into that in the whole statement. And it's a complex issue. But, we are sorry that we end up in this continual adversary situation. We honestly do. I personally do; because, it gets tough between Mr. Messenger and myself. But I

think Commissioner Commons can attest to the fact that, during the proceedings last year, the staff knew we checked these numbers. So, when they put out something, they realized they are going to get checked.

COMMISSIONER COMMONS: I'll attest to that.

MR. GILLES: Alright. Thank you, sir.

MR. LEWIS: I think also we haven't withheld any information.

CHARIMAN IMBRECHT: Let me ask you: Do you have a bottom line?

MR. LEWIS: Well, that's only one item.

CHARIMAN IMBRECHT: I understand. Well, why don't you go ahead and complete your testimony. Do you have anything else to add?

MR. LEWIS: Yes. Table 20 will be next. Table 20.... Well, let's actually go to Table....

COMMISSIONER COMMONS: One second. We are going to drop that topic. I want to see if we can pull it together before you leave that topic, if you don't mind.

CHARIMAN IMBRECHT: Alright. Fine. If you've got a question, go ahead.

COMMISSIONER COMMONS: Dave, If I follow through on what you are saying: if Sacramento were roughly the same as Fresno, that would be on the

heating side. That would be about a 40% reduction in the heating. That would reduce the.... Then you would have to reduce the 1,108 by 40% -- the heating portion, which would be about a 440 reduction which is an overall net reduction on the heating side of approximately 20%. And you would then have to go next to Appendix J and you would have to reduce the heating kilowatt hours by roughly 20% on both of those, in terms of your cost effectiveness analysis, if your statements were correct. That would be the appropriate correction to make.

MR. LEWIS: Well....

COMMISSIONER COMMONS: Then you would have to analyze based on that change.

MR. LEWIS: I would really enjoy it being so simple; but, it's not. The biggest problem is that, during the May hearing, the column entitled "ARI Data" was identified as being in error. And any number on the other columns that arrive at conclusions are multiplied by that ARI shipment data. So, whatever errors are contained with that shipment data, is multiplied in its inaccuracy when it gets factored with the cooling and heating days.

COMMISSIONER COMMONS: I'm just trying to....

MR. LEWIS: I know you're saying the heating data....

COMMISSIONER COMMONS: I'm not saying you are incorrect on your other statement or dropping it. I was just trying to follow through on that one that stands out.

MR. LEWIS: But, we.... That stands out because it is the most dramatic. However, when you look at the other data from the other climate zones, you don't arrive at.... You are not comfortable saying that the information here is representative of any climate zone. I mean, like Pasadena, personally, I mean, we can say as much as we want about how it meanders through many mountains and hills; yet still, that number does not look accurate to us. Mt. Shasta does not look accurate to us. Eureka does not look practical to us.

COMMISSIONER COMMONS: Okay. But, the one thing on that column is if you drop Pasadena to 20, you would have to increase something else by that same percentage.

MR. LEWIS: Yeah. But we're....

COMMISSIONER COMMONS: It still has to add up to 100.

MR. LEWIS: I guess I don't where such a discussion will actually lead to; because, I don't think there is any easy answer to the problem that we've presented. I think it is going to demand some time and analysis to correct. And until it's corrected, there really isn't any way of going further.

COMMISSIONER COMMONS: Alright. One last question, then. On the ARI shipment data which we are now saying is not ARI shipment data, do you have any data that you can provide us which would actually show what you think is correct?

MR. LEWIS: Here's our difficulty. We do not have any tracking method; nor, am I aware of any other manufacturer. There may be some manufacturers. I would say the majority of manufacturers do not have a tracking method that allows them to pinpoint what climate zone a unit ends up in. We are just not at that point in our distribution and cycle that we can....

COMMISSIONER COMMONS: But, then if we gave additional time to try to resolve it, time wouldn't help us. We still would not get that information?

MR. LEWIS: That is correct. We would certainly be willing to provide some information. I mean, I don't want to be giving the attitude like

here's a problem and we don't have anything to solve it, but we're willing to supply information that we do have available. It probably wouldn't be broken down to the degree of each 16 climate zones, because that kind of tracking is nearly impossible. But, census data though, as far as where the population is within the state, that is readily avaialable.

CHARIMAN IMBRECHT: Well, obviously, you've got some other points to make. I think we ought to take a luncheon recess until 1:30. I hope that's not too much disruption to interrupt your testimony. We'll come back at 1:30, let you complete your testimony, take the remainder of the witnesses, and then turn to Commission discussion. Thank you.

(Whereupon the morning session of the Business Meeting of the California Energy Resources Conservation and Development Commmission was adjourned for a luncheon recess at 12:30 PM.)

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AFTERNOON SESSION

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CHARIMAN IMBRECHT: Okay. We'll call the meeting back to order. If you would like to continue your presentation. Thank you for your patience. We're all ears.

MR. LEWIS: We would continue, then, as far as our Report goes, on Page 4. Page 4 begins the review of Tables 20 and 17. Within the Report, Table 20 is on Page 40 and Table 17 is on Page 36. Table 17 reports the staff's findings of the Weighted Incremental Cost for equipment as the standard would affect it. In other words, the incremental cost increase by going to a higher efficiency level, based from the 8.0 level. Now, it should be noted, I'm sure you are aware that in Table 17, the single package value of 103 under 8 to 9 SEER was changed by errata to read 159.

As we analyzed these numbers -- now I'm continuing on Page 5 of my report -- when we analyze these numbers, we, first of all, just made a comment there under.... We turn to Table 17 and we put an asterisk by the corrected number of 159. Later on in the report, we show how 159, in reality, should be 195. In parenthesis beside each value, listed 1(a), 2(a),

3(a), and 4(a), which correspond to the four points beneath in the report.

1(a) is obviously an incorrect value; because, the numbers that were picked up from the ARI submitted data, which appears in Appendix P, Page 1, are different from what the numbers were evidently used to bring about the conclusion of 199. For your convenience, we have, on Page 6 at the bottom, shown a corrected incremental cost table, using the staff's procedures but used numbers that were, in their mind, correct numbers to be employed, rather than using numbers from wrong tables, as was done. Nowhere in the document does it actually show how one arrives at their reported $199 figure for the split system going 8 to 9. But we have, through some computer work, determined the way that was found was by taking Carrier's information that they control 22% of the marketplace, and multiplied their cost increase (which is $121) by that .22 factor, which would mean that .78 of the marketplace is not Carrier's. And what the staff did is, from the ARI number showing in Appendix P, they extracted wrong, incorrect information.

Now, the reason why we would spend time with this is because one of the key factors in a cost effective analysis is what is the weighted incremental

cost to go from the baseline that exists today at 8 to the new level that is proposed. And then, actually, since they are proposing two standards, the correct method to proceed would be to show the cost effectiveness on the 8 to 9 level and then show a 9 to 10 level, which was never done. But actually, what they did instead was to take from an 8 to 9 level and then an 8 to 10 level.

Well, be that as it may, even though that's incorrect, the numbers that they show on Page 36 and Table 17 are all inaccurate. I don't think that time really...it would help us to go through each item, unless specifically I would be requested to. It's all written there. Each item is inaccurately computed. Therefore, the weighted incremental cost in 1984 dollars for a 2½ ton unit is inaccurate throughout. We think this is very important; because, that has much to do with whether it is, as the statute requires, cost effective to the consumer.

The errors, I believe, really illustrate the lack of credibility contained throughout the Staff Report. The information that they... They provided information.... Carrier provided information on going -- Carrier is on Page 31. Carrier provided incremental price information. They did not show information going

from 9 to 10 in either single package or split system. And neither showed the cost of going from 8 to 10 for a single package as they did for a split system on Page 31. So, in every case for Table 17, which is really at the heart of the issue, they did use the correct Carrier number or value. But, in every case, they used the wrong information on the ARI submitted information, which appears in Appendix P.

Should I just continue? Or how do...?

MR. RAUH: I could venture a brief comment.

CHAIRMAN IMBRECHT: Sure, I think probably we ought to take this in serial fashion -- take your statements from the staff.

MR. RAUH: First of all, the Staff Report was begun and the tables that have been referred to or constructed with an original ARI submittal of cost data. And, the staff had completed its analysis at that time, when we received a second submittal from ARI, which I believe is being referred to now as the correct ARI costing data. On Page 43, Table 25 and Table 26, the staff constructed a sensitivity analysis with just the ARI revised data. And one sees both the net savings impact change as a result of changing the values. Basically, you can see from the sensitivity analysis, that without including the proportion of

Carrier weighted sales in the state, as was done in the staff's base case, the standards, just on ARI's revised submittal data, are cost effective.

So, despite the references to earlier tables that were constructed during the proceeding with the original ARI submittal, staff recognized it could not turn all those tables around in the timeframe of this proceeding. But, did take the industry's new submittal of information and did run additional sensitivities. Because of the overwhelming cost effectiveness of the improvement and efficiency, relying only on ARI's additional submittal of data, the standards are still cost effective. And that's what Tables 26 and 25 display.

MR. LEWIS: Our comments to that are very simple. If a person was to say we were going to go hunting and we took a gun and went out into the area to do our hunting and didn't know what we were hunting, it would be very difficult to know what we would come back with. If when we got out there and found that we were hunting for birds and actually elephants approached, we'd find out that we had the wrong ammunition.

The baseline information is that which is found on Table 17 and is that which was found in Appendix P and is that which is found in Table 20.

Further, Ted's argument, though sounding very good, has two basic flaws. One is that the information submitted by ARI -- the correct information that was submitted by ARI -- was provided on March 27th. This report arrived to us, or in fact, the very page that I am looking at, is dated April 30th.

Now, the comment was there wasn't enough time to go back through the tables and correct them. We disagree with that; because, when you look at staff's Figure 8 and 9, they did correct the numbers, according to Appendix P and did not use Table 14 and 15, that Ted Rauh referred to. So, in other words, they used certain information on certain tables and other information on other tables and incorrect information on many tables. If there is a baseline that we are looking at, then that needs to be cost effective. And if that baseline is in error and flawed, then we question cost effectiveness; because, cost effectiveness hasn't been shown.

The sensitivity analyses that are referred to have no data to substantiate their findings. In other words, there isn't any way to go back and reconstruct each and every sensitivity analysis that was made. We believe that the right approach was to look at their baseline data. And if that is suspect, surely, it

would be easy to conclude that at least the sensitivity data would be suspect, when you look at the type of work that was actually gone into the Staff Report.

MR. RAUH: I would just briefly refer the Commission to Page 32 of the Staff Report, which outlines the history of the acquisition of ARI data and also indicates where it came in stream for the Report, the fact that we did have to have some communications with ARI about its data, and the differences between its earlier submittal, and the fact that we, at that point, indicated we would do a complete sensitivity with the revised ARI submittal, which we have done. And as I indicated on the tables I referenced earlier, on that data alone, the proposed Committee action is still cost effective.

MR. LEWIS: But, the statutory requirement is that it's cost effective to the consumer. And, that cost effective analysis must be shown. I mean, it must be verifiable. And what we have attempted to do is go back and verify the numbers that staff used. Why is it that the staff would include, on Page 30a and 30b, information that they knew was inaccurate when Appendix P, dated 3/27, clearly is noted as corrected information.

A letter went out from ARI because of the problem that, I guess, in some transmittal of information before everyone understood what was being transmitted. ARI responsively went back and sent a letter to the staff in plenty of time to be included in an April 30 document to correct the inconsistencies. I'd further mention, why was the figures...? Why do the figures...? Why were they corrected -- Figures 8 and 9? And yet, Tables 17 and 20, which is the baseline, they were not corrected? I don't think we have a pick and choose issue here.

MR. RAUH: Well, I think that the inclusion of the ARI original submittal provides an additional fullness to the record. And at the time the staff analysis was being done, staff felt that there was validity in the original submittal that ARI had made, the revised submittal. There were continuing dicsussions about whether that was...the revisions and why the revisions were made to their data. I don't see any damage to the proceeding by including both sets of data in the report, demonstrating an analysis on both sets of data. As I pointed out, it has been the interest of the Commission, in the past, to have a wide number of sensitivities presented to you, using various discount rates, various cost assumptions, and design

lifes. We have done this in this proceeding, in this report, consistent with the kind of analysis we presented in earlier standards proceedings to show you the variations that are caused by changing some of these parameters.

In this case, costs by the industry, alone, which is not the staff's recommended set of baseline numbers, we still recommend the set of numbers or a set of numbers that has a weighted average on both submittals of information. Basically, it still shows that the standards are cost effective by a wide margin. And I think that by reading the document, one can clearly deduce what staff did all through this proceeding in dealing with the issue of cost. I don't find it confusing.

MR. LEWIS: I would ask that everyone look at Page 36 and the title of Table 17. The numbers that are reported there, each and every one of them, even the errata sheet that was sent out in June to correct this information, was still in error. The point is that if there is an error here in the baseline assumptions, there is no excuse to put out a document that affects the consumer and manufacturers, such as ourselves, to this degree, and there be inaccuracies in it. And any conclusions arrived at by the staff and

Committee, based upon this document, and the baseline study... Well, I just... I really feel like the issue is presented very clearly.

The baseline is wrong, the numbers are wrong. Table 17 is not just ARI data, as was just mentioned by Ted. It is weighted information, including Carrier and the ARI submitted information. It's weighted. It's not just one manufacturer's information. It's not just ARI's information. And those are the baseline numbers that occur throughout this entire Staff Report, just as we pointed out.

CHARIMAN IMBRECHT: What accounted for the change in the ARI submittals?

MR. LEWIS: Well, I'm not ARI. But I can say this. The information that we submitted to ARI around the 1st of January, per the Commission's request, is included in Appendix P. We don't know, not being ARI. We do not know where Table 14 and 15 came from. But it should be noted that even the incorrect -- Tables 14 and 15 -- a letter was written. It's docketed; and, the correction was clearly made in a sufficient amount of time for any changes that were necessary to be made, to be picked up. Further, when the changes were made, they only picked it up on some of the tables and figures, not all of them. They selectively used the

correct numbers and selectively used the incorrect numbers.

CHARIMAN IMBRECHT: I'm not sure I'm willing to accept that allegation, at this point. Commissioner Commons?

COMMISSIONER COMMONS: Dave, two questions. First of all, you've identified the errors. Have you made computations based on your best estimate of what is your correct data as to what the appropriate numbers ought to be?

MR. LEWIS: Well, because of the timeframe, to be very honest, we were working into the wee hours of the morning, even to conclude this document. We have not had time to go back. And, you know, I'm not sure that, really, it's our responsibility to go back and correct each and every number. We just barely had enough time to compile this information, based on the time requirements that we have had to work under.

COMMISSIONER COMMONS: But, in case you had done so, I was hoping we could have the benefit of that work.

MR. LEWIS: The corrected, though, information.... Now, we don't agree with Table 17, even when its corrected, mind you.

COMMISSIONER COMMONS: I understand that.

MR. LEWIS: But that's aside from the issue. Table 17 is is corrected for your review. Top of Page 5 is the information that is in the staff document with the May 17th errata sheet, showing the 159 figure change. And Page 6, at the bottom, are the corrected numbers. Some of them, we believe, are quite substantial. In fact, I'm sure you'd agree.

COMMISSIONER COMMONS: Let me ask this. You've looked at what you are saying is are errors. Do you think they would change positive numbers to negative numbers? Or do they only go to the extent of cost effectiveness? Do you have an opinion on that?

MR. LEWIS: Well, I think it would change it dramatically. If you look at Item 4 on Page 6, the only way, consistently, that you can arrive at the Carrier number, when the number documented from Appendix P is used correctly, would be the Carrier's price would actually drop $116.55, so that it would fit within the weighted cost figure. I think it would change it quite dramatically. I don't know of any product that could change going from 8 to 10 and then drop to $116.55 because an efficiency increase was incurred. That doesn't....

COMMISSIONER COMMONS: Let me ask you....

MR. LEWIS: Yes. The change is important.

MR. RAUH: Could I just bring one set of numbers to yh our attention? If you look at Table 17, where we indicate the weighted incremental cost would be $199 and you look at their estimate, using the ARI data on Page 6, of $207, we are talking about that difference in the cost. We have already indicated a large benefit stream. And therefore, it's still going to be cost effective with their number. So....

MR. LEWIS: Why don't you compare the other numbers in the table also?

COMMISSIONER COMMONS: The big difference is on the single package.

MR. LEWIS: 159 to 195?

MR. RAUL: That's right.

MR. LEWIS: 471 compared to 520? 394 compared to $463, including Carrier's number for that upper standard, actually causing their equipment to lower in price by $116, from what's currently on the marketplace.

COMMISSIONER COMMONS: Let me ask you another broad question. I don't know if you want to answer it or Ted. When you look at a heat pump, is there any reason to believe that a heat pump from a cost effectiveness standpoint on SER would not have at least

equal, if not greater benefits because of the heat side as compared to a central air conditioner?

MR. LEWIS: Well, that's a completely different issue. We do cover that in our report. We can launch into that if we are through with this issue. I'm happy to respond.

COMMISSIONER COMMONS: I don't want to jump ahead. So, I'll hold that question.

MR. RAUH: I might just make one final comment. Mr. Messenger has indicated to me that the values for split system and single package shown on the bottom of Page 6 of their testimony -- the 7,195, 520 and 463 were used by staff in its sensitivity analysis, which are presented in the Staff Report. So, we have looked at those runs and have determined that the standards are cost effective.

MR. LEWIS: That really does not lay at the heart of the issue. The point, as we see it, is that the analysis that has been done, here in Table 17, four out of four are incorrect.

CHARIMAN IMBRECHT: Question, though, I mean, are they incorrect to a degree to render the final judgment inaccurate? You tell us that....

MR. LEWIS: Chairman, definitely....

CHAIRMAN IMBRECHT: ...you are not in a position to offer your perspective on that.

MR. LEWIS: Chairman, definitely, they would cause a very dramatic effect. I think it would completely mislead the outcome. Using these numbers would mislead the outcome. The worst case example, and it's easiest to use; because, it demonstrates the issue. And that is when you have a product -- let's say you have a product that moves a 2½ ton package unit, that moves from 8 to 10 in efficiency due to new design. And then in that move, the product price decreases $116. That's a dramatic effect and dramatically incorrect. Not only based on the testimony of this current heat pump ruling, but through this last year and a half. I am sure Commissioner Commons can mention that there has never been anything reported from any manufacturer that prices would decrease by going up in efficiency. It doesn't stand to reason. So, the effect would be pronounced. Basically, it would completely obliterate any kind of price increase and actually would roll back numbers. It doesn't hold.

MR. RAUH: On Page 43, the Revised Cost Estimate Net Savings for Table 26 which is utilizing the numbers that are presented, we show the net savings

benefit being $156 and $133. So that is the specific table in which we utilized the ARI cost data.

MR. LEWIS: Where did those numbers appear anywhere else in this document? Derivation-wise. They don't appear. There isn't even.... In fact, from Page....

MR. RAUH: They are derived with the methodology that is described in the Report and the ARI cost. That's the only change....

MR. LEWIS: The methodology is not described in the Report. That's part of our argument.

MR. RAUH: Well, we just have a disagreement there in terms of the material preceding this that describes how we came up with cost numbers, how we did the evaluation and so forth.

MR. LEWIS: Point it out. It's not there, Ted.

COMMISSIONER COMMONS: Mr. Chairman?

CHAIRMAN IMBRECHT: Commissioner Common.

COMMISSIONER COMMONS: Let me just make sure I'm following the same line of questioning that you are. My understanding.... Assuming their numbers would be correct, that you would have to make the following adjustments on that table, as you would adjust downwardly the split system by 8 and $49 and the

package systems by 36 and 68. I want to see if that's correct. What I'm trying to do is go back and see if we can answer the question....

CHAIRMAN IMBRECHT: Fundamental question. Right.

COMMISSIONER COMMONS: Does it affect the outcome? Or does it affect the.... Is it more affected by $400 or $200? Using the numbers that you were just giving, the numbers I come up with on the split system should be reduced by 8 and $49. And on the package....

MR. LEWIS: Do you mean increased?

COMMISSIONER COMMONS: Yeah. The cost should be increased on the 8 to 9 SEER for the split by $8, on the 8 to 10 by $49, and on the package by $36 and by $68.

MR. LEWIS: It should be pointed out that the $463 value.... Okay.

COMMISSIONER COMMONS: The second error that was identified, which staff.... Recognize what I'm saying that this is an error, I guess I should probably use the statement alleged error, was on the SMUD heating, which we calculated was roughly equivalent to 20% of the net benefits on the heating. And then there is an issue that's been raised as to whether or not

there has been the appropriate allocation from Pasadena, from Sacramento and from each of the areas as to the incidents of heat pumps. But, everyone agree that we have no better data than that which we have. It just doesn't seem....

MR. LEWIS: No, we didn't agree to that.

COMMISSIONER COMMONS: It doesn't correspond with your own belief; but, we have no other data that we can present to make an assessment. I'm just trying to see.... I'm trying to add up the different things; because, you might have one thing at 20 and another at 40. You add them all up and it might change the outcome; so I am trying to put them all together into....

CHAIRMAN IMBRECHT: I understand that. I appreciate that.

MR. RAUH: While they are discussing, perhaps I can bring one more fact to bear on the Sacramento data point that is being contended here, actually several points.

First of all, we derived those values by using the state-of-the-art computer program that takes into account climate conditions, weather tape, etc. -- the same computer program we establish building standards with. Then we modeled a particular home, a

particular home size in each of the 15 regions. We came up with those numbers, the numbers that are being compared to ASHRAE degree days. ASHRAE degree day method is a much less sophisticated method that is not used in establishing performance based standards in California. We have moved, over the last seven years, to computer modeling, computer simulation, and as the Commission is quite aware, we have our own public domain computer programs that have gone through extensive building industry scrutiny, where there are accuracy and predictability of actual conditions.

MR. GILLES: Mr. Chairman, we....

MR. RAUL: Let me finish, please; because, that's not the only point I wanted to make.

MR. GILLES: Alright.

MR. RAUH: Secondly, SMUD documented an actual metered study of heat pump energy use in Sacramento. That study came out in excess of the number that our computer model predicted, by well over 200 kWh per yer for heating. That's an actual meter data study that corroborates the general finding or the modeling finding of our computer analysis. So, basically, we think those are important facts to bring forward about the relevant accuracy of degree day

method versus computer simulation and the actual meter data study that verifies that number in Sacramento.

MR. GILLES: I couldn't agree more, Mr. Chairman. We cross-checked it also. We used Air Force 30-year baseline data on temperature frequencies for both Fresno and Sacramento to make sure that we were on relatively solid ground in the time we had available. We did not use DOE 2.1(b) because of the time involved and the time we had to work on it. But, an examination of the Air Force 30-year temperature frequencies for Fresno and Sacramento will show the verification of the degree days that are a standard part of ASHRAE and had been there for years in the guide. And we did do a bin check on the heating loads; and, they are just totally wrong. On Table V-8, for the 1400 sq. ft. houses, you are using $28,441,000 for Sacramento; and you are using $17,618,000 for the same house in Fresno. It just doesn't make sense.

MR. LEWIS: I think we can make a further comment. I don't mean to boast; but, I believe Lennox also has state-of-the-art computers. And I think our people are also competent in operating them. I don't think that is even an issue. What's really at issue here is: What information was used? The information that was used was inaccurate. I guess the best way to

show its accuracy, I don't know the best way, but a way of showing the inaccuracies, we are not merely arguing. And I know we have diverted back now to our original discussion in Appendix I. Our whole premise is that the heating information is suspect as we believe the cooling information is suspect. But, that number is multiplied by another number. That number is also suspect. Those numbers also end up being used, not in just one case showing an example, but is the very part and parcel or the very framework of the staff document. Table 20, Table 17, Appendix I, Appendix J, going through the entire book, the point is they have shown cost effectiveness on a baseline case. And there are errors, whether we call them alleged or not, there isn't any way to be able to duplicate them.

CHARIMAN IMBRECHT: The question is: Are they errors of such magnitude as to change the ultimate conclusions? I'll just say to you in response -- and I think that most people in this room know my attitude about these overall subjects -- but I have to say, as well, that (and I've never hestitated in expressing this) I don't frankly that the industries demonstrated any particular superb track record in terms of submission of information and data, etc., analysis as well that contrasts in any dramatic fashion with that

which is being held up against staff here at the Energy Commission. That's not the statement that, frankly, is one that I want to have debated. That's my own personal judgment.

And I might say, as well, that as has been the case in many of these dicsussions, I think we have seen an increased degree of cooperation. But, there also has obviously been a fair degree of reticence, sometimes justified, but in some cases, clearly with an overriding or a phrase used this morning -- "tactical consideration, as well, in terms of submitting information to the Commission.

What I want to get to, and this debate's gone on long enough as far as I'm concerned, in terms of back and forth on tables. I don't find that weighted incremental costs that you show in your document versus that which is in the staff document, the differences that to be of such magnitude that they jump out at me as suggesting that the ultimate conclusion is going to be in error. So, what I want to find out is, in essence, what Commissioner Commons was asking, as well. These differences of $40 or $50 are not dramatic. And unless you can demonstrate.... I want to see some demonstration of how that's going to translate over into reversing, in essence, the fundamental conclusion

that at least a first tier, which is the one that I am personally focused on, as I have also frequently expressed by viewpoint about setting tiers out in the future, that they are not, in fact, cost effective.

MR. GILLES: Mr. Chairman, since I did most of our economic assessment, I'll pinch hit here for Dave for this time at bat. What.... The key issue that we hold with eminence here is the fact that there are identified, we think, errors on both sides of the critical life cycle cost effectiveness equation. We're seeing what you're asking and Commissioner Comons is asking, that there is identifiable, apparent true variation on one side in terms of the differential first costs. What we are saying on the other side of the equation, as shown in the results in Table 20, related to the energy savings, is also in error; and, we honestly don't know the magnitude of that error. So, we can't say, out of hand, that yeah, there's not much error over here, so it's still going to wash okay over here. Because there is an error on the other side of the equation.There are errors, we believe, on both sides of that critical equation.

COMMISSIONER COMMONS: I don't understand -- excuse me for interrupting, Mr. Chairman -- the air on the cooling side. I have not, yet, understood.

MR. LEWIS: The two sides are first cost offsetting savings. That's the equation and that's what's required in the statute. For cost effectiveness to the consumer, the savings needs to offset first costs.

COMMISSIONER COMMONS: But the only errors I've heard are the heating error where we have a specific number and the cost error where we have specific numbers.

MR. LEWIS: ...and, the factor that the cooling data is multipled by creating a cooling error and their cost numbers, which would be the same.

COMMISSIONER COMMONS: We don't know the direction.... If there were an error, we don't know othe direction of that error. If that would increase or decrease and you have no evidence to present to us, other than your opinion, as to whether or not that is correct. I don't know what evidence we have better to rely than the evidence that's been submitted on staff on this. It may increase or decrease it; I don't know.

MR. LEWIS: That's a true observation. The only thing is that we know, also, that the information presented there, in that table, is also inaccurate. So, we can't base it on some inaccurate data either.

COMMISSIONER COMMONS: Alright, let me give you the sum of the two numbers, because I have calculated that -- first for the 8 to 9 standard or the first step. For the split system, the sum would be $35--that's $8 on the cost side plus $27 on the heating side. And that's just assuming the alleged error on the SMUD and making that adjustment. On the single package, it would be a total of $88, including $52 on the heating. And on the second step, $30...a total of $82 on the split system, which would include $33 on the heating and $130 on the single package, which would include $62 on the heating. Those would be the sums of the two numbers that we've heard. Now, how that compares to the benefits, I would assume the staff has that. So, in short summary, on the first tier a single split system would be $35 and a single package $88.

MR. LEWIS: I guess there are two points, then, that we would comment on. First of all, since there are various sensitivity studies, it seems like what happens is if one becomes faulty, there's a reliance on another. All information that proves or builds the case of cost effectiveness must be available. And up to this point, all the information on all the various sensitivity analysis have not been provided; so, it is impossible for us to make a good

solid statement that we could really rely on as far as the effectiveness of the other items.

COMMISSIONER COMMONS: What I'm trying to do, Dave, is find out if I have to go the merits of whether or not there was an error or to say the error does or does not affet the final judgment. If the error turns out not to be so substantial that it would affect the outcome, whether or not it's an error not, I'm not going to formulate an opinion.

MR. LEWIS: But the point is that the NOPA is based upon the findings of the staff contained in the Staff Report and Committee Report. Outside....

COMMISSIONER COMMONS: The judgment of the Commission today is going to be based on the information that's presented in the Committee Report and the evidence that we hear today. I'm not asking these questions because I was a member of the Commitee. I am asking these questions because I am interested; and, I want to make sure that the judgment that I am eventually asked to make is proper. So, I'm listening to the testimony.

MR. LEWIS: Well then, could all the sensitivity data, then, be provided? I guess that would be our request.

MR. GILLES: Well, first of all, the baseline data's got to be correct.

MR. LEWIS: Well, he's....

COMMISSIONER COMMONS: I'm mainly concerned with the baseline data. I can make a judgment on the sensitivity cases; but, I want to make sure I have an understanding of that baseline data.

MR. LEWIS: Well, if the baseline data is inaccurate and we don't have any way to conclude one side of the equation, that being the amount of weighted use that is averaged for the State, then even if the incremental price increases were correct, still you don't have justifiable grounds on which to raise the standards.

COMMISSIONER COMMONS: Maybe there are other parties, Dave, and yourself who can give us better information. But, I'm sure the staff has asked for information on this; and, this is the best evidence that they have available to give to us. I've heard no information to say something should be something other than what it is, except questions being raised as to the appropriateness. For all I know, it might be higher or it might be lower.

MR. LEWIS: The reason why we argue with the direction that this is taking is....

COMMISSIONER COMMONS: Actually, I think the SMUD number here on the waiting seems a little low compared to my own thoughts in terms of heat pump allocation.

MR. LEWIS: We believe the...specifically, your shipment information and the way that's weighted throughout the State of California, to arrive at an average. I don't think that the statute would allow.... Let me take it from another direction. I believe that you have to look at the populus within the State of California. Anybody within the State of California can purchase a heat pump. I think it needs to be weighted the fairest way for it to be weighted is by population. And if were weighted by population (which there is good information, solid census information on that), I think that would be the most logical way to proceed to show that there's cost effectiveness on average to the consumer within the State of California that may purchase a heat pump system.

COMMISSIONER COMONS: Well, I wouldn't accept that; because, that might make a bias for or against the standard because people buy heat pumps based on the gas versus electric rate. And so, you may be justifying a standard because of the population density

in areas where people don't even buy heat pumps because it's not in their interest to do so. You've got to get into the economics of the utilities.

MR. LEWIS: Commissioner, you've made the point that we haven't come up with anything. We believe that we have just provided a suggestion.

COMMISSIONER COMMONS: Okay.

MR. LEWIS: And the suggestion is that since the consumer that's spoken of in 25402(c) is a California citizen living, dwelling anywhere within the state, that the cost effectiveness on average, should be to any person wherever they reside. It shouldn't be biased by where they live. That's a suggestion.

CHARIMAN IMBRECHT: Is that your conclusion that we have to find cost effectiveness for every citizen in California? Is that what you are saying?

MR. LEWIS: I'm saying that, on average, a citizen living within the State of California. The average citizen in the State of California that purchases a heat pump, it should be the standard that is regulating that industry--should produce a heat pump that's cost effective for that average California citizen.

CHARIMAN IMBRECHT: For that 'average' California citizen?

MR. LEWIS: No matter where they reside.

COMMISSIONER COMMONS: In other words, Sacramento would have 128, having roughly 128th of the population. You'd weigh it 128 rather than 28%. Then, you would take Los Angeles and you'd weigh the county at 25% rather than what shows up here at 8 or 10 percent. This weights it more in terms of the staff's best estimate as where heat pumps are sold. They are suggesting--as a cross-check, it's certainly not a bad idea.

MR. LEWIS: I guess one further issue that somehow has alluded us and that is two standards are being set here. The cost effectiveness only is really shown for one standard. The second standard has never been addressed. And that is, the cost effectiveness that needs to be shown for a person buying that product where the product available is already at that first standard level. Then, the cost effectiveness should be based upon, from that new level, to the second level. Instead, the way it's been going is the analysis has been done from 8 to 9 and then 8 to 10. It should be done from 8 to 9 and 9 to 10, or 8 to 8.9 and 8.9 to 9.9, specifically.

COMMISSIONE COMMONS: I have one other technical question on the cost, since we are talking

about errors. Bill, was the costing done on the original NOPA or on the Committee recommendation, on the HSPF?

MR. PENNINGTON: It was done on the original NOPA.

COMMISSIONER COMMONS: If we dropped and we weren't to adopt the original NOPA, and were to adopt the Committee's recommendation on the HSPF, that would tend to reduce the cost of implementing this.

MR. PENNINGTON: One would suspect that. Yes.

COMMISSIONER COMMONS: It might vary from manufacturer to another. I believe that's what Carrier testified, Bill.

MR. PENNINGTON: That could be.

MR. GILLES: Mr. Chairman, there has been a lot of rhetoric here in the last few minutes.

CHARIMAN IMBRECHT: Yeah. There certainly has.

MR. GILLES: I repeat that Table 20 is critical to this whole procedure and in our best conscious, feel there are unidentified errors on both sides of that critical equation. There are errors on the present value of the savings from one source or another. There are errors on the first cost

differential. And it is difficult for me, personally as a professinal engineer, to see how the Commission can proceed to adopt anything based on a baseline situation that is known to have errors in all the critical elements.

CHARIMAN IMBRECHT: Okay.

COMMISSIONER COMMONS: I have one other comment. I'm sorry. The suggestion that they make on a population basis might have methodological problems because of the climate zones. The climate zones cross counties; and, it's not as simple a calculation as we might suspect originally.

CHARIMAN IMBRECHT: Okay, why don't you complete your presentation? I think we need to move it along here.

MR. LEWIS: On Page 7, the section regarding Equipment Turnovers. I extracted two quotes from the Staff's Report found on Page 22 and 43, both of which report that there is a roughly 10% normal turnover per year. Page 43 actually proceeds to say that "...the manufacturers anticipated progress in approving the efficiency of these models. Each year, the manufacturers remove 5 to 15% of their least efficient models."

I would like to also note that in the June 19th document that we just found last evening, that they respond within it to our comment. Their response is this -- we brought this issue up in the May meeting but the response is this "The Staff Report did not indicate that 15% of Lennox' models would be eliminated." The exact quote in the Report refers to "All manufacturers (on the average) would be required to design or retool 15% of their models, each year, to meet the 89 standard." Of course, obviously, the '89 standard is a typographical error. But nowhere in Page 22 does it speak of manuacturers on the average. But they go on to say that what is important is not the current fraction of (Lennox Models). Then it goes on.

I just seriously question the whole reasoning that lies at the foot of this issue. We're saying that the 10% retooling rate is inaccurate, and that currently if that 8.9 standard went into effect, nearly 90% of the models now avaiable in the State of California would not be available after that standard goes into effect. That is a tremendous impact on a manufacturer. That would be like if the Chrylser Company had 90% of its models absolutely removed from saleability and had to redesign all of their cars. You know, such a level of change is very pronounced and

there is no justifiable basis. Some of our products have been in our line for 25 years. Others may last 10 years. It all depends on the economic cost effectiveness of the product in the marketplace for the consumer.

We would just mention that we have the responsibility of warehousing replacement parts for all of the products that we sell, not only for the time that it sold, but also for a long period of time afterward. If we had to retool and change our complete product line each year as the staff reports somewhere between 5 and 15%, the amount of inventory warehousing needed for the inventory of replacement parts alone would break mid to small manufacturer's back. We couldn't financially afford such a situation.

There is also such things as the cost of development, the required agency approval on equipment, the manufacturer's tooling, the phase in and phase out of new products, the nightmare that it would represent in distribution channels, product changes, advertising, the dissemination of product line changes to service technicians and associated training. All those are responsibilities of the manufacturer. If we changed our product line 15% a year, we couldn't even keep up

with the changes. The whole idea is really very absurd.

And I think the thing that really needs to be noted is that on Page 44, the clear point there is that 90% of the product available (it's that last section) "...standards set at 9.0 will change from 90%...." Now, that means that without any other consideration, right now, what's available on the marketplace, you're requesting 90% of our product or the parts available, to be altered, retooled, redesigned. I think it has tremendous impact on a manufacturer.

Next, we very much find problems with trend line analysis that's been employed by the staff. We just would point out in the Warren-Alquist Act the word 'feasible.' And the word feasible there clearly has to do with what is available to the consumer. Okay, let's just take a little road here and examine that. They are saying that levels up to 13% SEER are feasible and attainable. Well, first of all, 13.0 SEER heat pump equipment currently does not exist. We would not say that they will never exist; but, they are not available.

The point is that they have taken a lot of information and drawn a line through it and said if this continues, this will happen. But, later on in the

report, we we talk about the amount of change that has gone into compressors, themselves. And you will find that it isn't a straight level line; but, it's a curve and it has much to do with cost effectiveness to the consumer. A consumer buys a more efficient product because he or she can get a rate of return or payback for the extra amount that they pay out for the efficiency that they are going to save. But, if that efficiency or utility bill--annual utility bill--if there are not savings on that to them, there isn't any reason for a consumer to go to a higher efficient product. That's the way the pre-market system works.

We believe that the word feasible, as Webster defines it, should be within reason. And we just feel like the trend line analysis that's been conducted is not within reason. On Page 13 of the staff document, it goes on to say that in early 1990, there will be equipment available, 13. SEER. How and by what basis?

CHARIMAN IMBRECHT: I'm going to ask you to move on. I don't see how that's relevant, frankly, since nobody's recommending a 13 in this proceeding.

MR. LEWIS: Well, I guess the point is that trend line analysis has been used throughout. I'll move right on.

The next item will be the single package heat pump systems and on the single package heat pump systems, there is the most pronounced effect. The reason why there is such an effect is because the second standard currently in place have no product offerings available. There aren't any product offerings available today for the second standard. For the first standard, it would affect very dramatically the product line. And if you can turn back to B, starting with B3, these are charts that we have used before; but, I believe they are still pertinent.

B3 shows the effect of going from a 7.5 to an 8 SEER, which would effect 43.71 percent. Going from a 7.5 to 8.5, as pictured on B4, it shows that 90.9% of the existing product would be removed; and, that's for a split system. Single package is on the next sheet, B5 shows 7.5 to 8. And then on B6, we showed the effect on single package which is 94.27 percent of the existing product of the California marketplace being removed. We think that definitely needs to be considered. The effect on a package system is much more pronounced.

Also, in the staff document, the items reviewed are: How many models are currently available? And we discussed this before; so, I will be very brief.

It doesn't really matter how many models are available. It matters very much as to whether a family is available. If a manufacturer's product's at 2 to 2.5, 3 to 3.5, 4 to 5, which is typical, in order for them to be able to be in the marketplace and providing equipment to the customers, the contractors, the small businessmen that they look to, in order for them to be in the marketplace, they need a full family product offering. You couldn't have.... A contractor would not install many different types of equipment on a residential housing development. He has to go back and warranty his parts and labor and have his men go out and keep everything going and people satisfied. It would be very expensive for him to have different manufactured products installed in a given housing tract. And that would be what would happen if models are continued to look at. We are saying that the analysis done is only partially accurate in that the whole picture is not reviewed.

We'll skip down to Page 15 where we mention about crankcase heaters. There was an exhaustive workshop on crank case heaters. There were a lot of question as to whether it was really significant energy use saved. Let me try that again. There was a big question about whether there was significant energy

saved on a statewide basis which the 25402(c) refers to by considering the crank case heaters.

That was never documented; however, we have put within this report that Lennox equipment has an average demand of approximately 23 watts of energy. We believe that this is a rather insignificant portion of the whole picture. Should be reviewed but shouldn't be overly weighted on the crank case heater issue.

Next, high efficienty heat pumps in the marketplace. Pages 20 and 21 of the Staff Report allude to a mistaken concept that there are more high efficiency heat pump systems available than are available in air conditioning products. We would ask that attention be paid to the accompanying drafts in this Report, Appendix B, which clearly shows that the effect of heat pumps is much more pronounced. Another error that we believe is very definable.

Then there were a number of procedural irregularities. The pricing information we believe that was requested, does not fulfill the requirement of the California Energy Commission, in their review of cost effectiveness to the consumer. We merely make the point again that it has, not to do with what a manufacturer says his product is. It has much to do with what the consumer pays for the product. Polaroid

might advertise a camera to be sold at $99. In reality, that product may not be available. And because of a shortage of supply, some people would charge much more for that. I know my daughter recently got a Cabbage Patch Doll. And I certainly paid more for that Cabbage Patch Doll than Calico expected.

My point is simple and that is that pricing information is important. It's part of the whole cost effectivenss analysis. And unless it's done from a consumer standpoint, the information that was requested and the information that the staff has based their cost effectiveness analysis upon, is not complete.

The next item is Three Phase Equipment. The Three Phase Equipment Report came out after the NOPA went out. We feel that this is quite an irregularity. It's very hard for us to try to respond to three phase power. And we believe that the items addressed in the Three Phase Staff Report leave a lot of questions unanswered. The whole three phase issue is very complex, when you consider the amount of items that affect three phase units use.

The amount of hours used, the type of use of a commercial system experiences, which a three phase system is, is significantly different from a residential system. A three phase condensing unit or

outdoor heat pump unit experiences more level operating use, while the costs are very likely to be similar to the single phase residential unit counterpart, the usage patterns, the maintenance patterns which must be part of the cost effectiveness analysis, are greatly varied. We can't find that the staff made any kind of a review on three phase systems, but instead relied on suspect document of this report that came out in May. In other words, the three phase issue relies on the cost effectiveness that we believe is in error in the May staff document.

Then there are a series of questions regarding the 15-day language changes. Actually, we are not opposed to the items which are recommended for change. As far as the change being lower, we believe that that would actually result in a more cost effective heat pump factor. We don't agree, though.... We don't believe that they went low enough; because, we don't think the cost effectiveness analysis has been done to base on the lower numbers. Be that as it may, at the bottom of Page 18, after we have received two changes, then some days later another proposed modification to the NOPA was sent out changing the lower level recommendation or the first standard of the heating seasonal performance factor to go into effect

January 1, to be altered from 6.6 to 6.4. The copy of which I have attached (and I have attached it to Appendix C) was mailed from the California Energy Commission and postmarked June 17th. It was received at our office on June 19, as noted.

Now, we have no direct argument with a level decrease and actually believe that even those levels -- 6.4 in '88 and 68 in '93 -- for those two standards are still above the level which are cost effective. It should be noted, however, that a statutory requirement for 15-day language was not met.

We did have a problem with the June 20 letter that came out, which was an errata on the 15-day language that was sent out that we received June 19. And this is the portion where we have some very specific problems with; and I'll quote: "The Commission mailed a copy of the proposed modification, together with a notice that identified the possibility of such a change to interested members of the public. Although the Commission was not legally required to make a notice or the proposed change to the public." This statement takes a fling at trying to pass normal dissemination of information serving notice of the Commission's intent to possibly withhold pertinent

information which completely stands counter to due process.

We do believe that the Commission has a responsibility to send out the information. We do appreciate information being sent out; but we think it's a requirement. And this is kind of an off-handed remark that may be later used. We want to go on record that we think information must be sent out, especially to the interested parties.

Then Point E is that there were two standards. We already made this point. There is a cost effectiveness analysis (flawed as it is) done on the first standard. Nothing has really been done on the second standard.

Then, we go into an area of the basis of cost effective analysis. I'm going to be very brief on this section. a) The discount rate that we believe is unjustifed and should not be used in government discount rates. b) Increased costs we believe is inaccurate. We thinking the waiting is inaccurate and we think field data must be gathered. c) The typical weather data: The weather data used by the California Energy Commission's state-of-the-art computer was inaccurate in the air conditining standard. We are still suspect of it and do not believe that the errors

have been changed. Nothing has been shown that the errors were changed from the air conditioning standard rulemaking. We really don't have any way of knowing what's happening in this rulemaking. d) The heat pump size: We definitely believe that 2½ ton system is the correct size. It would be good to have a little more review of field data, but we do concur with that.

Design life, of course, this is a whole matter which is very frustrating to manufacturers and the Energy Commission, both. But we would point out that considering design life, there are a number of items that actually affect what a design life is. How a system is used, what temperature the home is set at, what kind of comfort level is desired to be maintained, whether or not the homeowner uses the night setback thermostat, as it is intended to be used, whether the system, itself, is oversized for the dwelling or undersized, the amount of cycles that a system is put through in a given heat-ing and cooling season, how clean and dust free the nearby surroundings are to the outdoor section of the air conditioning and heat pump system. These are all major areas. And I think they need to be considered. Plus, I think, in the design life area, the whole maintenance factor needs to be reviewed, which I have found nothing whatsoever even

mentioned within the Staff Report.

Going on, pertinent information not considered in staff and committee recommendations, here I'll just take a few minutes. I think these are some important items. We believe, in the Report, that there is increased maintenance on a higher efficient product. And we also believe another factor that needs to be reckoned with is efficiency degradation. These two items kind of work together. And, we will try to paint the picture successfully to show exactly what effect the maintenance and degradation it officially has on the overall cost effective analysis.

We have provided, in Appendix E, a paper presented at Purdue University, touching this issue by a noted engineer. He goes on explaning why more efficient product--that there's a real liability factor involved. More current, though, is a study by an out-of-state utility. They went out and they have been paying rebates on higher efficient products. And we mentioned this, in brief, in our May issue...in our Ma (seems like they are being published regularly now) -- the May document. And that is that of those units that rebates were paid out by the utility on, 23% of them those rebate units, were short on Freon. The effect of this is that those units had a 52% increase

in operating costs. We make the point that this was very difficult for the utility, but needs to be considered equally by a standard setting body, such as yourself.

The same study also reviewed the operational characteristics of a high efficiency unit and found that the units were operating for a longer period of time, thereby providing less diversity for the utility. And this finding runs counter to the Staff Report's claimed benefit reducing demands for peak through regulated minimum efficiencies. Of the units reviewed that have the correct Freon charge, and this is, I think, maybe the most important item, the amount of build-up on the outdoor coil from debris such as animal fur, dust and dirt, lint from clothes dryers, leaves, cottonwood fibers and miscellaneous build-up from various environmental factors were shocking. When items such as this get caught in an outdoor condensing coil, it cannot properly perform, which lowers the overall equipment efficiency in a very significant matter.

Now, we go through a little explanation of what happens when a condensing coil gets clogged up from debris such as this. The heart of the issue is that part of what's happened by manufacturers to get

higher efficient products is to design the outdoor coil so that there's more heat transfer surface area. The more heat transfer surface area, when considered with other component changes, increases the efficiency of products. The old designs used to be 10 to 12 fins per inch. But now 24 fins per inch are often found on outdoor transfer heat transfer coils. With the addition of more fins per inch, the condensor coil, which moves air across the outdoor heat transfer coil, must be sized so as to overcome static pressure of that coil. Serious attention must be given to the sizing of the condensor fan so as not to draw more amps than are necessary, and yet, be sized sufficiency large enough so as to overcome the restriction of the more fins per inch.

When there is buld-up on the outdoor coil, as mentioned previously, that adds to the static pressure of the coil which the condensor fan must overcome. If the coil becomes clogged, the air cannot move across the coil. When this occurs, the coil does not relieve the amount of heat that is necessary to keep the system operating in ints most efficient perimeters. The key to this is in the field analysis, the second paragraph on Page 27, some of the coils in this clogged condition are actually operating at levels of 4.4 EER.

Now, what has to happen is one of two things. Either a person pays more maintenance on a high efficiency product to keep the product operating within its intended design parameters. Or, a person experiences a greater degradation factor of the efficiency with that product not receiving the maintenance factor that would be the other option. In other words, you pay for it one way or the other. Maintenance has not been an item factored into cost effectiveness. It is an item that affects the consumer or the purchaser of the product. And we, again, put in some information and further went on.

Compressor Efficiency: Prior to the Arab oil embargo in 1974, an average compressor motor operated at an 8 compressor rating point--ARI test report. The 8 compressor rating point level was typical for all compressors in operation, in and around the 1972-73 framework. In approximately 1975, motivated by consumer demand and cost effectiveness, the major compressor manufacturer looked towards improving the efficiency of the compressor by using a high efficiency motor. This brought about an immediate positive effect on compressor efficiency. The changes employed in increasing motor efficiency had been known for some

time. But, up to that point, were unmarketable due to it not being cost effective.

Improvement also came compressor valving, the way a compressor motor was cooled, the removing of restrictive items such as noise restricting mufflers which directly affect the discharge pressure drop of a compressor. What remains in further efficiency gains mainly center arounds compressor motor efficiency. It has taken another ten years for the bulk of compressor technology to move up to the 10 CRP level.

In summary, it took two to three years to move from 8 to 9, but then it took ten years to move from 9 to 10 CRP. The last move was slower in coming, mainly due to the extreme difficulty of moving to higher efficiency within the given restraints of technology.

We then go into a little point as far as what does one percent of a CRP increase actually...what is it actually worth. Then we go into a point where we're showing what kind of efficiency is currently available, the current compressors are at about the 87% level, a 92% motor would provide 5% more compressor efficiency and would cost approximately 50% more. A 5% increase in the efficiency of the compressor motor can cause the compressor cost to go increase between 50 and 60%.

The total system increase, then, is greatly dependent upon the transfer core. Considering these facts from another angle; 50% increase in the motor cost of the compressor could yield a .36 added compressor efficiency. This increase must be viewed in the full relationship of the amount of motor cost to overall system cost.

CHAIRMAN IMBRECHT: I going to have to interrupt. I mean, just reading your statement to us verbatim, isn't serving much of a purpose, in my judgment.

MR. LEWIS: Well, I guess I...

CHAIRMAN IMBRECHT: Can you try to give us the conclusions you're trying to suggest to us. And I've got to....

MR. LEWIS: I'll just make one brief statement before I give a conclusion and that is, the reading why in reading it is, I want you know I'm not a noted engineer with Lennox. The information that is in the report is there. And I can speak about it; but in detail, really, it's here. The whole point it's getting to is that in order to move to higher efficiency compressors, which is an intregal part of a outdoor unit, a person would incur or a customer would incur about a 20% increase in order to move the

efficiency level that is suggested in the first standard.

That 20% increase, of course, directly goes to the consumer. And the reason whey we point this out and the summaries, six points there on page 31, that's what we all arrive at; that's the end point. There is efficiency to be gained in compressor motors. It is costly. And it isn't directly.... The efficiency increase is not directly proportional in an SEER value. And to move a full point would cost in excess of 20%.

Now we believe that has an adverse, long-term affect, in that, manufacturers will be forced to redesign product to these minimums. And then the real engineering time, which should be spent on advanced systems, is not going into research. In other words, there are items sitting out there just waiting to be challenged which we have time allotted for that would move us into a completely new realm in air conditioning and heat pump design.

But when we have these series of interim steps such as the redesign necessary to get to an 8.9, and then the redesign necessary to move to the second standard from 8.9 to 9.9. Those are costly items that a manufacturer has to consider, especially when that first step includes 90% of our product. Those are

costly steps. Mid to small manufacturers just can't take those steps; large manufacturers probably can. We presented cases as to how it probably is of the benefit to certain large manufacturers to report separate costing data. Because of their economies of scale, because of their ability to retool and change, the effect upon them is much less then a mid to small manufacturer.

Joe McGuire made a comment, according to your questioning, Commissioner, regarding what percentages, mid to small. And he said 10%. I guess since he is an authority and I'm not an authority, I guess I can also make a guess. And that is that the 10% is very conservative number, and could very likely be, in the State of California, in the 25% area. We have a hard time getting that information because there is any central reporting of actually what market share is by different competitors. This report is the first time that we knew Carrier had such a bold 22 percentage of the market place in heat pumps. We just merely point out why it's cost effective for a major manufacturer, and why it's not cost effective to a small manufacturer to make such changes.

Then, I guess there are two quick items for me; and Ted needs 30 seconds, he said. First of all,

we believe that if the information is suspect on which the basis of an efficiency increase decision is made, we feel like there is really questionable...legally it's really a questionable decision.

Secondly, we believe that the amount of work that's gone into this has not been the last minute type work. We have been working right along and have tried to respond even to the latest June 19th document that came out very surprised to us, that we received through the dockets, not even knowing that it was available. And it came out June 19th.

Further, Mr. Ted Baily from Carrier Corporation read a letter from Mr. Bob Stevens. And, you know, there's such a thing, I guess, as guilt by association. But I would just point out that in Bob Stevens' letter he doesn't say anything about a 15 year design life for a heat pump. He merely says that the old values that were used and assessed and thought accurate have probably moved up the scale. We, in all of our testimony, have never gone counter to that; we haven't changed our position. We believe though, that the levels that the staff has looked at in their sensitivity analysis are definitely overrated and unbalanced.

CHAIRMAN IMBRECHT: If you are finished, I'm going to ask our counsel to comment on the questions that you raised relative to the various notes.

MR. GILLES: I'll give you my 30 seconds, Mr. Chairman. I do want to emphasize what Dave said about the effect this has on our internal planning. I am Director of Advanced Energy Systems for Lennox and have been for some years. And I am totally dedicated to long-range, highly cost effective equipment. And every time we get involved in one of these it deters that much out of our basic effort towards gas-fired heat pumps. We've got two programs; we've got two thermal energy storage programs; we've got, currently, one advanced electric heat pump program of major consequence. And it's a terrible deterent to get involved in this.

The other thing I want to amplify or may be clarify is the reference to ASHRAE's standard 90.1(p) which is now known as regarding the similar standard that ASHRAE's had through the years past and what transpired at Honolulu. I'm not sure that Mr. Baily was there. I was present at all three sessions on Standard 90 at Honolulu. And the six-person vote to release that document for public review is in no way--and I assure you--an endorsement by ASHRAE of that

document. It was a matter of was a matter of great debate during the conference. There's a front-page editorial on this week's air conditioning news that goes into considerable depth on the subject; so, that issue's far from over.

MR. LEWIS: There's even some legal questions regarding that ASHRAE item and that is that the person that chaired the subcommittee is not even a voting member of that Committee and happens to be a major manufacture that has 20% of the heat pump market place in California. I just question whether there should be any kind of weight put or placed on an ASHRAE document that is merely receiving public review.

CHAIRMAN IMBRECHT: Okay, fine. I ask you comment on some issues that were raised relative to....

MS. DICKEY: I'd like to comment on a couple of the procedural "irregularities" that Mr. Lewis describes. I think there's some misunderstanding here of the legal requirements to which the Commission is subject to pursuant to the Administrative Procedure Act. First of all, regarding his statement about the three phase staff report, the Commission is not required to mail out the three phase staff report. It is only required to make it available on and after the date that the date that the NOPA was public, which was

May 10th. The fact that the Commission chose to mail it out on May 8th, two days before the NOPA was published was a courtesy. And the fact that the Commission chose to do that, even before the NOPA was published,was, I think, a significant effort on the part of the Commissions staff to make sure that the parties could have the opportunity to comment. As it was, it clearly exceeded the 45-day requirement of mailing the NOPA.

My second comment, is regarding mailing of the 15-day changes. The Commission is not subject to any requirement to issue a notice of 15-day changes or to mail out a copy of 15-day changes. The Commission is, however, required to state in the NOPA itself who may be contacted in the event that 15-day changes are issued. My name was listed in the NOPA. I received no phone calls from Mr. Lewis or from anyone from his company.

As a courtesy, two members of the public who had participated extensively in proceedings, such as Mr. Lewis, we drafted up a Notice of the 15-Day Changes and mailed out a copy. The fact that he received the copy of those changes on June 17th is not in any way reflective of a procedural irregularity; it was merely done as a courtesy. Had Mr. Lewis been interested in

affirmatively calling me every week, I would have been happy to have received his phone calls. However, I received no such calls from him. And I can only emphasize that with regard to both of these issues, the Commission not only met the legal requirements but exceeded the legal requirements.

MR. LEWIS: Well, a quick response. We would be.... I believe it is important that all assumptions that a NOPA is based upon be available to the public. And up to this point, we have not found them readily available. The second item is, I really do not have time to sit at my desk calling every two or three days to see if a NOPA has changed. I just don't have that kind of comfort in my time.

CHAIRMAN IMBRECHT: Okay. Does that complete your presentation? Further questions from the members of the Commission? Thank you very much. Next, Mr. Bill Huston representing California Building Industry Association.

MR. HUSTON: I think my comments will be a bit shorter then those of Lennox.

(LAUGHTER)

COMMMISSIONER COMMONS: Oh, I thought you were going to stay here and buy us dinner, Bill.

MR. HUSTON: If we go past 5, I'll do that. Maybe I shouldn't have said that. Pizza King still delivers, don't they?

CHAIRMAN IMBRECHT: Let's move this along folks. We've got a lot of other items on the agenda.

MR. HUSTON: Basically, my comments are the same as in the letter I addressed to Commissioner Noteware on June 14th; and, I think each of you receive a copy.

We have one philosophical difference, having to do with the standard setting procedure and a more practical question on availability of products that actually meet the standard. The philosophical difference, basically, has to do with the take (and it was mentioned by Mr. Varanini earlier today, as well as Marshall Hunt). It's basically taking an option away from the builders and new residential construction.

Currently, high efficiency air conditioning and heating equipment is considered against other conservation options, depending upon the design of the structure, the climate zone and the amount of energy savings versus the cost of each of those options. By requiring higher efficiency heating and cooling equipment, that option no longer exist. Although, in new construction, there will be no additional energy

savings. So what may, in fact, happen is the builders are required to put in an option (that used to be an option) at perhaps higher cost than another alternative getting the same energy savings. And we're concerned that that can lead to increase housing cost without any increased energy savings because of the performance nature of the standards. The second point has to do with the availability of....

CHAIRMAN IMBRECHT: I take it that's not a recommendation that we tighten building standards?

MR. HUSTON: I'm sorry.

CHAIRMAN IMBRECHT: I take it that not a recommendation that we tighten building standards?

MR. HUSTON: That's correct.

CHAIRMAN IMBRECHT: Okay. That would be one obvious....

MR. HUSTON: Certainly. Philosophically though, the standards are set based on lowest life cycle cost. And clearly by adjusting the standard piecemeal, you're getting away from lowest life cycle cost, perhaps. And that's an entirely different, very major issue though.

Availability of products: that has been mentioned by several of the earlier speakers. We have basically the same concerns. Certainly with the '93

standard, we're concerned that there are potentially no single package units that will meet that standard. We're concerned about the limited number of models that meet the '88 standard. I suppose, as a compromise, we could accept the '88 standard; but, we really question whether the Commission should set a standard for '93 where there is such a limited product availability now and certainly no assurances from other than one manufacturer that that standard is going to be able to be met seven years hence.

I can certainly respond to any questions that you might have.

CHAIRMAN IMBRECHT: Other questions? Okay. Thank you very much, Bill. I believe Mike Gardner, from Edison, wanted to just briefly addend his remarks.

MR. GARDNER: Thank you, Mr. Chairman. Mike Gardner for Southern California Edison. Rather than adding to my remarks, what I would like to do is offer to the Commission one additional document which may be of some assistance to you.

I received today a copy of the paper that was presented at the ASHRAE proceedings in Hawaii over the weekend. And I thought it might be useful to you to have that in your record. There is a minor difficulty with it; and, I've spoken with your General Counsel on

it. There's some fine print at the bottom which says, "Not to be reprinted in whole or in part without written permission." So, what I would like to do is provide the Commission the one copy that I have. And Mr. Chamberlain has indicated to me that he would seek the written permission to reproduce it. So, I don't think there are new data in it. I think it's the same data that was in the original Alabama Power Study in a slightly different format.

Just for your information, the conclusion section indicates that the median age to replacement for the units in the study was twenty years. The range of median replacement life on a manufacturer to manufacturer basis, range from 16 years to over 20 years. And interestingly (I'm sure why) but, almost half of the units that were replaced were still functional at the time. They were operable units. And for whatever reason, the consumer chose to replace them with a new model. I don't believe that there are data as to whether that was to achieve a higher efficiency or fresh paint or what.

VICE CHAIR CROWLEY: Repossessed.

MR. GARDNER: I do not know. Anyway, I would like to offer this for your benefit. And good luck,

Mr. Chamberlain, in finding out how to get it reproduced.

VICE CHAIR CROWLEY: Thank you, Mike. I've lost the list of people.

CHAIRMAN IMBRECHT: Does anyone else which to be heard on this matter? Mr. Baily, your name has been taken in vain a few times. I wouldn't say that necessarily, excuse me. Let me amend that. You have a right of personal privilege, I think, to come forward.

MR. BAILY: Thank you. Ted Baily with Carrier, please. Commissioners, I don't intend to take much time. But there is one item that was mentioned that I would like to respond to; because, my name was taken in vain in that respect pretty well. Other things: I think we really beat number of these issues to death in the workshops and the previous hearings. And I think it's all on the record; and, I believe that you will make up your mind on the basis of the record.

There was a question raised as to whether or not the distribution of heat pumps in the California market was ARI data or not. That is the question I would like to respond to. There was also a question raised on the same subject in an item that was introduced to the docket on June 26, 1985--today--by the Trane Company.

The first paragraph of the Trane Company document reads, "The California Energy Commission staff makes numerous references to ARI shipment data of heat pumps into California. However, this shipment data the staff uses is incorrect and should not be attributed to ARI." The data that is being referred was submitted to the Committee on February 21, 1985 of the hearing at the Southern California Gas Company in Pasadena. On page 45 of the transcript of that day, in response to a question, which appeared on Page 44 from Mr. Pennington about whether or not that data showed a trend, I responded as follows:

> "I don't know. I think the significant thing would be to look at the 1984 data when it becomes available. But, if you go back and try to create trends, it's difficult to do that. But I don't know what the trend is. All I've tried to do is to pick out the most recent year for which we had complete information to give us a starting point for the discussion. And what I conclude in it is that you can't really make any

conclusions from the data as to where heat pumps are used to a much greater extent then others because it's so spotty. It depends on a lot of factors -- the sales effort, the type of distribution, the climatic conditions, the utility incentive programs. There are all kinds of things that affect it. My conclusion is that you can't generalize and say you ought to treat heat pumps differently than air conditioners; because, I don't see that conclusion in the data."

Mr. Pennington then asked:

"When will the 1984 data be available?"

And I responded:

"About a month, Dick Denny says...." (Dick Denny, incidently, is from ARI and was present at the hearing.) And as soon as it's available we can massage that data;

because, that's by all sizes. I think it's 65 and below. Is that not? Am I right on that, Dick, without any distinction on the efficiencies of it."

Mr. Pennington asked that ARI provide that data as soon as available. I said:

"That would be the best place to get it; because, they'll have it available before the members get it.

Commission Commons asked Rick (referring to Rick Oakley):

"Rick could we make that request of you, then, please?"

Mr. Oakley responded:

"Sure."

And it went on, then, to other information. It seems to me from that dialogue, that the data that was presented by Carrier, in an effort to be helpful in trying to get a line on how heat pumps were distributed in the State of California, was an opening bit of

information to start the dialogue. And it was agreed upon by ARI's representative, Rick Oakley, that ARI would provide the 1984 data from which perhaps a trend line could be established. Whether or not ARI provided that data as had been promised, I do not know. It would not appear that that happened.

The data that we provided was based on ARI data. We submit trading area shipment movement data. I should say 'movement.' It's when we ship from a distributor to a contractor or a dealer, or at least to that line of distribution. It is reported to ARI; ARI then aggregates the data and sends it back to the members. It is available from ARi by total heat pumps (all kinds), total split systems, total single package, splits less than 5 tons and single package less than 5 tons. Now with all that availablity of data, I'm sure that any kind of information could have been gotten from ARI both for 1984 and 1983 to establish some kind of a starting trend.

Mr. Wolfe, in his comment, goes on to say at the February 21, 22 workshops in Pasadena, Carrier presented, took the staff and attendees the map of Attachment 1, entitled 1983 Industry Distributor Shipments. This map and data was represented Carrier to show ARI member company shipments the indicated

California trading areas. This was an incorrect representation by Carrier on four points.

One, ARI trading area shipment data is for heat pumps of both single package and split system units combined as a single number. Yes. That's correct and I don't see that it makes any difference; because, we were talking about heat pumps. And we submitted to you data about how those two break down as far as cost and so forth are concerned.

Second, ARI trading area shipment data is for both single and three phase equipment combined as a single number. That is correct. I don't see that it makes any difference.

Three, ARi trading area shipment data is for all sizes of heat pumps, regardless of size. This means it includes units larger then 65,000 Btu per hour. That is correct. However, I think if you separate the 65,000 Btu and over out of that, it's not going to change the percentage distribution in the State of California even by a 10th; it will be a very small amount.

If that were not satisfactory because of the possible variation because of the distribution of greater then 65,000 as opposed to less then 65,000, I

would say that one should seek the data broken down in the way that it might be broken down by ARI.

Item 4: The numbers, as represented, are incorrect ARI numbers. The proper ARI numbers are shown in Attachment 1 (which was the Attachment 1 that I had submitted) in brackets. As the number of heat pump shipments are incorrect, we would expect that the percentage numbers as caluclated by Carrier are likewise invalid. There is a difference between the numbers that Mr. Wolfe put in in brackets and the numbers that I submitted. And I'll tell you what that is.

Again going back to the statement that was made on the record, that this is based on AIR data, our marketing statistics people expand the data received back from ARI. By expanding, they muliply it by a factor in order to get up to a guesstimate as close as we think we can get to what it would be have all manufacturers' submitted data, rather then just a report back that comes from ARI as submitted.

You will notice that the difference between the bracketed numbers and the whole numbers as originally submitted is .85. .85 is the number that the ARI numbers are divided by to achieve the expanded numbers.

I agree with everything Mr. Wolfe says; he's absoultely correct. I don't see that it makes any difference whatsoever in this proceeding. Thanks very much for the time. Any questions?

CHAIRMAN IMBRECHT: Commissioner Commons.

COMMISSIONER COMMONS: Would that 15% represent the small, medium-sized manufacture -- that illusive number?

MR. BAILY: I have no idea, Commissioner.

CHAIRMAN IMBRECHT: Okay. Thank you. Alright. Does anyone else which to heard on this matter? Yes sir, please come forward.

MR. DASSLER: My name is Dale Dassler, I'm with the Snyder General Corporation.

In listening to the deliberations today and in the past, very little has been said about the three phase equipment and the use of SEER and HSPF on those products. I think it's been pretty well agreed by everyone that these are commercial products and that the only place that you find three phase power available is in the commercial segment. For that reason, I think we ought to all take a real good look at what the commercial load is. I think it was also demonstrated pretty conclusively that the load is different. It is an entirely different load for the

same size building. It's a daily load; it's a load that includes a lot of internal heat gain. So consequently, you have a different cycling rate on this product.

SEER, as established by the Department of Energy, as a seasonal energy efficiency ratio and it was calculated by a very strange method. We take the temperature of 82 degrees and say this is the temperature that we're going to degrade and take our cyclying degradation at that point. That's not the right one if you're going to look at a commercial product. This was done for residential use. The residence, okay. It seems to work fine.

If you're going to establish a seasonal energy efficiency ratio for a commercial product, it wouldn't be done in the same manner as it's done in the SEER rating. For that reason, I believe that you would much wiser to continue with EER and COP; because, HSPF has exactly the same connotation to it, it that it's a contrived descriptor related only to residential use.

So I believe you'd be much better off to stay wtih your EER and COP for the three phase commercial equipment. That's all I had to say.

CHAIRMAN IMBRECHT: Okay. Thank you. Anyone else wish to be heard? Mr. Rauh.

MR. RAUH: Yes. We just had two points we would like to make very quickly in response to two issues that were recently raised.

MR. PENNINGTON: First off, we would like to point out that staff did a wide range of sensitivity analysis that looked at possible variations in the benefit side of the equation and the cost side of the equation. And we feel that that sensitivity analysis bracketed all reasonable, possible cases. And we found the standards, both the 1988 level and the 1993 level to be cost effective today under that whole range of sensitivity analyses.

Second point that we would like to respond to is the issue of double counting related to the building standards. In the past, the Commission has made a policy of keeping separate, the appliance standards proceedings and conclusions from the building standards proceedings and conclusions. And the building standard would not address efficiency improvements of appliances in their deliberation. So we took as a given whatever conclusions came out of appliance standard proceedings as the baseline.

The building standards that we currently have now were based on the assumption of an 8.0 SEER for cooling equipment and did not address any efficiency

improvements beyond that. At this point, we have done an analysis on improved efficiency of cooling equipment in a separate proceeding--the Appliance Standard Proceeding--assuming the building standards as the baseline. So, if you will, the cost effectiveness conclusios we've made here reduce and result in lower life cycle cost from the bottom of the buildings standards' life cycle cost curve. So basically, we're not, in any way, double counting. And, in fact, these standard are cost effective off of the bottom of the lowest life cycle cost curve for building standards. Those were the comments we had.

CHAIRMAN IMBRECHT: Alright, fine. Thank you. Okay. Commission discussion. You have the courtesy obviously, Commissioner Noteware. Otherwise, I have a few comments I would like make, as well. Please go ahead.

COMMISSONER NOTEWARE: Would you like to go first?

CHAIRMAN IMBRECHT: Well, I'll give it a shot. For openers, I would just say that, as I -- and I'm being redundant, I realize -- but, I continue to have some skepticism about the second tier that's in the NOPA which is before us for 1993. My feelings with respect to this issue are not dissimilar from what they

were with respect to air conditioning. Same time, I would note that there is ample opportunity throughout the remainder of this decade, assuming there are technological advances, etc. that a standard might ultimately be set at that level.

I do believe that, in terms of the cost effectiveness analysis of going from the 8.0 to 10.0, that I, frankly, do agree with the perspective advanced by Lennox, that it would have been appropriate in terms of evaluation incremental cost that that evaluation be, first, an 8 to 9 and 9 to 10. That is absent from the evaluation which is before us.

I would note and I would agree with some of the comments were made that I think the Presiding Member's Report by Commissioner Noteware was an excellent evaluation of the entire issue. And, I might say, probably the only succint evaluation of the entire issue which we've had before today, which I appreciate very much.

And I would just note that with respect to the lengthy discussion that we also have from Lennox relative to Table 17, that, though, they came forward with no numbers of their own to supplement those other than to...that were presented other than to note the errors, I would just suggest that in the Presiding

Member's Report, in fact, those errors were caught and were accurately represented with respect to what were the underlying figures.

It does not seem unreasonable to me, looking at the range of numbers that are in his Report, ranging for the split system and focusing now just on the incremental cost of moving from 8 to 9, that a range of costs on Page 9 of his report for split system indicate a low of 121 by Carrier to a high of 231 by ARI incorrectly correctly reflecting the staff's evaluation of 199 with even Trane coming in below the staff's evaluation. It does not seem to me that anything has been presented today that calls into serious question the conclusion of the staff that 199 is, in fact, a reasonable incremental cost for us to render a decision upon. And I would note, in particular, the fact that two major manufacturers both report incremental cost are actually below that which was arrived at by the staff. And moreover that the staff is, as I say, not all that appreciably different from the ARI numbers at 231.

In essence I would make that same statment with respect to the package units. Again, we've got a range of 103 to 221. Though Lennox suggested to us that the appropriate number in the errata should have

been 195, it appears to me from the Presiding Member's Report, perhaps, that might have been 193. But in any case, again, the staff concludes an incremental cost that is actually higher, in this case, by a greater percentage than that which is reported by the two individual manufacturers which did provide the specific data for their incremental cost. Again that suggests to me that there is reasonableness to those conclusion rendered by the staff which in essence have been adopted by the Presiding Member.

With respect to the issue of the HSPF levels, and I believe, if I understand correctly that, in terms of the NOPA that have been issued, if we chose to adopt the slightly less stringent number for 1988, namely the 6.4, that that was in a subsequent NOPA, then we would have to wait until tommorrow to satisfy the 15 day requirement.

May I inquire, is that, would that a cumulative NOPA that would deal with all of these issues or just that singular issue?

MS. DICKEY: Tommorrow we could adopt the second version that was made available to the public. And it would not be used exactly as the version that made available on June 12th.

CHAIRMAN IMBRECHT: I understand. But, that version included the 6.4 but also the other numbers of 8.9 and 9.9 for respective dates. Alright. Well, I would just indicate that it's my general inclination that that NOPA would be the appropriate one to adopt, but with the following proviso. And I want to thank Mr. Chamberlain for assisting me -- and Ms. Dickey, as well -- in terms of trying to find a procedural method by which we might be able to reflect my judgment that it would be inappropriate to adopt a second tier today, not only because there is a greater range of numbers relative to the incremental costs. And I think that the foundation for those numbers is subject to greater potential discussion. I don't see the bracketing of the numbers by the various submitters as being within the same relative range as is the case of moving from 8 to 9; and moreover, as I indicated earlier, I do think that the appropriate incremental cost would be a 9 to 10 rather than an 8 to 10.

For that reason, speaking as an individual Commissioner, it would my suggestion that we attempt to adopt to adopt the first tier only and evaluate the second tier. Of course, as I argued with respect to air conditioning standard, as well, at a more appropriate time--at some point later in the 1980s--at

which time we could evaluate not only more accurately the impact upon the manufacturing community, but also upon the consuming public of California. While I am, in fact, concerned about the impact upon the maufacturers, it seems to me that our ultimate responsibility does not flow to them, but actually to the consumers of California, both in terms of homes and also in terms of retrofit products as well.

I also have some concern from the points raised by the building industry about availability of product, etc. And while appreciate Carrier's position -- they would like to supply all those products -- that raises certain questions of potential monopoly in my mind that I would not like to subject the building community or the consumers of the State to, frankly.

It does appear to me, I'm advised however, that since we did not unfortunatly publish two separate NOPAs that carried with them both a two-tier approach and also the single-tier approach that we be left, in essence, with only the option from a strick interpretative standpoint of only adopting the NOPA that's before us that carries both tiers.

Mr. Chamberlain suggested that if the remainder of the Commision were persuaded, this would be the appropriate approach to take, that we could

adopt the NOPA as presented but subsequently adopt an amendment which would direct the staff to only submit to the Office of Administrative Law of the first tier. The question would be and I would presume that there are no -- well, perhaps, that's an inaccurate presumption -- perhaps no parties would challenge that or urge the rejection of the entire regulation on that basis, although it is conceivable that OAL might chose to do so.

Were that the case, however, I would just note that the entirety of the regulation would have been adopted and could then be submitted to OAL. And under the terms of AB 191, I believe that we would be in a position to amend that within one year after providing notice to the Legislature. In essence, I would suggest that we immediately provide that notice with the full intention of rescinding the second tier after the passage of the one year time period in June of 1986. I think that's.... Am I actually reflecting your advice, Mr. Chamberlain?

MR. CHAMBERLAIN: Yes. And just so that the Commission has full information -- you know, this 191 is a very difficult statute. It probably would require a....

CHAIRMAN IMBRECHT: I notice that Commissioner Varanini is not here to accept responsibility for that. I think he was one of the consultants.

MR. CHAMBERLAIN: It probably would require a four-fifths vote at that time. And a finding that the change, since it would arguably result in a decrease in the stringency of the standard, that the change would benefit ratepayers. I think you should know that.

CHAIRMAN IMBRECHT: Well, that makes it more difficult, obviously. In any case, that's generally where I'm at. Colleagues, I'll leave to you to express your own judgments about what should be the appropriate action. Commissioner Noteware.

COMMISSIONER NOTEWARE: Yes. Mr. Chairman, the staff has done a 9.0 to 10.0 run which finds 10.0 to be quite cost effective. In fact, if the cost of increased efficiency decreases by the time that the '93 standards take effect, then the standards will prove to be even more beneficial to the consumer.

Thank you for you kind words about the Presiding Member's Report; although, it's not totally without error, also. I should point out that we spelled Mr. Baily's name wrong on Page 4. And on Page 2, there's a date that says 1/1/96 which, obviously,

should be 1/1/93. There are couple of other minor typographical changes which don't affect the end result.

I'm a little disturbed. We heard some things here today, which sounded a lot more like a workshop than a business meeting. And I don't feel that we can summarily disregard the statements and the criticisms that were made. Yet, I'm still comfortable with the bottom line in the Presiding Member's Report; and, I'm comfortable with our staff's report which leads to the conclusions.

I want to point out that the downside of not adopting standards now, obviously would be that we be faced with over a year from now coming up with some standards that would specify, or coming with a document that would specify standards for 1988. And it would be very, very difficult in the short timeframe then that would be provided for the manufacturers to meet these standards. And I think rather then go through that I still feel that what we have here is realistic and in the best interest of the citizens.

CHAIRMAN IMBRECHT: Okay. Thank you. Further comments? Commissioner Crowley.

VICE CHAIR CROWELY: Mr. Chairman and Commissioners, I concur with that. I believe that,

because we have already established a two tier for another level of air conditioner size, that it would be appropriate to be in harmony with that and that it would not be as beneficial to have one tier; because, I believe that we have time to modify the second tier since it does not take effect until 1993 and even, were it to be modified, in the meantime, it provides a signal to the industry that I think is helpful. So I believe that the recommendation by the Presiding Member is the appropriate thing for us to do in this situation.

CHAIRMAN IMBRECHT: Commissioner Commons, you're uncommonly silent.

COMMISSIONER COMMONS: Nods -- No, indicating no comment.

CHAIRMAN IMBRECHT: Alright. Fine. What's the pleasure of the Commission?

COMMISSIONER NOTEWARE: Well, Mr. Chairman, I move to adopt the recommendation from the Presiding Member's Report.

CHAIRMAN IMBRECHT: Is there a second?

COMMISSIONER COMMONS: Second

CHAIRMAN IMBRECHT: Seconded by Commissioner Commons. Let me just make an inquiry. Relative to the matter of the 6.6 versus 6.4 that....

COMMISSIONER NOTEWARE: I still feel that 6.6 is the right way to go.

CHAIRMAN IMBRECHT: Alright. Fine.

VICE CHAIR CROWLEY: And that's Alternative 2?

COMMISSIONER NOTEWARE: Alternative 2. Right.

CHAIRMAN IMBRECHT: Alright. Is there further disucssion?

MR. CHAMBERLAIN: Mr. Chairman?

CHAIRMAN IMBRECT: Yes.

MR. CHAMBERLAIN: According to Ms. Dickey, there are four amendments before you. I'll let her explain.

CHAIRMAN IMBRECHT: Alright.

MS. DICKEY: I believe the Commission needs to take action on the four different amendments. We have been primarly discussing or specifically discussing the amendment to 1604(c) which actually sets forth the standard. However, there is an amendment proposed for 1602(c) which would define the term 'heating seasonal performance factor.' As the regulations now read, that term is undefined; and, leaving that term undefined would cause a clarity problem.

Amendment has also been proposed to Section 1603(c) which relates to, I believe, the test methods for heating seasonal performance factor--or excuse me--for heat pumps. And since we're setting these standards, we do need to bring our test procedures into harmony with that.

Additionally, there has been a change proposed to Section 1606(c) which would merely update the title of the form for certification of air conditioners and heat pumps. So I would just recommend to the Commission that you take action on all four.

VICE CHAIR CROWLEY: Those are all in the Presiding Member's Report.

CHAIRMAN IMBRECHT: Those are all ecompassed within Commissioner Noteware's report and, therefore, would all be encompassed with a motion.

COMMISSIONER NOTEWARE: That was our intent.

COMMISSIONER COMMONS: Point of information.

CHAIRMAN IMBRECHT: Commissioner Commons.

COMMISSIONER COMMONS: Commissioner Noteware, I assume your motion included both heat pumps and three phase.

COMMISSIONER NOTEWARE: Yes, it does.

CHAIRMAN IMBRECHT: Further discussion? Is there an objection to unanimous roll call. Hearing none, ayes: 4; nos: none. The motion is adopted.

(Thereupon Item 1 of the Business Meeting of the California Energy Resources Conservation and Development Commission was adjourned at 3:45 PM.)

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REPORTER'S CERTIFICATE

THIS IS TO CERTIFY that I, Dawn Lofton, Reporter, have duly reported the foregoing proceedings which were had and taken in Sacramento, California, on Wednesday, June 26, 1985, and that the foregoing pages constitute a true, complete and accurate transcription of the aforementioned proceeding.

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

Dawn Lofton
Reporter

Dated this 3rd day of July, 1985.