STATE OF CONNECTICUT

SITING COUNCIL

CONNECTICUT LIGHT & POWER COMPANY AND UNITED ILLUMINATING COMPANY	JULY 27, 2004 (10:05 A.M.)
APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION OF A NEW 345-kV ELECTRIC TRANSMISSION LINE AND ASSOCIATED FACILITIES BETWEEN THE SCOVILL ROCK SWITCHING STATION IN MIDDLETOWN AND THE NORWALK SUBSTATION IN NORWALK, CONNECTICUT	DOCKET NO. 272

BEFORE: PAMELA B. KATZ, CHAIRMAN

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AN INTERVENOR, JOSEPH CRISCO, JR., STATE REP. 17th SEN. DISTRICT

AN INTERVENOR, LEONARD FASANO, STATE REP. 34th SEN. DISTRICT

. . .Verbatim proceedings of a hearing before the State of Connecticut Siting Council in the matter of an application by Connecticut Light & Power Company and United Illuminating Company, held at Central Connecticut State University Institute of Technology & Business, 185 Main Street, New Britain, Connecticut, on July 27, 2004 at 10:05 a.m., at which time the parties were represented as hereinbefore set forth . . .

CHAIRMAN PAMELA B. KATZ: I'd like to call the resumption of this hearing for Docket 272 to order.

I'm going to make a few introductory remarks about what we're going to accomplish this week. Then we are going to swear in one of the Applicants' witnesses and then they will do an audio visual presentation. I'm going to ask that we hold questions before, during, and after that presentation and take those questions up during our regular cross-examination cycle.

To start -- just -- just to give you an idea, that back in the spring I was really optimistic about this docket, things were starting to gel, I could see the -- the Council members, we could start seeing solutions coming and -- and things were coming together

and we could see the light at the end of the tunnel. Well, the light ended up being the headlight of the oncoming locomotive of the Holyoke Express and we sort of got knocked back down the tracks several hundred yards, but I'm starting to get optimistic and energized again, that I'm -- we're being able to visualize, hopefully, how this docket is proceeding and again being able to see possible solutions to this.

A couple of things, with your help, we are going to accomplish this week. We are going to discuss today and into tomorrow morning EMF mitigation/reduction and buffer zones. If you read the transcript for the House debate on the public act concerning buffer zones, it gives broad discretion to the Siting Council on what the buffer zone is. And on that turn, we appreciate all the parties and intervenors and legislators who submitted statements on what they think the buffer zone should be. That was very helpful. And today what we need through your cross-examination is to help us Council members crystallize in our minds what would be a buffer zone.

The buffer zone's purpose is to protect the public health and safety, especially in regard to residences, schools, playgrounds, day care centers, etcetera. But even though it doesn't say this in the

legislation, it must also be practical, because I think the buffer zone that we come out of with this docket is going to be the starting point for future dockets in regards to buffer zones. So we need -- we need your help on helping to determine what these buffer zones will be.

Also today we are hoping to get again -- sort of be able to get down a firm idea on the potential for EMF mitigation and what that will do and what that won't do -- (audio failure) -- we're all on the same page of the hymn -- (audio failure) -- well a door in some cases -- (audio failure) -- we are continuing undergrounding as directed --

(Interruption - audio failure)

CHAIRMAN KATZ: These things happen to Rodney Dangerfield and to me.

Okay, we're -- where was I -- oh -- we are going to continue to maximize undergrounding, but we also realize there may be a portion of this line, we have no idea how much, that will remain overhead. The Council realizes that we want to make this -- this is going to be an important piece of the solution; if it is overhead, it's got to work, it's got to look good, which is why we want to -- we want to this week get an idea of EMF mitigation, heights of structures, and buffer zone. So if

there is a portion that's overhead, we do it right. And again, we're asking for your help on that.

Also, tomorrow -- probably tomorrow afternoon, we have asked all the Towns to indicate to us their preferred route, underground, overhead, and combination. This was not meant to be a trick question. The Council members really want to know and understand the Towns' preferences in this area, so it will be part of our big decision-making effort. So we're going to do that.

Thursday is going to be exclusively DC. KEMA, our expert -- our in-house expert has indicated to us they wanted us to look at DC. It seems like we are getting some consensus on that. And we are going to spend Thursday exclusively on DC so that again we get a firm understanding of that technology and how it might work in this system.

So that's the plan. Hopefully, we will be able to walk out after three days -- (1) walk out after three days; and (2) that you've left the Council members with a good understanding of what you think this solution should be for those portions that remain overhead, and also whether DC works.

So we are going to start off -- Mr. Marconi, we are going to swear in a witness and then we

are going to start off with the Applicants' presentation. And again, I ask that you hold off questions until after we get to cross-examination. Mr. Frank.

MR. MONTE E. FRANK: Yes, thank you, Chairman Katz. Monte Frank on behalf of the Towns of Wilton, Weston, and Woodbridge.

First, thank you for giving us the opportunity to discuss our preferred route. The Towns certainly appreciate that opportunity. Given the short notice, the towns at least that I represent will not be prepared to do that tomorrow, but we relish the opportunity to do so and would like to reserve our right to do so at a later day.

CHAIRMAN KATZ: So noted.

MR. FRANK: Okay. Secondly, with respect to the presentation, during the last set of hearings, I requested on behalf of my towns that the Applicant provide in advance a copy of what they would be presenting to the Council. And I think it was agreed that they would do that. We are now here, they are making a presentation. It is my understanding it will contain some new information with respect to split-phasing and other items. We have not seen it. I think it's unfair to expect us to cross-examine on it today or even this week without having

any sort of knowledge as to what the content of the materials are. And so -- I don't have an objection to the presentation, but I would like to be able to cross-examine, if necessary, at a later date based on the materials.

CHAIRMAN KATZ: Yes. I envision a cleanup day at the end of the hearing process and these -- a lot of these things that are still bubbling along can be taken care of at that time.

MR. FRANK: But it may require the Applicant to bring these witnesses back.

CHAIRMAN KATZ: Understood.

MR. FRANK: Thank you.

MS. LINDA RANDELL: Chairman Katz, might I respond -- are we all set here? I'd like to respond. The presentation is not new information. It is presenting information that is otherwise in the record or will be adopted today; for example, the mapping that was submitted already. But of course we have no problem with people inquiring about the information that we present. But I wanted to be clear that this is not, you know, dramatically different data of any sort.

MR. FRANK: I, respectfully, disagree. It's my understanding that --

CHAIRMAN KATZ: Mr. Frank, you haven't even seen it yet. I haven't seen it yet. Why don't we take this up --

MR. FRANK: Just one second. It's my understanding that there will be some presentation about this model that they've developed in the field, which is certainly new information.

CHAIRMAN KATZ: But we'll all know better after we see it. Three days, huh? Okay, are we ready to swear in the witness and have the presentation?

MS. RANDELL: We actually have two witnesses to swear this morning, Albert Cretella and Dr. Gary Johnson.

CHAIRMAN KATZ: Okay. Mr. Marconi, can you take care of that.

MR. ROBERT L. MARCONI: If both --

AUDIO TECHNICIAN: Could we go off the record for a moment --

COURT REPORTER: Could we go off the record for a moment please.

(Off the record for an audio equipment check)

COURT REPORTER: We're on the record.

MR. MARCONI: Okay?

COURT REPORTER: Go ahead.

MR. MARCONI: Thank you. Now what I would ask for each witness is to state your full name, spell your name for the benefit of the court reporter, and state your position. And then after that, I'll ask both of you to rise and please raise your right hand.

MR. ALBERT W. CRETELLA: Albert -- my name is Albert W. Cretella, III. I am Project Manager for the Middletown/Norwalk Project. I work for Northeast Utilities Service Company.

MR. MARCONI: Okay.

COURT REPORTER: Spell --

MR. CRETELLA: The spelling of the name, A-l-b-e-r-t. The last name C-r-e-t-e-l-l-a.

MR. MARCONI: Thank you.

DR. GARY JOHNSON: Gary Johnson. I'm a Managing Engineer at Exponent --

COURT REPORTER: Wait --

DR. JOHNSON: I'm not coming through?

AUDIO TECHNICIAN: Move the mic closer.

DR. JOHNSON: Gary Johnson --

MR. MARCONI: Okay -- (pause) --

AUDIO TECHNICIAN: Try again please.

MR. MARCONI: Once more with feeling.

DR. JOHNSON: Dr. Gary Johnson. I'm a Managing Engineer at Exponent. The spelling of the name is Gary, G-a-r-y, Johnson, J-o-h-n-s-o-n.

MS. RANDELL: Mr. Marconi --

MR. MARCONI: Yes --

MS. RANDELL: -- we do have the curriculum vitae for Mr. Cretella here today, which we'll hand out. And Dr. Johnson's we should have before the lunch break and we can bring it back after lunch --

MR. MARCONI: If --

MS. RANDELL: -- if that's agreeable.

MR. MARCONI: If you'd like them as exhibits, you're going to want to have them identify it.

MS. RANDELL: Indeed --

MR. MARCONI: Okay --

MS. RANDELL: -- we will then.

MR. MARCONI: Okay, very good. Okay, gentlemen, if you could please rise and please raise your right hand.

(Whereupon, Dr. Gary Johnson and Albert Cretella were duly sworn in.)

MR. MARCONI: Please be seated. Okay, thank you.

(Pause, video slide presentation being set

up.)

MS. ANNE BARTOSEWICZ: Good morning. My name is Anne Bartosewicz. I'm the Project Director of the Middletown to Norwalk Project for Northeast Utilities.

Before I go into this presentation, one thing I would like to mention is what this presentation is about. And this is -- this presentation is to provide data to the Connecticut Siting Council. It doesn't presume any results of the Reliability and Operating Committee work. So, I wanted to make that clear at the beginning. We're going to walk through Cross-Sections 1 through 8 of the overhead portion to just give a base level of information. So let's -- let's start with the overview.

There are two main objectives of the presentation. The first is that we're going to talk about some strategies for reducing magnetic fields from overhead lines. And we're going to do this by walking through Cross-Sections 1 through 8. And before we actually start, what I wanted to do is give you a definition. And what I'm reading from is the legislation so we're all on the same page. And in establishing buffer zones, the legislation states that we need to take into consideration residential areas, private or public schools, licensed

child day care facilities, licensed youth camps, or public playgrounds adjacent to the proposed route of the overhead portions. And that is specifically what we're here to show you today.

On Saturday and Monday, the companies filed a set of maps to the participants. It's -- the basis of these maps is what you're going to see today. It's an aerial view, 1,000 scale, and we've identified -- we've searched out these statutory facilities for buffer zones adjacent to the proposed route and we're going to show you where they sit on the right-of-way. And then for each cross-section, we're going to walk through potential mitigation measures. Why don't you go ahead and we'll start.

There are, essentially, three strategies to reduce magnetic fields. The first one add distance. You can do that by widening the right-of-way, you can do it by increasing the pole height, or you can relocate the line. The second one is you can optimize phasing. And you can see the little structure on the bottom left there, the ABC and the CBA, that is, essentially, what the split-phase does, and it does optimize the phasing and it reduces magnetic fields.

On the third -- the third portion of this

slide shows optimization of structures. And you can see that the structure on the left is an H-frame, the one in the center is a vertical, and the one on the right is a delta configuration. And depending on cancellation effects, some structures in relation to other structures will give you either a greater or a reduced cancellation. So these are the three tools that we have available to us as we talk about mitigation.

MR. CRETELLA: Good morning. I'm Al Cretella, Project Manager for Middletown/Norwalk.

You will see a series of maps that look like this as we go through the presentation. Each map will depict a particular cross-section in the overhead portions of the line. This first cross-section runs from Scovill Rock Substation to Chestnut Junction. It's about 2.6 miles long. In this particular cross-section there are no buffer zone statutory facilities adjacent to the right-of-way. However, when we look at the cross-sections, we can see that there are measures that can be taken to reduce EMF at the right-of-way border. The configuration -- the proposed configuration shows some reduction in magnetic fields at the right-of-way border, but Options 1 and 3, from information that was previously filed on the record, show that there could be further

reductions in magnetic field at the edge of the right-of-way.

Again, this information -- the information on the left, the two aerial photos were filed with the application in one of the volumes. The little stick figures on the cross-section and the type of structures that could be used were filed originally on May 28th as part of an EMF mitigation filing. That information was slightly modified on a July filing just to correct a few of the cross-numbers associated with that. The information shown on the charts at the bottom is contained in Dr. Bailey's testimony, Exhibit 1.

So essentially all of the information that you're going to see on these slides has been filed on the record at this point in time. This is kind of a pulling together of all the various pieces of information to give a better feel for what these cross-sections are and how we can reduce EMFs along the borders of the right-of-way.

MS. BARTOSEWICZ: This is Cross-Section 2, it is in the Towns of Haddam, Durham, and Middlefield, and in Wallingford from Oxbow Junction to Beseck Substation. Along this right-of-way you see -- and you'll see on all of these aerials some designations. The R designation is a residential area. DC would be a day care. We'll see a

few others as we go along. Along this right-of-way you see R-11 and R-70. R-11 is the Royal Oak neighborhood and R-70 is Valley View Drive.

And let me just give a quick definition. The legislation provides for residential areas adjacent to the right-of-way. And in order for us to get our arms around what that meant, we came up with a way of measuring that essentially. And what we did is we looked at these maps and we said if they are within 300 feet of the right-of-way, the residential areas, for a length of about 2,000 feet, so that's a cluster of homes, a group of homes essentially, that we would identify that by one of these designations. And these designations tie to Dr. Bailey's testimony, Exhibit 2 of his testimony filed on the 19th. So every one of these facilities that we walk through are shown in Dr. Bailey's exhibit and they're shown -- all of the numbers on that bar chart are also shown.

So in this area we've got the two residential neighborhoods. And on the next slide we'll see some mitigation there. The -- Option 3 is the split-phase option. And as you can see, it shows you it's the lowest calculated value. I'll talk a bit about Option 6, because one of the things we did look at for Durham is a bypass around the Royal Oak neighborhood. And there's an

interesting point here, if you look at Option 3, if you look at the bottom, the yellow bar, and you look at the bypass, which is the blue bar on the very right-hand side, you can see that if you move the 345 structures off of the right-of-way through the neighborhood and left the 115's there, that the levels are actually higher than if you left the split-phase on the right-of-way and put the 115 underground.

So you'll see as we go through this presentation that what's on the right-of-way, what's adjacent to it, how tall the structures are, all have an effect on your magnetic field calculation. So for this -- for these two neighborhoods, if you wanted to look at the field calculation that has the lowest, you would see Option 3 provides that for you.

MR. CRETELLA: On Cross-Section 3, which runs from Black Pond Junction down to East Meriden Substation, there is one residential area abutting the right-of-way. This is the High Hill Road residential area on the east side of the right-of-way. In this particular configuration, Option 1 produces the lowest EMFs on that particular side of the right-of-way where this buffer zone statutory facility is located. It's interesting to note that obviously Option 2 would produce better results on

the west side of the right-of-way, however there are no buffer zones statutory facilities on that side of the right-of-way. Again, this is part of the tradeoff between structure design and height and EMF at the boundary of the right-of-way or at statutory facilities that must be made in order to determine what the proper configuration should be.

For this particular statutory facility, the High Hill Road residential area, under Option 1 the magnetic field at that facility, which includes the appropriate distance to that facility, is 2 milligauss as a result of Option 1. And again in this particular instance when we talk about distance to the residential area statutory facility, we are using the closest structure -- for this presentation we are using the closest structure in that residential area in order to determine the calculations. For the individual statutory facility, such as day cares, licensed youth camps, public playgrounds, we've used specific distances to those particular facilities in doing the calculations of the EMF.

MS. BARTOSEWICZ: One of the things I just want to note while we're still on this slide is these are -- this slide is essentially a calculation of a typical

cross-section. In Dr. Bailey's testimony in Exhibit 2, the statutory facilities adjacent to the right-of-way were actually -- we went out and we actually measured the distance -- so when we talk about -- when you -- when you look at these cross-sections, they're typical numbers. For all of the facilities, we've actually gone out and done a specific calculation based on the typical cross-section but with the actual distance from that facility. So as we go through the rest of this presentation, we will be providing you some numbers which appear in Dr. Bailey's testimony that may be slightly different from the ones you see on the screen because these were done for the typical cross-section, and the specific number we're giving are actually -- we actually went out and took the measurements from a specific distance. So there's -- you'll see us talk about two different numbers. Go ahead.

Cross-Section 4 is from -- in Meriden from East Meriden Substation to -- or actually East Meriden Junction to the proposed Beseck Substation. There are two facilities. The DC designation is a day care and the RO-2 is the High Hill, Sweet Birch Road neighborhood. This -- this cross-section, Option 1, provides fields obviously lower than they are today. The existing -- the blue columns are the existing fields. And Option 1 provides

the lowest cross-section option. At both the day care and the neighborhood when calculated with the appropriate distances, the milligauss reading is at 1.7.

MR. CRETELLA: Cross-Section 5 runs from Beseck Substation to the East Wallingford Junction, a distance of almost six miles. In this particular cross-section there are four buffer zone statutory facilities adjacent to the right-of-way. All four are residential areas; the High Hill Road combination, Whiskey Wind Road on the east side of the right-of-way, the south end of High Hill Road also on the east side of the right-of-way, the Williams Road area, the north part of Williams Road on the west side of the right-of-way, and the Mulligan Drive neighborhood on the east side of the right-of-way.

When we look at the options we have for reducing EMFs, we can see that the proposed actually has a slight increase in EMF at the right-of-way border. When we look at Option 6, we find that we can reduce the magnetic fields at the right-of-way border the greatest. When we look at the specific individual buffer zone residential areas, the three on the east side of the right-of-way, Option 2 would produce the lowest EMF levels for those facilities. However, when we look at the north Williams Road area on the west side of the right-of-way,

Option 6 would produce the lowest magnetic fields for that particular facility. Again, this is a tradeoff. To reduce -- to use Option 6 would mean that you'd lower on the west side, but you'd be just slightly higher than Option 2 on the east side. In this particular situation when we looked at the actual distances for these four residential buffer zone areas adjacent to the right-of-way, the range under Option 6 would be from .9 milligauss to 4.3 milligauss, again for each of those.

MS. BARTOSEWICZ: Cross-section -- and some of these cross-sections we've broken up into smaller pieces, (a) they didn't all fit on the screen, and (b) the configuration might have changed throughout the cross-section.

So this is Cross-Section 6 East. It's from East Wallingford Junction to North Haven Junction, about 1.4 miles. There is one area, a residential area at Mariot Circle. Option 3 produces -- for the residential area it produces the lowest -- the lowest magnetic field. The calculated distance for Mariot Circle is 3.7 milligauss. And that would provide the taller structure through this 1.4 miles.

A VOICE: Could you tell what Option 3 -- what that is -- (indiscernible) -- split-phasing --

(indiscernible) -- call it a structure?

MS. BARTOSEWICZ: On Option 3 --

COURT REPORTER: Whoa, wait -- you need to talk into a microphone --

A VOICE: (Indiscernible) --

MS. BARTOSEWICZ: Sure. The question was what the structure actually was doing. And let's just go back to the structure for a second -- can we go backwards? You see that Option 3 here is not a split-phase option. On this right-of-way today you have an existing 115 line. And we chose here to put the 115 and the 345 on the same structure. So in this case we used pole height to reduce the magnetic field.

Another option could have been two different structures, with the 115 on one side and the 345 on the other structure, and then you might have done a split-phasing. So there are still -- we tried to look at what we thought was going to be the best magnetic field calculation. In this particular option it's not a split-phase, it's just using the pole height to reduce the magnetic field level.

And we can identify from these structures -- and what you see on the picture -- when the davit arms are the same size, you're essentially looking at a split-

phase. When they're different sizes, you're looking at different types of circuits on either side of the pole structure.

MR. CRETELLA: Cross-Section 6 West runs from North Haven Junction to Wallingford Junction, a very short stretch, only about six-tenths of a mile. There is only one buffer zone statutory facility adjacent to the right-of-way in this cross-section. It happens to be a public playground, specifically the ballfields on South Cherry Street, which are on the south side of the right-of-way. It is our understanding, and I believe a representative of Wallingford confirmed that this morning, that these ballfields have been abandoned due to chemical contamination on the site. The rest of this -- the rest of this cross-section runs basically through an industrial area so there were no specific EMF reduction measures looked at for this particular cross-section.

MS. BARTOSEWICZ: Cross-Section 7 is two and a half miles from Wallingford Junction to the Cheshire town line. As you can see there is one residential area, Mansion Road in this area.

Option 4 produces the lowest magnetic fields for the Mansion Road area. It actually produces a 1-milligauss level at the closest structure to the right-

of-way. And if you look at the structures for Option 4, the monopole is a split-phase. The existing 115 remains and we add the 345 on a second structure with a split-phase.

MR. CRETELLA: Cross-Section 7-B is a very short cross-section, it happens to be one little leg associated with a supported change that has been filed in this docket already. That supported change would be to take the 115 -- one of the 115-kV circuits and put it underground along Old Farms Road and have a single structure on the right-of-way with a 115 and a 345 combination. This was done essentially to reduce the right-of-way clearing across the front yards of the houses along the south side of the right-of-way. This right-of-way essentially runs right along the front yards of these residences.

When we looked at the options that we had for this particular area, we see that Option 2 really produces the lowest magnetic fields at the border of the right-of-way. Again, the tradeoff in looking at these options, you can see that structure height is an important factor. Particularly for the situation in this area, the -- Option 2 produces the magnetic fields of about 1.1 milligauss for this particular residential area on the

south side. Again, Option 2 is a 130-foot tower with a split-phase 345 on it, and it would take both of the 115 circuits and put them underground along Old Farms Road.

MS. BARTOSEWICZ: Cross-Section 8-A is from Cook Hill Junction to the Hamden town line, about four-tenths of a mile. There is a residential neighborhood along Old Farms Road in this area. And in this section, Option 4 produces the lowest magnetic field value. At the closest structure the calculated value is 0.7 milligauss. It does require one of the 115's to remain underground, which as our supported change provides. It does also provide for the split-phase of the 345-kV line on a single structure.

MR. CRETELLA: Cross-Section 8 North runs from the Hamden/Cheshire town line to Glen Lake Junction, a distance of approximately 7.1 miles. We're starting to move into the much longer stretches where cross-sections would apply between somewhere in the Cook Hill Junction area all the way south to East Devon.

In this particular cross-section there is one buffer zone statutory facility adjacent to the right-of-way, it's the Darley Road residential area on the north side of the right-of-way in Hamden. In looking at the options that we have for this particular cross-section, we

find that Option 5 produces the lowest EMF -- the lowest magnetic fields at the right-of-way border. Option 5 is a taller tower than what was proposed in both cases for the 115 and the 345. It moves the 115 tower height up to 110 feet where in our proposed approach it was only at 80 feet. It moves the 345 tower up to 135 feet compared to an 85-foot tower associated with the proposal. Again, there's a tradeoff in structure height and design of the structure to reduce magnetic fields.

In this particular situation you could look at Option 4, which would produce similar types of fields at the right-of-way border and lower the structures back down to 80 and 105 feet accordingly. Again, this is a tradeoff between the magnetic fields and the structure heights. For the particular residential area, using Option 5, we end up with a 1.7 milligauss level at the buffer zone statutory facility. If we went to Option 4, which would make the towers just a little bit shorter -- I shouldn't say a little bit -- 30 feet shorter -- that EMF level -- that magnetic field level would be at 2.7 milligauss instead of the 1.7. Again, a tradeoff between EMF and the structure height.

MS. BARTOSEWICZ: Cross-Section 8, we labeled this Middle, is from Glen Lake Junction to Pease

Road Junction, approximately 2.9 miles long. There are two statutory facilities adjacent to the right-of-way here. DC-47 is the JCC, Jewish Community Center Day Care. And the one across the right-of-way on the west side, P-19, is the Jewish Community Center baseball field.

Of the two options we show here, Option 5 provides the lowest magnetic field reading. At the -- let me get this right -- at the baseball field the actual reading, the calculated reading is 0.6 milligauss, and at the JCC Day Care facility, it would be 0.3 milligauss. So as you see, Option 5 provides you the lowest magnetic field reading. And the structures here, the 345 is a split-phase here. The 115 is on its own structure. They are both taller than proposed in the application, however we get to 0.6 and 0.3 milligauss respectively.

MR. CRETELLA: Cross-Section 8 South is a pretty long stretch, it runs from Pease Road Junction down to East Devon Substation, a distance of about 12 miles. In order to show this entire cross-section, we've split it into two sections. And I'll talk about the north section of this cross-section and the south section.

In the north section, which runs through Woodbridge and Orange, there are seven buffer zone statutory facilities adjacent to the right-of-way. Again

through this area in Orange and Milford, we're seeing some of the more densely populated areas where the right-of-way goes through. There are two schools on this section, the Ezra Academy and the -- I guess it's combined with Gan Hayeled, excuse me if I pronounce it wrong, School on the east side of the right-of-way in Milford, and there is Race Brook Elementary School on the west side of the right-of-way in Orange. And again, the schools are designated with the S nomenclature in our mapping.

In addition to that there are five residential areas. There is one in Woodbridge and there is four in Orange. On the east side of the right-of-way we have the Salem Road neighborhood and the Dogwood Road neighborhood. On the west side of the right-of-way, the Bittersweet Road neighborhood, the Overland Drive neighborhood, and the South Race Brook Road neighborhood.

In the southern section of this Cross-Section 8, which basically finishes up Orange and runs in Milford down to the proposed East Devon Substation, there are 11 buffer zone statutory facilities adjacent to the right-of-way. We have one licensed day care facility at the Orange High Plains Community Center, which is on the west side of the right-of-way. We have two public playgrounds, one at the Orange High Plains Community

Center and one at Eisenhower Park ballfields in Milford. In addition, there are eight buffer zone statutory residential areas adjacent to the right-of-way, four in Orange and four in Milford. There are three on the west side and five on the east side of the right-of-way. Again, a very densely populated stretch of the right-of-way.

When we look at the specific configurations and options we have, Option 5 produces the lowest calculated fields at the right-of-way border, in the areas of 2.9 milligauss and .6 milligauss. Again, Option 5 is a split-phase design for the 345. It is on a 135-foot structure as compared to an 85-foot structure which was in our proposal. The 115 lines would be on a 110-foot structure as compared to an 80-foot structure in our proposal.

For these particular buffer zone statutory facilities, the Option 5 results produce a zero magnetic field at the Race Brook Elementary School and they produce a .5 milligauss field at the Ezra Academy facility.

For the residential areas along this right-of-way, Option 5 -- for the ones on the west side of the right-of-way, Option 5 produces fields that range from 2.3 to 2.9 milligauss for the residential statutory facilities

on the west. And on the east side of the right-of-way, which happens to be a little bit better than the west for EMF fields -- or magnetic fields, excuse me -- the residences along the -- the seven residential areas along the east side of the right-of-way would see field levels from .4 to .6 milligauss.

MS. BARTOSEWICZ: I just -- two final comments. That's the end of this piece of the presentation. I want everyone to note that the calculated values displayed on these slides are based on the 15-gigawatt average New England load case and are included again in Dr. Bailey's testimony.

And the last comment is for those who came in in the middle, I want to make sure we all understand this does not presume the results of the Reliability and Operating Committee, that this is information for the Council based on EMF mitigation along the overhead proposed route. Thank you. I think --

CHAIRMAN KATZ: Before we go to the next presentation, Mr. Smith of Wallingford Utilities is just going to make a clarification on the ballfields.

MS. BARTOSEWICZ: Sure.

COURT REPORTER: State your name and spell it please.

MR. RAYMOND SMITH: Raymond Smith, Director of Public Utilities for the Town of Wallingford.

In Cross-Section 6, Mr. Cretella referenced the closing down of the ballfields. That was not because of chemical contamination. I just want to set the record straight on that. Thank you.

MR. CRETELLA: My apologies.

COURT REPORTER: One moment please. (Pause). Thank you.

MS. BARTOSEWICZ: I just want to introduce the next part of the presentation. Dr. Bailey has provided us with a video that he had produced regarding split-phase. And I believe Dr. Gary Johnson is going to run this for us.

(Pause)

DR. WILLIAM BAILEY: By way of introduction, questions have been asked about the design of a transmission line in the so-called split-phase configuration and the reduction in magnetic fields that are achieved. We -- though the assistance of Northeast Utilities and UI, we identified a -- we have provided a model of the split-phase design and produced a video tape of it that exemplifies the measurements of the magnetic fields we made of a standard three-wire line and a split-

phase line with six wires, and then with the optimal configuration sometimes of the phasing sometimes referred to as a reversed phase split-phase design. So with that, we'll start the video. And at a couple of points, we'll stop to comment on it. Gary.

(Audio Video played)

DR. BAILEY: I'd just like to stop here to comment that for each of the three demonstrations we're going to do, we're going to be measuring the current coming from the building into the -- that were then distributed into the model to make sure that those currents have not changed between the three examples. And you shall see as we go through the video, they're all around 19.3 amps on each of the three wires coming into the phases.

(Audio Video played)

DR. BAILEY: Just -- just one comment here. We only had three recording magnetic field meters. So in the video what we showed are the measurements made with those three meters. We also took later when -- after we completed the demonstrations, we took an additional measurement further away, a fourth measurement further away that was not recorded in the video tape because we wanted to show how the fields fell off further with

distance from the line. Continue, Gary.

(Audio Video played)

DR. BAILEY: Stop.

(Audio Video played)

DR. BAILEY: Just to comment, this -- what we've now done is taken the currents that were applied to three wires at 19.3 amps of current approximately and now it's been distributed to six wires, and they're in the ABC, ABC configuration.

CHAIRMAN KATZ: Dr. Bailey, less hands -- closer to --

DR. BAILEY: Thank you --

CHAIRMAN KATZ: -- more mic --

DR. BAILEY: Continue.

(Audio Video played)

DR. BAILEY: Here we're taking that 19.3 amps of current and dividing that current from each phase conductor. Each of those three wires was measured. The current from one of those wires is now being distributed to two wires on the transmission line, one on one side of the model and one on the other.

(Audio Video played)

DR. BAILEY: Stop, Gary. Here we see the blue dots illustrating the measured magnetic fields during

this experiment and the solid line shows the calculated field levels. And as you can see, there's a good agreement for those measured and calculated points. Continue.

(Audio Video played)

DR. BAILEY: Stop. Here we are showing the Phases ABC on the left-hand side of the model and we just had measured the fields with the right-hand phases, right-hand conductors phase ABC. Now to optimize the phasing, we want to reverse that. Essentially, we want the phase that was previously at the bottom conductor in the previous model as shown by the purple arrow to be connected to the top wire on the right, and we want the Phase A that was previously connected to the top conductor to now be presented to the bottom conductor. So you can see if you look across the model, looking across the top, you would have then A balanced by C at the top, the B phase is -- do not change on either side. And then the C phase is balanced by the A phase at the bottom.

(Audio Video played)

DR. BAILEY: Now what we're going to do is we've gone through three different experiments. One is measuring the fields from the three-wire vertical configuration. Next we took measurements from the six-

wire split-phase configuration. And third, we measured fields from the optimized split-phase line. Throughout these experiments the same amount of power was delivered to the circuits whether -- no matter what configuration they were in, it was about 19.3 amps per phase averaged over the whole experiments. So in the next graph we're going to show what the results are in comparison of these three line designs and the effect on magnetic fields.

(Audio Video played)

DR. BAILEY: You can see the top profile shows the highest magnetic fields measured just a little over -- by predicted, a little over 80 milligauss. At the point we measured near the center of the conductors, it was about 70 milligauss. And you can see that the magnetic field from the three-wire vertical line falls off on either side of the conductors with distance.

Then we go to the green line, which shows the magnetic field calculated for the six-wire split-phase line, and you can see just distributing the current through six conductors instead of three conductors results in a lower magnetic field. And those values are in agreement with our measurements.

And then finally, we optimized the phasing of the split-phase configuration to be ABC on the left and

CBA on the right. And you can see still lower magnetic fields are produced by this design, lower than the previous designs we showed. It becomes particularly evident as you go further away from the conductors.

(Audio Video played)

(Audio Video ends)

CHAIRMAN KATZ: We're going to take a five-minute break. When we come back, Mr. Frank, I am -- having seen the presentations, I am sympathetic now to the point that this is new evidence. So while we'll have cross-examination on this today, I am going to allow parties and intervenors to come back to this at a later time of these witnesses.

So we'll resume in five minutes with cross-examination of the panel, but before you stand up, Attorney Larry Golden is seriously ill and I just ask that everyone please keep him in your thoughts and prayers. And we'll resume in five minutes.

(Whereupon, a short recess was taken.)

CHAIRMAN KATZ: We're going to resume. At this point, we have certain Applicants' exhibits which must be verified. So we'll go to page 17 of the hearing program, Mr. Fitzgerald, and go from there.

MR. ANTHONY FITZGERALD: Yes, thank you.

The first highlighted item is the update of Exhibit 113 --

A VOICE: No --

MR. FITZGERALD: No?

A VOICE: 96 --

MR. FITZGERALD: I'm sorry. The first item is -- on page 17, Item 96, the revision of the May 28th exhibits, EMF mitigation for all sections. That was updated and submitted on July 21st with a cover letter explaining the changes. And do you have any further changes to that, Dr. Bailey?

DR. BAILEY: No, I -- (indiscernible) --

COURT REPORTER: Again, Dr. Bailey.

DR. BAILEY: No, I do not.

MR. FITZGERALD: So, Dr. Bailey, do you adopt revised Exhibit 96, dated July 21, 2004 as part of your testimony and as sponsored as true and correct to the best of your knowledge?

DR. BAILEY: Yes.

MR. FITZGERALD: Now, the next item on page 18 is No. 113, there isn't -- the exhibit is identified as an updated Calculation of Fault Rate Data for XLPE Circuits. The transcript discloses that this exhibit is a presentation in exhibit form of the information to which Mr. Gregory testified while he was here. And we would --

we would ask that that exhibit be admitted just as a record of information given under oath already and not -- that we not be required to bring Mr. Gregory back from England to verify that.

CHAIRMAN KATZ: Is there any objection to making 113 a full exhibit based on that explanation? Hearing none, we'll do that.

(Whereupon, Applicant Exhibit No. 113 was admitted into evidence as a full exhibit.)

MR. FITZGERALD: And I -- you're asking that question reminds me that I -- that I did not ask that Exhibit 96 be admitted as a full exhibit.

CHAIRMAN KATZ: Well, I thought we'd do those collectively --

MR. FITZGERALD: Okay, fine.

CHAIRMAN KATZ: -- because I think Dr. Bailey had other things in here.

MR. FITZGERALD: Yes, yes. And there are other witnesses that do to. Well, maybe I ought to run through all of Dr. Bailey's exhibits then, and then we'll come back --

CHAIRMAN KATZ: Okay, why don't we do that --

MR. FITZGERALD: -- then we'll come back

and start again at the top with the next -- Dr. Bailey, I think the next thing that we have for you is on page 19, and -- and hopefully, everybody can follow this -- there's a small "a" on the top of the page and then there's a small "a" under No. 124. Those -- those two exhibits are actually the same thing, okay. This is a document entitled Exhibit 2 that is referenced in Dr. Bailey's supplemental testimony of July 19th, but was not prepared in time to be filed on July 19th, it was filed on July 23rd. And in addition, I believe, Dr. Bailey, that you have a correction to that exhibit and have -- and that we have with us today copies of the corrected exhibit, is that right?

DR. BAILEY: Yes.

MR. FITZGERALD: Would -- would you please identify -- well, actually first why don't we pass out the corrected exhibit and then you can identify the correction. And this will be served -- has this already been served --

A VOICE: No --

MR. FITZGERALD: -- or it will be served today -- okay. And we have -- we have copies for people in the audience who want one.

CHAIRMAN KATZ: We'll go off the record for

a moment while we pass that out.

(Off the record)

MR. FITZGERALD: Now, Dr. Bailey, first of all, would you please identify what changes have been made in this document, which I'm going to call revised Exhibit 124-A, as compared with the document that has previously been marked 124-A?

DR. BAILEY: Certainly. The changes occur in two columns. First, the Low Field Option A column. And in the first two rows of the table, the values were previously under -- for facility R-11 4.3 milligauss and R-70 4.3 milligauss. The wrong values were pulled from the file in making up this table. And those values under peak load should be 18.5 milligauss for low option -- Field Option A at R-11 and 18.5 milligauss for Low Field Option A Peak Loading at R-70.

The same kind of error is found on those same two rows under Low Field Option C under Peak Loading, the values for R-11 and R-70 previously were both 18.5 milligauss, and they have been corrected in the updated exhibit to 23.1 milligauss at each facility.

MR. FITZGERALD: Alright. Now, Dr. Bailey, so we can identify which -- what you're sponsoring in this exhibit, is it the case that the locations and the

categorization of the locations that appear on the left-hand side of the page were provided to you by the companies?

DR. BAILEY: That's correct.

MR. FITZGERALD: And then you -- you took that information and then applied the loading information and conductor positioning information that you previously had obtained from the companies and used in preparing earlier exhibits, and you used that information to calculate the magnetic field values that are displayed on the page?

DR. BAILEY: Yes, we did.

MR. FITZGERALD: Now, let me go to you, Miss Bartosewicz, and ask you whether the listing of the statutory facilities was developed by the companies using the GIS information, using lists of the licensed facilities that were obtained from the State, using in some instances drive-bys, and with respect to the residential area designations in the absence of more specific guidance from the Council for which there's no opportunity yet, using the rule of thumb definition that you described during your presentation?

MS. BARTOSEWICZ: That's correct.

MR. FITZGERALD: And is the information on

this exhibit, Dr. Bailey and Miss Bartosewicz, accurate as representing what it purports to represent to the best of your knowledge and belief?

MS. BARTOSEWICZ: Yes, it does.

MR. FITZGERALD: Dr. Bailey?

DR. BAILEY: We also have --

MR. FITZGERALD: Well, no, no -- we're just --

DR. BAILEY: Yes --

MR. FITZGERALD: Before we get to the next exhibit --

DR. BAILEY: Sure.

MR. FITZGERALD: Okay. That's -- that's Exhibit 2. Alright -- Exhibit 2 to your testimony. Alright, now we'll go back to the Bailey testimony and Exhibit 1 to the Bailey testimony --

CHAIRMAN KATZ: Mr. Fitzgerald, I'm going to ask you to refer to the numbers --

MR. FITZGERALD: Yes --

CHAIRMAN KATZ: -- on the hearing program.

MR. FITZGERALD: Thank you. Let me return now to what has been marked as Exhibit 124, the Supplemental Testimony of Dr. Bailey. Apart from Exhibit 2, which we've just discussed, do you have any corrections

to make to that testimony or to the other exhibit to it?

DR. BAILEY: Yes, I do.

MR. FITZGERALD: And what is that?

DR. BAILEY: On turning to page 5 of the testimony, about three-quarters down the page, the response reads yes in Cross-Section 2, in parentheses, (Design Options 2 and 3), and 7-B (Design Option 1) in parentheses --

MR. FITZGERALD: Yes --

DR. BAILEY: -- that should read Design Options, plural, 1 and 2.

MR. FITZGERALD: Okay. We will file an errata sheet in due course for that. Did you have --

DR. BAILEY: I -- I also have another --

MR. FITZGERALD: Oh, okay --

DR. BAILEY: -- correction. On page 9 of Exhibit 1, that's the Cross-Section 5 15-gigawatt case, at the top there is a heading on the table on the right-hand side that gives distances, it's in error. The distances given are in 10-foot intervals and they should be in 15-foot intervals starting at 15 feet from the edge of the right-of-way and going out to 150 feet from the edge of the right-of-way as it is on the left-hand side of the page.

MR. FITZGERALD: And it's that way in all the other pages of the exhibit too, isn't it --

DR. BAILEY: That's correct --

MR. FITZGERALD: -- 15-foot intervals. Somehow this one got labeled with 10-foot intervals. Alright. Well, we will submit an errata sheet for that as well. Are you keeping track of these --

A VOICE: Yes.

MR. FITZGERALD: Okay. Dr. Bailey, with those corrections, is exhibit -- do you adopt Exhibit 124 as your testimony and aver that it is true and correct to the best of your knowledge and belief?

DR. BAILEY: Yes, I do.

MR. FITZGERALD: That, I believe, is all that we have from Dr. Bailey.

CHAIRMAN KATZ: Why don't I ask at this point if there are any objections to making those full exhibits? Seeing none, we will take Dr. Bailey's things as full exhibits.

(Whereupon, Applicants' Exhibit No. 96 and No. 124 were received into evidence as full exhibits.)

CHAIRMAN KATZ: And his presentation this morning, when are we getting a hard copy of that?

MR. FITZGERALD: We don't -- we hope to

have it reproduced before the end of the day.

CHAIRMAN KATZ: Okay. So --

MR. FITZGERALD: Both -- both that and to have CD's of the video presentation.

CHAIRMAN KATZ: Okay. And then we'll verify that when it comes in?

MR. FITZGERALD: I think that would probably be --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- the better way.

CHAIRMAN KATZ: Okay.

MR. PHILIP T. ASHTON: Mr. Fitzgerald, forgive me, I got lost on the last correction that Mr. -- that Dr. Bailey gave, and that's the chart, Exhibit 1. And I apologize.

MR. FITZGERALD: It's page -- go to page 9 of 26 --

MR. ASHTON: That's the first chart behind it?

MR. FITZGERALD: Yes.

A VOICE: This one --

MR. FITZGERALD: Well, it's -- yeah, right. And if you -- page 9 of 26 should be captioned Cross-Section 5, typical segment --

MR. ASHTON: I have Cross-Section 1. Cross-Section 5?

MR. FITZGERALD: Yeah.

MR. ASHTON: Okay, I'll go to the back of that --

MR. FITZGERALD: Page 9 of 26.

DR. BAILEY: It should like this.

CHAIRMAN KATZ: You're looking at --

MR. ASHTON: Cross-Section 5 -- I'm sorry -- oh, yeah, I see the 10, 20, 30, 40, 50, they should be corrected to 15-foot intervals?

MR. FITZGERALD: Right.

DR. BAILEY: Yes.

MR. ASHTON: So 15, 30, 45, etcetera?

DR. BAILEY: Yes.

MR. ASHTON: Thank you. I missed -- when you said -- I found typed numbered page 8 and then I got lost.

MR. FITZGERALD: Now, I think we go back at this point to page 18 and the next shaded exhibit is 114. However, I believe if you check with the transcript, we will find that Exhibit 114 was admitted as a full exhibit on June 17th, page 242 of the transcript, sponsored by Mr. Walling, and that at the time there was only one copy

available, but it has since been filed and served in the normal course.

CHAIRMAN KATZ: We will note that subject to check.

MR. FITZGERALD: Now, let's start with Mr. Zaklukiewicz. Exhibit -- Exhibit 115, the Middletown/Norwalk Project Steering Committee Process, that is a memorandum describing the -- what is come -- since come to be known as the Reliability and Operating Committee, or the ROC group, and -- exhibit. So, I'd just like you to note that, Mr. Zak, and keep it in mind.

We'll move on now, Exhibits 116 and 117 are interrogatory responses.

Exhibits 118 and 119 are reports prepared for the so-called ROC group by GE. And with respect to those reports, Mr. Zak, I will be asking you to verify simply that they are reports that you have received and understand from GE to be correct and that they've been distributed as part of the work of the ROC group.

Exhibit 120 is another set of interrogatory responses.

I'm going to skip 121. Exhibit 122 is the first biweekly report of the ROC group.

Exhibit 123 is your testimony concerning

potential use of HVDC, dated July 19th, with attached exhibit. Please note that that Sub A underneath 123 on the program should not be there.

Moving now to Exhibit 125, the Thermal and Voltage Analysis of Case 6, that was prepared for the ROC group.

And now I'm going to skip to Exhibit 131, Addendum No. 4 to the supplemental filing, which is a load flow study relating to the East Shore Alternative.

Mr. Zaklukiewicz, are all of those exhibits true and correct to the best of your knowledge and do you adopt them as your testimony?

MR. ROGER ZAKLUKIEWICZ: Yes, I do.

MR. FITZGERALD: I offer them as full exhibits.

CHAIRMAN KATZ: Any objection to making them full exhibits? Hearing none, they're full exhibits.

(Whereupon, Applicants' Exhibits Nos. 115, 116, 117, 118, 119, 120, 122, 123, 125 and 131 were received into evidence as full exhibits.)

MR. FITZGERALD: Alright. Now, going back again to the top, I have some exhibits to be sponsored by Miss Bartosewicz. The top at this point is Exhibit 121, a letter to the Honorable Maryann Boord regarding

constructability of routes in Durham.

The next would be Exhibit 127, which is a letter from Brian Henebry regarding CL&P's or the Applicants' preferred routes. It's kind of a borderline thing, but there is some factual matter in there, so I'm going to ask Miss Bartosewicz to adopt that as her testimony.

And then the next item would be 130, the wetland map and cover letter for the project, Sections 1 and 2, that responded to a homework assignment.

And the -- let me -- let me just ask the witness a couple of questions about the final item, which is the map satisfying the requirement of the amended statute. That map was prepared on the same basis as the facilities that were listed in Dr. Bailey's Exhibit 2, correct? In other words, you used the GIS to identify residential areas? And for the licensed facilities you used State -- lists obtained from the State of the relevant licensed facilities?

MS. BARTOSEWICZ: That's correct.

MR. FITZGERALD: Alright. And -- and then some drive-bys and whatever other pertinent information you could gather --

MS. BARTOSEWICZ: Yes --

MR. FITZGERALD: -- is that right?

MS. BARTOSEWICZ: -- that's correct.

MR. FITZGERALD: And -- so that's a -- does that represent a best efforts product?

MS. BARTOSEWICZ: Yes, it does.

MR. FITZGERALD: Okay. Now with those qualifications, would you adopt the exhibits we have just identified as being true and correct to the best of your knowledge and sponsor them as your testimony?

MS. BARTOSEWICZ: Yes, I do.

MR. FITZGERALD: I offer them as full exhibits.

CHAIRMAN KATZ: Any objection to making them full exhibits? Hearing none, we'll make them full exhibits.

(Whereupon, Applicants' Exhibits Nos. 121, 127, 130 and 132 were received into evidence as full exhibits.)

MR. FITZGERALD: Now, the only remaining items on the list, I believe, are briefs. 126, it's our brief concerning the municipality notice issues.

128 -- I'm sorry -- no, 128 has been -- yes -- no, 128, which is a response -- although it's an interrogatory response, it's a legal position that

concerns our position with respect to the intent of the buffer zone determination and how you should go about establishing buffer zones.

129 is our brief on the remaining provisions of Public Act 04-246, apart from the buffer zone provision.

And I would submit that while we list it as exhibits, it would be inappropriate to --

CHAIRMAN KATZ: We will remove them from the exhibit list, indicating that 126, 128 and 129 are briefs. And while 126 is called a brief, some of the other ones are called responses and comments. And I ask the Applicants and all parties and intervenors to use the word brief in the title so that these things don't --

MR. FITZGERALD: Okay --

CHAIRMAN KATZ: -- are not confused.

MR. FITZGERALD: Good suggestion, okay. That's all that I have.

CHAIRMAN KATZ: Okay. I believe we've covered the hearing program.

I have a request. In this morning's audio visual presentation, the Applicant made certain assumptions on what things were in the statutory buffer zone and what were not. I'd like to have that in writing.

It's part of the presentation that we'll be getting later, hard copies of?

MR. FITZGERALD: Well, that -- that is in Exhibit 2 to Dr. Bailey's testimony --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- that was just passed out --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- there's a list.

CHAIRMAN KATZ: There's a list -- no, I'm saying -- for example, the testimony during the audio visual was that certain residential areas had to be of a certain size --

MR. FITZGERALD: Oh --

CHAIRMAN KATZ: -- to be included --

MR. FITZGERALD: Oh, oh --

CHAIRMAN KATZ: -- and single residential areas were not included --

MR. FITZGERALD: Correct --

CHAIRMAN KATZ: -- that type of thing I'd like -- if that's in writing somewhere, because we're going to want to ask questions about that.

MR. FITZGERALD: Yes, it is in writing in the July 26, 2004 cover letter that accompanied the maps.

And it should be, I believe, included as part of Exhibit 132.

CHAIRMAN KATZ: 132. Fine, thank you. Also in this morning's audio visual presentation certain options were discussed, again a balancing act between perhaps higher towers and less EMF or shorter towers and a little more EMF. Again, I ask the Towns to -- if they have a preference for a certain option under EMF mitigation in that balancing act, to please also indicate that to the Council. That would be helpful.

MR. FITZGERALD: And just for the Council's information, the cover letter submitting the earlier exhibit -- I think it would have been 96 -- from which that information was drawn that was used in the presentation, contains the information that I believe two towns specified structures that they wanted used --

CHAIRMAN KATZ: Yes --

MR. FITZGERALD: -- or configurations that they wanted used for this purpose, in those cases that's what was put in the exhibit. In the other cases where the Towns did not specify anything, the Applicants made a choice themselves of what looked like the optimal two potential options.

CHAIRMAN KATZ: Right, thank you. But I

just want to give the Towns another chance having seen this presentation this morning to weigh in.

And just one other clarification before we get to cross-examination. Is the jog around Royal Oaks now a company supported change, and -- because you mentioned it as part of your presentation this morning?

MS. BARTOSEWICZ: I think we mentioned it as part of the presentation this morning in an effort to show other alternatives because that was one that we responded to the Town of Durham on. So it was in there so you could see the difference between what moving the 345 around the neighborhood and leaving the 115 on the right-of-way would do.

MR. FITZGERALD: But the question is -- the question is, is this something that the company is sponsoring or proposing at this point?

MS. BARTOSEWICZ: Certainly -- yes.

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: Wait --

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: So --

MR. FITZGERALD: Wait a minute --

CHAIRMAN KATZ: Do you want a moment off the record?

MR. FITZGERALD: Yeah, could we.

CHAIRMAN KATZ: Off the record.

(Off the record.

CHAIRMAN KATZ: Are you ready to go back on the record? Yes. Okay, my question was -- when we were doing especially Segments 3 and 4, we were talking about supported changes. And the company sort of endorsed well this is now a supported change. So the question comes back to the jog around Royal Oaks, is this now a company supported change?

MS. BARTOSEWICZ: If the Town would like it, we would support it.

CHAIRMAN KATZ: Okay. Understood. Okay, at this point, I think we're ready for cross-examination of the panel. Is there anything else we need to cover?

First on the list is Representative Adinolfi, but according to my notes, he's indicated that he would like to cross on Wednesday afternoon and on Thursday. Is that still true, Representative?

REPRESENTATIVE AL ADINOLFI:

(Indiscernible) --

CHAIRMAN KATZ: Mr. -- Representative, we're going to need you to come to a mic unless you're going to say more than yes or no. (Pause).

Representative, you know, you can cross --

REPRESENTATIVE ADINOLFI: I would -- based on what I heard this morning, I did come up with a few questions I would like to ask.

CHAIRMAN KATZ: Okay. Could you have a seat and we'll start with you. And then, Mr. Knapp, you're going to follow Representative Adinolfi.

REPRESENTATIVE ADINOLFI: Is this on? Yeah.

MR. FITZGERALD: Madam -- Madam Chairman.

CHAIRMAN KATZ: Yes.

MR. FITZGERALD: Just in case there are other requests of this nature, Dr. Bailey will be here through 3:00 o'clock tomorrow.

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: This is -- we'd planned on today as being the EMF day --

CHAIRMAN KATZ: Right. We will keep that in mind, thank you.

REPRESENTATIVE ADINOLFI: My questions will be specific to the previous presentation.

CHAIRMAN KATZ: Okay.

REPRESENTATIVE ADINOLFI: Do we have any background on the reliability for split-phase? Can

anybody answer that?

MR. FITZGERALD: Well, could I just ask what he means by -- you mean the --

REPRESENTATIVE ADINOLFI: Well, where's it being used --

MR. FITZGERALD: -- does it work electrically or --

REPRESENTATIVE ADINOLFI: -- what's the history? How reliable is it compared to --

CHAIRMAN KATZ: Has it been used in Connecticut? Has it been used elsewhere? And where it's been, how reliable has it been to achieving the goals set out? How does that sound for --

MR. FITZGERALD: Very good, thank you.

DR. JOHNSON: As far as its being used --

CHAIRMAN KATZ: Since -- since you're new, we're going to ask you to sort of start off with your name this morning, okay.

DR. JOHNSON: Dr. Gary Johnson with Exponent.

With regards to the optimized split-phase, it has been used and has been in use we have found by a utility in New York State. And as far as its reliability, it would be very similar in performance to, essentially, a

double-circuit line. It's basically configured as a six-wire system, very similar to what we would call a double-circuit line with three wires on one side, three wires on the other. And it has been in use, as I said, in the State of New York for one segment. The line in there at 115-kV I believe.

CHAIRMAN KATZ: Did the reality meet the calculations for reduction in EMFs?

DR. JOHNSON: Yes, very good. The split-phased line does show a reduction in the EMF levels and matches the calculated levels quite well.

REPRESENTATIVE ADINOLFI: Alright. Does the -- is the split-phase still considered 345-kV?

MR. ZAKLUKIEWICZ: Yes.

REPRESENTATIVE ADINOLFI: Thank you. My next question is -- I'm going to ask a question I asked three months ago, why are we discussing mitigating factors in evidence when we haven't presented any reason why undergrounding will not work, it is not feasible? We're putting the cart before the horse again. And I think the legislation was clear on that.

CHAIRMAN KATZ: Well, I -- I'm going to just say something, Representative. They're here answering these questions because we're making them answer

these questions at this time. We will be taking up undergrounding Thursday on the DC basis. And we're also going to be taking up undergrounding when KEMA, our consultant, completes their work. But, you know, we've asked them to answer these questions if part of it still remains overhead, and I -- frankly, I can't fault them for presenting this information at this time because they're here because we told them to be here.

REPRESENTATIVE ADINOLFI: Thank you. Why are we using average loads and not maximum loads of worse conditions? With my background in engineering, we always used maximum loads for any calculations we did, always worst case analysis, not average or best.

MR. ZAKLUKIEWICZ: The 15 gigawatt case basically, as testified to at previous meetings, was the -- basically the loading at which at any given time 50 percent of the flows on the lines will be less than the 15-gigawatt case. And approximately 50 percent of the hours in a given year, those numbers will be higher than the 15-gigawatt case. I think we also stated that in the extreme max conditions, we're talking hours a year basically during the peak load periods on a given extremely hot summer day, which would be a three or four or five-hour period, could possibly reoccur during a

prolonged heat spell. But the 15-gigawatt case represents -- is representative of what would be experienced on -- directly beneath the line at the edge of the right-of-way or at some location away from the transmission line.

REPRESENTATIVE ADINOLFI: Thank you. Let me re-ask that question then, can we get numbers for the EMF levels and the worst case?

CHAIRMAN KATZ: That being the 27-gigawatt case.

A VOICE: Yeah, but which -- which --

DR. BAILEY: Those -- those values have already been provided in the exhibits.

CHAIRMAN KATZ: Could you just point the Representative to a certain exhibit that would be helpful to him.

A VOICE: Which exhibit --

(Pause)

DR. BAILEY: If you go to updated Exhibit 2 for the statutory facilities, those have values at both the average and peak load, that is the 15-gigawatt and the 27.7 gigawatt.

CHAIRMAN KATZ: Mr. Fitzgerald, in the hearing program, what number is that?

MR. ZAKLUKIEWICZ: That's No. 124.

CHAIRMAN KATZ: Thank you.

MR. FITZGERALD: But there's also -- there's also other information --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- in the record besides that that deals with the -- I believe with the --

CHAIRMAN KATZ: With the 27-gigawatt case?

MR. FITZGERALD: With the peak -- with the peak loads.

CHAIRMAN KATZ: Yeah.

MR. FITZGERALD: Exhibit -- Exhibit 1 to Dr. Bailey's testimony, again 124-A, that shows -- that shows by cross-section, edge of right-of-way values by cross-section with proposed and then the two mitigation options. It gives the results for both the 15-gig load and the 27.7 gig peak load. And then for the calculations that go beyond the edge of the right-of-way to the statutory facilities, you look to Exhibit 2 for that information, again both average and peak load information calculations are provided.

CHAIRMAN KATZ: Thank you.

REPRESENTATIVE ADINOLFI: One other question and then I'm done. On Cook Hill Junction, people getting to their homes have to drive under these wires.

They're going across their driveways and the children play out there and so on. Has anything been done along -- or any plans to either posting this or fencing in these lines so people and children can't inadvertently be exposed to the EMF levels by getting closer than whatever number of feet you come up with as the safety buffer zone?

MR. ZAKLUKIEWICZ: Are we speaking about fencing the right-of-way? Because as I understand it now the driveways -- I mean do you want us to fence off driveways --

REPRESENTATIVE ADINOLFI: I asked a question --

MR. ZAKLUKIEWICZ: -- or access --

REPRESENTATIVE ADINOLFI: -- I didn't say --

CHAIRMAN KATZ: One at a time --

REPRESENTATIVE ADINOLFI: -- I wanted you to do it.

MR. ZAKLUKIEWICZ: If -- if somehow some kind of markings at the end of this right-of-way are appropriate, we would so advise the people who own the properties adjacent to this transmission easement.

REPRESENTATIVE ADINOLFI: In other words, if we had posted the property, we would say something like

if you're playing under these wires for more than two hours, you are risking your health?

A VOICE: No --

CHAIRMAN KATZ: I think we'll go there in the D&M plan, Representative.

REPRESENTATIVE ADINOLFI: Okay. I'm done.

CHAIRMAN KATZ: Thank you. And -- and we do invite you back Thursday when we're going to be talking about DC and this fall when we're going to be talking more about undergrounding.

This is a good point to break. At 1:00 o'clock the Council will resume with Attorney Knapp, followed by attorneys for the Towns. And if I'm not back by 1:00, the Vice Chairman will carry on promptly at 1:00 o'clock. If I don't come back, then he'll carry on even longer. Okay, so we are adjourned until 1:00 o'clock.

(Whereupon, a luncheon recess was taken.)

CHAIRMAN KATZ: On the record. Mr. Fitzgerald, I understand we have some administrative things to do?

MR. FITZGERALD: Yes, Madam Chairman. We do have -- three of the four exhibits that were promised this morning have been duplicated so far and I would like to offer them. The first two are the resumes of the new

witnesses, Mr. Cretella and Dr. Johnson. And we will hand up the requisite original and 20 copies. We'll also serve a copy by mail today, and there are some extra copies for people in the room who might want them.

CHAIRMAN KATZ: Okay. And do you just want to have those witnesses verify those.

MR. FITZGERALD: Certainly.

CHAIRMAN KATZ: And we'll give them numbers -- Mr. Cunliffe, do we have numbers? Do we have Mr. Cunliffe?

MR. FITZGERALD: Yeah, he's at the other end of the table.

CHAIRMAN KATZ: Just wait a second. (Pause). Fred, we need numbers?

MR. FRED O. CUNLIFFE: 133, Chairman.

CHAIRMAN KATZ: Yes. Mr. Cretella is 133 and Dr. Johnson is 134, or vice versa?

MR. CUNLIFFE: Cretella is 133. Mr. Johnson 134. And do we have a CD video? Is that --

CHAIRMAN KATZ: And the CD is --

MR. FITZGERALD: The next -- the next item is a CD -- or a D -- I think it's a DVD -- a DVD of the presentation Dr. Bailey made today about split-phasing. And our proposal on how to handle that is as follows. Mr.

Cunliffe has advised that the Council would like four and treat it as a bulk file, we'll give the Council four. We will serve on the service list a notice of filing and that will advise that if any party or intervenor would like a copy, we will mail the CD to them. It can't -- it's too big to be e-mailed, but if they submit an e-mail request, we will mail one to them. We also have some, like 15 or so here today if any of the parties -- if any of the people on the service list are here today and want to get their copy handed to them and be checked off on the service list, Betty -- Miss Betty Hoyt from NU will be here and will have them and will check them off as long as they last.

CHAIRMAN KATZ: If we put this on the Siting Council website, is this the type of file that could be downloaded and viewed with appropriate Windows media software?

MR. FITZGERALD: If you have a lot of memory.

CHAIRMAN KATZ: Oh, never mind.

A VOICE: Yeah, it's a video.

CHAIRMAN KATZ: Yeah, okay. Okay, is there any objection to the handling of that exhibit? What are we calling -- and the CD we're calling 135?

MR. CUNLIFFE: Correct.

CHAIRMAN KATZ: Okay --

A VOICE: A DVD.

CHAIRMAN KATZ: The DVD --

MR. CUNLIFFE: The DVD --

CHAIRMAN KATZ: -- is 135. Okay, Mr. Fitzgerald, if we could just get those verified.

MR. FITZGERALD: Dr. Johnson, do you verify that the curriculum vitae related to you that has been submitted is true and correct?

DR. JOHNSON: Yes, I do --

AUDIO TECHNICIAN: Grab a mic --

COURT REPORTER: Once again please, doctor.

DR. JOHNSON: Yes, I do --

COURT REPORTER: Once again, doctor.

DR. JOHNSON: Yes, I do.

AUDIO TECHNICIAN: I apologize.

MR. FITZGERALD: Mr. Cretella, do you verify that the curriculum vitae that has been submitted with respect to you is true and correct?

MR. CRETELLA: Yes, I do.

MR. FITZGERALD: And Dr. Bailey, is the DVD that has been submitted a true copy of the DVD that was played today about which you already testified?

DR. BAILEY: Yes, it is.

MR. FITZGERALD: I offer those three exhibits --

CHAIRMAN KATZ: Any --

MR. FITZGERALD: -- as full exhibits.

CHAIRMAN KATZ: Any objection to making them full exhibits? Hearing none, they'll be full exhibits.

(Whereupon, Applicants' Exhibits Nos. 133, 134 and 135 were received into evidence as full exhibits.)

CHAIRMAN KATZ: And I understand by the end of the day we'll get that last one and we'll take care of it at our final procedural --

MR. FITZGERALD: We're -- we're hoping. It's a big color -- a lot of color copying. It's underway. We're hopeful we'll have it by the end of the day.

CHAIRMAN KATZ: Okay. Okay, any other procedural matters before we continue with cross-examination of the panel?

Attorney Knapp, you are next, followed by the Towns. Just out of curiosity, who from the Towns will be starting off, the collective Towns? I see two hands. Are you going to -- is this going to be a dual team?

Okay. For the record?

MR. ERIC KNAPP: For the record, Attorney Eric Knapp for the Town of Middlefield. And I was a little confused when you said Attorney Knapp followed by the Towns --

CHAIRMAN KATZ: No --

MR. KNAPP: -- since I was hoping I was from a town.

CHAIRMAN KATZ: Right. No, there's a group of them who call themselves the Towns.

MR. KNAPP: Okay, I understand.

CHAIRMAN KATZ: But we give your town the status that it's due. Just the next time come in with apple pies.

MS. RANDELL: Madam Chairman, we've moved down on the table so that -- we thought it would be --

CHAIRMAN KATZ: Okay, we can do that --

MS. RANDELL: -- easier for Mr. Knapp to look at the witnesses for cross-examination --

CHAIRMAN KATZ: If you're going to be accommodating, we'll --

MR. KNAPP: One moment then.

CHAIRMAN KATZ: Okay.

(Pause)

MR. KNAPP: Good afternoon again. Attorney Eric Knapp for the Town of Middlefield. Just three questions being a couple of follow-ups. One -- the first, which is a technical question, and I'm not even sure I'm going to understand the answer, but I figured I would ask, you were showing the three lines and the split-phasing on three lines, what is the magic of three versus some other number? Can you do it with four or six, or some other number? Why are we working just on that? I guess maybe just because that's the way you've always done it. I don't quite understand what the magic of that number is.

DR. JOHNSON: Okay. Gary Johnson. Three lines are three phases, one for each phase of the line, it's the typical way the transmission systems are run. If you have the three phases up there for the standard height line, then you're trying to minimize the field, so you're putting basically conductors of the -- of another phase closest to them. That's sort of how the split-phase design works, you're canceling out say Phase A, which was shown in the video, by ending up putting like Phase C --

MR. KNAPP: Um-hmm --

DR. JOHNSON: -- closest to it. Three phases is the standard way that it's been done. You add conductors, you add height by going to like four lines,

five lines, but you really don't add anything in terms of the phasing or the power transfer. As far as the choice of three phases, that's the most optimal way of transmitting that bulk power. If you do it less than that, you're not getting the -- sort of the best power transfer capability. Perhaps Mr. Zaklukiewicz could go into detail more on exact power transfer and power capabilities, but --

CHAIRMAN KATZ: But before he does, Attorney Knapp, would you like that, it's your question?

MR. KNAPP: Okay. Before I get there I guess, maybe an elaboration perhaps. On the graphs you were showing with the bell curves and the heights and such, are you saying that you would not get appreciably lower numbers then if you went with more or is that not what you're saying? I don't quite -- I --

DR. JOHNSON: Well, for three phase -- looking at the three-phase, basically the DVD is what we did. If you went with -- say started with six conductors --

MR. KNAPP: Um-hmm.

DR. JOHNSON: -- for a standard line, you're moving -- spacing the currents out in space, so it would be similar to the one case that we looked at where

we used six conductors but had them phased ABC on one side of the line, ABC on the other side of the line.

MR. KNAPP: Okay, but what I'm asking you is sort of -- if you had ABCDEF on one side and then ABCD -- or vice -- let's flip them around, F through A on the other side, would you be -- any more appreciable benefits of that or is ABC pretty much the max benefit you're going to get?

DR. JOHNSON: Okay, what -- what you're describing would be like a six-phase line, adding additional phases, which is something that the regular power system just is not set up for.

MR. KNAPP: Okay, I guess that was really my question. Why is three phases the magic number? And you're saying -- (tape stopped) --

(Off the record)

MR. KNAPP: Do I need to repeat the last question or answer, or are we pretty much okay?

CHAIRMAN KATZ: Why don't you go ahead.

MR. KNAPP: Okay --

A VOICE: (Indiscernible) -- did you lose any --

COURT REPORTER: No.

MR. KNAPP: Thank you. So, I guess -- I'm

happy with your answer so far because I'm not sure I would understand a more complicated answer to that, so -- or to the question.

Turning then to your PA 04-246 analysis, did you study whether there were any of these sort of facilities within the required distance to the jog around the Royal Oaks neighborhood? I noticed you just had this sort of straight line on the map there. If you show that jog around, do the results change at all as far as facilities within the distance to the modified route that you're now proposing?

MS. BARTOSEWICZ: I'm assuming you're asking about the Durham bypass?

MR. KNAPP: Yes.

MR. CRETELLA: To the best of our knowledge, the Royal Oak bypass would not have any statutory facilities for buffer zone determination adjacent to the right-of-way.

MR. KNAPP: Okay. So you did, in fact, study north of that relocated route then?

MR. CRETELLA: Based on our view of the aerial mapping that was available, again it's a 2002 source of information. Field verification has not yet been performed for that section.

MR. KNAPP: Okay.

CHAIRMAN KATZ: If I ask his question slightly modified, you had to find a residential area being at least 2,000 feet along the right-of-way, correct?

MS. BARTOSEWICZ: It's actually -- it would be within 300 feet of the edge of the right-of-way for a length along the right-of-way of about 2,000 feet.

CHAIRMAN KATZ: Okay. If we took a broader interpretation, let's say -- well, let's keep your 300 feet, but let's say it doesn't have to have this minimum length, let's just say it's a residence, if you took that broader interpretation, are there any of the statutory structures in the buffer zone near the jog around Royal Oaks?

MS. BARTOSEWICZ: Well, let me -- let me just ask a clarifying question first. So your broader look is is there any residents --

CHAIRMAN KATZ: Yes --

MS. BARTOSEWICZ: -- when you go around the Royal Oak neighborhood, you're essentially north of it and you're in Middletown, and most of that is field. But as you come and loop back around to get back to the right-of-way, you do pass behind a couple of houses.

CHAIRMAN KATZ: Okay. Thank you for that

clarification. Just while I have -- while we're on this thought, how did you come up with 2,000 feet?

MS. BARTOSEWICZ: What we were trying to do with lack of any determination, was trying to find what we thought was a cluster of homes that was adjacent to the right-of-way. We thought the 300-foot distance was close. And we were looking for, you know, a cluster of houses. And our aerial maps show you every single house, so that you already knew. And what we were trying to do is do these magnetic field measurements and calculations. And so we were trying to look -- I mean for us to do every single home along the right-of-way would have been extremely time consuming, so we took --

CHAIRMAN KATZ: Just off the record.

(Off the record)

CHAIRMAN KATZ: Okay. Just to follow up, I mean when you look at -- would it be fair to say when you look at the legislation, it doesn't say a cluster of houses, doesn't it just say residences?

MS. BARTOSEWICZ: I'm sorry? Doesn't it just say?

CHAIRMAN KATZ: It doesn't say a cluster of residences, doesn't it just say residences?

MR. FITZGERALD: Could I --

CHAIRMAN KATZ: Yes --

MR. FITZGERALD: -- respond to that?

CHAIRMAN KATZ: -- this is -- this is a legal thing and you may speak.

MR. FITZGERALD: Yeah, right. We do cover this in our brief. What actually it says is residential area --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- okay, or -- and -- and in the floor debate -- and so the -- residential, well what does that mean? You know, there's no -- there's no definition in the statute. In the floor debate there are a couple of crumbs of help, which -- which we cite in our brief. And we've given you the whole debate too, but the crumbs are that -- there's a question from one of the legislators to the co-chair of the committee who -- that reported the bill, which is sort of the best you can do in terms of legislative history, and they say what's a residential area, and the response is basically good question, we're going to let the Siting Council --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- decide that. And he says, you know, you can look at it one way and you could get -- you could have a farm, and just because there's a

house on the farm, you could say that's a residential area, but that's not what we mean, but he doesn't -- he doesn't really come out and say what they do mean --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- and then there's another exchange in which the expression is used we're talking about subdivision type developments or something -- or something along those lines. Then you have the repeated statements and other context, and what they're looking to do is to look at places where there are aggregations of children.

So from that, we said what we should be looking for, all of it subject to the Siting Council, you know, ultimately determining what definition they're going to use, but we've got to start somewhere, and so we said let's come up with a way, a quantitative way that will serve to identify these sort of subdivision type developments. And it was from there that the -- that this rule of thumb of the 2,000 feet --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- and 300 feet came up. And then -- and then they tried it out and said well let's see, you know, everybody has in their head, you know, Royal Oak. I mean Royal Oak has got to be -- does it work

for Royal Oak, yeah. Does it work for this, does it work for that, and they went from there. Now, of course, all the houses that existed at the time of the aerial photography are on the map --

CHAIRMAN KATZ: Right --

MR. FITZGERALD: -- but in terms of designating here's where we think there's a statutory residential area, that's how we got it.

CHAIRMAN KATZ: Well, we'd appreciate it in the post-hearing briefs to have all parties and intervenors weigh in on what is a good definition of residential areas as regard to buffer zones in this docket. Mr. Emerick.

MR. BRIAN EMERICK: Yeah, a question in terms of split-phasing. If in fact there is a commitment or the Council decides that an area because of the presence of a statutory structure, residential area, whatever, that split-phasing, or optimized split-phasing is appropriate, once you make that threshold decision and we take Chestnut to Beseck, and let's say there's one of those facilities along that area and you want to apply that mitigation technique, doesn't that, essentially, say you're going to do split-phasing for that whole segment?

MR. FITZGERALD: Well, it certainly says

you're going to do it for more than that facility, sure. I mean there's -- there could -- it could be that there is a --

A VOICE: (Indiscernible) --

CHAIRMAN KATZ: You're --

MR. FITZGERALD: I'm sorry, that's right -- that's right --

CHAIRMAN KATZ: I was --

MR. FITZGERALD: -- that's right --

MR. EMERICK: I was looking --

MR. FITZGERALD: -- you're beyond --

CHAIRMAN KATZ: I was going to --

MR. FITZGERALD: -- you're beyond the legal questions and let me -- let me shut-up --

MS. BARTOSEWICZ: No, but --

CHAIRMAN KATZ: Mr. Fitzgerald, while I admire your knowledge of this docket, I was going to ask one of these people to answer that question.

MR. FITZGERALD: Thank you.

MS. BARTOSEWICZ: No, but, Mr. Emerick, you can -- you can -- you can do split-phasing where you'd like to. Essentially, you can start with structures that are just three-phase structures and choose to go into a split-phase and you could -- and you transition into it.

And you can do it for as long as you'd like, and you can transition back out of it. So you can -- you can choose to do a short length or a much longer length, but there is a transition to get to -- from a regular three-phase situation to the split-phase.

MR. EMERICK: Just -- and I'm trying to recall. I think in the past we were talking a couple thousand feet and I wasn't -- I thought we had before where we talked about it might need several structures to do it. But then in the demonstration video we had this morning to accomplish that, they had to stick this into a box. And I guess my question is I was never prior to that thinking that this had to go into a box, so --

MS. BARTOSEWICZ: It doesn't --

MR. EMERICK: -- this can be just done on structures without going into --

MR. ZAKLUKIEWICZ: It -- it doesn't have to go into a box, Mr. Emerick. What you would do is you would convert from say a vertical construction or an H-frame construction to a vertical construction, and then possibly from that point go to a split-phase. In most cases if you want to get around an area, consider -- you need one or two structures beyond the area where you're going to have to split-phase to make the conversion. And

it is extremely difficult where you have a sharp angle to make it at that point also. So if you've got a 2,000 foot section that you want split-phasing in, consider the 2,000 foot or possibly two more structures on each side of that 2,000 foot section to make the transition.

CHAIRMAN KATZ: But --

MR. EMERICK: But --

CHAIRMAN KATZ: -- let's just take one of the sections --

MR. EMERICK: Yeah --

CHAIRMAN KATZ: -- like I think it was Pease to Glenville, or one of those sections, you can modify the split-phase back and forth within that section, right, from one side to another side?

MR. FITZGERALD: Excuse me, do you mean one side of the right-of-way?

CHAIRMAN KATZ: Yes. Because you gave options where this option does well on this side of the right-of-way, but it doesn't do as well on that side, and that option does better on that side of the right-of-way than this side. Can you go down -- you know, like for example you gave us an example of a seven-mile stretch -- can you do something for awhile and then switch it and do something else, or does the whole seven-mile stretch have

to be one type of split-phasing?

MR. ZAKLUKIEWICZ: I -- I think it would be more difficult to turn around and where the existing right-of-way has 115,000 volts transmission on it already, say if that was -- if that 115-kV is on the south side of the right-of-way and you're going east/west, basically if the 345 was going to be put on the north side, you would have difficulty then moving the 345 and the 115 if it was a combination monopole or some other, from north to south, to north to south along a right of way that goes east/west.

CHAIRMAN KATZ: Okay, so those transition points -- those cross-section points you gave us this morning in your presentation are the transition points?

MS. BARTOSEWICZ: Hold on -- I think, Chairman Katz, your question was could you change your split-phase options as you move down the right-of-way?

CHAIRMAN KATZ: Yes.

MS. BARTOSEWICZ: And so that if you've got a long enough section -- and I think the one we pointed out this morning -- the west and the east side areas were far enough away. If they're far enough away that allows you to transition from one set of structures to the other, you could engineer it.

CHAIRMAN KATZ: Okay. But you need a little bit of distance --

MS. BARTOSEWICZ: You need distance --

CHAIRMAN KATZ: Okay --

MS. BARTOSEWICZ: -- like Mr. Zaklukiewicz had said, that you need those structures on either side to do the transition.

CHAIRMAN KATZ: Okay.

MR. EMERICK: Madam --

CHAIRMAN KATZ: Yeah, Mr. Emerick.

MR. EMERICK: Just to follow up. If I were in the field -- I mean, obviously, we have three phases, if we look at only one of the phases, we now want to have it in two wires, I mean is it a splice, some kind of a joint that's done in the field so if I'm looking a tower somewhere, I'm going to see one wire on one side and perhaps on the other side I'm going to see two?

MR. ZAKLUKIEWICZ: That -- that is correct. It would be -- it would be at an insulator location where we would turn around on the yoke that makes up the connections, we would -- instead of coming across with only one wire, we would actually have a junction point there where you would end up coming across with two wires for each of the phases.

MR. EMERICK: Okay, thank you.

CHAIRMAN KATZ: Okay, back to --

MR. ASHTON: Mr. -- Mr. Zak, just a follow-up question. Don't you -- the systems in Connecticut contain a number of transition points already where the phases are rolled for balancing purposes and not for what we're calling split-phasing here?

MR. ZAKLUKIEWICZ: That is correct, especially on the high voltage systems, meaning the 345-kV system, we roll -- and you roll -- also when you're going sometime between an H-frame and a vertical, you end up rolling again in those combinations depending on the circumstances of the transmission line.

MR. ASHTON: And that's, essentially, the same type of process that we're talking about here, isn't it?

MR. ZAKLUKIEWICZ: Not much different --

MR. ASHTON: Thank you --

MR. ZAKLUKIEWICZ: -- than what we've already -- what we typically have used on the transmission system over a number of years.

MR. ASHTON: Thank you.

CHAIRMAN KATZ: Back to you, Mr. Knapp.

MR. KNAPP: Thank you. Actually, just one,

hopefully, really short question that I think I already know the answer. I noticed in the maps that I received yesterday in the CD there's nothing shown for the northerly route, an alternative as far as PA 04-246. Has that been studied at all by the Applicant?

MS. BARTOSEWICZ: PA 04-246 actually requires you to provide these -- this information on the proposed route. However, for information and to help the Council, we also provided this information on other routes that the Council had been discussing here. And I believe the northerly route -- and we can -- subject to check, should have been on those maps.

MR. KNAPP: I mean I saw the large purple band there, but I didn't see anything next to it on either side. Is that just because there happened to be nothing next to it?

MS. BARTOSEWICZ: That's -- that's a fair statement.

MR. KNAPP: I have no further questions.

CHAIRMAN KATZ: Thank you. And Mr. Knapp, please thank the First Selectman of Middlefield for getting together with the neighboring towns and providing us detailed comments.

MR. KNAPP: I was expecting him to be here,

but I will certainly do that.

CHAIRMAN KATZ: Well, we appreciate that input. Okay, next on the list is Attorneys Frank and Kohler. We -- could we get two chairs up there.

(Pause)

MR. FRANK: For the record, Monte Frank for the Town of Woodbridge.

MS. JULIE DONALDSON KOHLER: And Julie Donaldson Kohler for the City of Milford.

CHAIRMAN KATZ: Can we throw Weston in there or is that separate?

MR. FRANK: I'm asking questions now for the Town of Woodbridge --

CHAIRMAN KATZ: Okay --

MR. FRANK: -- on EMF issues.

CHAIRMAN KATZ: Okay.

MR. FRANK: The first presentation that was made this morning contained a number of slides. The question -- the question is those slides were based entirely on the 15-gigawatt case, is that correct?

MS. BARTOSEWICZ: That's correct.

MR. FRANK: Okay. And that represents the average load today?

MR. ZAKLUKIEWICZ: Yes, it does.

MR. FRANK: Now, you --

MR. ASHTON: (Indiscernible) -- Mr. Zak, the 15 gigawatts is really the average of the New England system peak, is that correct?

MR. ZAKLUKIEWICZ: That is correct.

MR. ASHTON: And it may or may not represent the average flow on that line, it's represents the conditions of flow for that 15 megawatt -- or 15-gigawatt load?

MR. ZAKLUKIEWICZ: I believe we -- we already provided a curve --

MR. ASHTON: Yes --

MR. ZAKLUKIEWICZ: -- for that to show in earlier testimony --

MR. ASHTON: And that's --

MR. ZAKLUKIEWICZ: -- on where the hours per year were for the cases.

MR. ASHTON: And that's the so-called load duration curve that you use?

MR. ZAKLUKIEWICZ: The load duration curve per hour.

MR. ASHTON: Right. And so -- but that may or may not -- that could be even a peak hour of flow depending on the generation dispatched down there,

couldn't it?

MR. ZAKLUKIEWICZ: The flow on any given line is going to be determined on the generation at any given -- that's on at any given time. And it is an approximation when we ran the 15-gigawatt case as to what the flows were on the lines for what we considered to be what dispatch would be on in Connecticut at the time.

MR. ASHTON: Okay.

MR. ZAKLUKIEWICZ: I believe that would be in Exhibit 87, but those were done for what we anticipated to be dispatchable generation on for that load condition.

MR. FRANK: Believe it or not, Mr. Ashton, you actually anticipated some of my questioning, but I mean I will get back to that point.

MR. ASHTON: I'll take it as a compliment.

MR. FRANK: You also modeled a 27.7 gigawatt case, is that correct?

MR. ZAKLUKIEWICZ: Yes, we did.

MR. FRANK: Okay. That's contained in Exhibits 1 and 2 of Dr. Bailey's testimony?

DR. BAILEY: Calculations based upon --

CHAIRMAN KATZ: Wait -- Dr. Bailey, just wait a second, I'm going to have you start over.

DR. BAILEY: Calculations based upon those

loading conditions were included in Exhibits 1 and 2.

MR. FRANK: Okay. And those calculations were not presented in the slides this morning?

MS. BARTOSEWICZ: That's correct.

MR. FRANK: Now, you modeled a 27.7 gigawatt case in order to bound the upper limit of the magnetic fields that could be associated with the lines in normal operation, right? That's on page 3 of your prefiled testimony, Dr. Bailey.

DR. BAILEY: Yes.

MR. FRANK: Okay. And I believe there was earlier testimony in this proceeding that it is possible that you will reach the peak load of 27.7 gigawatts by 2007, which is the date when this line is suppose to be in service, correct?

MR. ZAKLUKIEWICZ: Under extreme weather conditions, the answer is yes.

MR. FRANK: Okay. Now, the ROC group, which is the Reliability and Operability Committee?

MS. BARTOSEWICZ: Correct.

MR. FRANK: Okay. For Case No. 6 performed a thermal and voltage analysis, right?

MS. BARTOSEWICZ: That's correct.

MR. FRANK: And the ROC group looked at a

peak load of 30 gigawatts?

MS. BARTOSEWICZ: That -- that is correct.

MR. FRANK: Okay. And I -- correct me if I got this wrong, but on the conference call on July 20th, I believe it was stated by the Applicant that it is possible to reach 30 gigawatts in 2010 to 2012?

MR. ZAKLUKIEWICZ: Under -- under high load peak conditions, the answer was yes.

MR. FRANK: Okay. And Dr. Bailey, you have not calculated EMF assuming a 30-gigawatt case?

DR. BAILEY: No.

MR. FRANK: Okay. Dr. Bailey, am I correct that generally speaking as the load increases, the EMF levels also increase?

DR. BAILEY: On -- on a -- it would depend upon what system you're talking about. Are you talking about a single line, multiple lines --

MR. FRANK: Okay, fair enough. Am I -- is it fair to say that when you compare the 15-gigawatt case here to the 27-gigawatt case, the EMF numbers for the 27.7 gigawatt case are generally higher than the 15-gigawatt case?

DR. JOHNSON: In general terms that's probably a correct statement. There are --

MR. FRANK: That's all I --

DR. JOHNSON: -- generally --

MR. FRANK: Generally speaking --

DR. JOHNSON: There are some exceptions where actually as you go to higher loadings, the fields at the edges of the right-of-way will go down --

MR. FRANK: Okay --

DR. JOHNSON: -- for a multi-line --

MR. FRANK: Generally -- generally speaking, that's a correct assertion?

DR. JOHNSON: For a single line, that's true --

MR. FRANK: Okay --

DR. JOHNSON: -- for multiple lines, it can vary depending on the situation.

MR. FRANK: Okay. Now, we -- we have been speaking so far about the loading New England wide, right?

MR. ZAKLUKIEWICZ: Correct.

MR. FRANK: Okay. Now, the models that you ran do not tell us what the load is at any given time at a specific location, right?

MR. ZAKLUKIEWICZ: I believe that's correct.

MR. FRANK: And you also agree that the

load fluctuates depending on system usage?

MR. ZAKLUKIEWICZ: The load will fluctuate -- or the current flow on a transmission line will fluctuate as a result of the load and the dispatch in the local area.

MR. FRANK: Okay. What is the anticipated maximum capacity of the Middletown/Norwalk line?

MR. ZAKLUKIEWICZ: The conductors that are being placed in service are bundled 1590 KCM ACSR conductors. Their capability if the system was able to push that much current over the lines is somewheres around 3600 amperes on the 345.

MR. FRANK: Okay. And Dr. Bailey, you did not model EMF based upon the maximum capacity of the line, correct?

DR. BAILEY: Not on those values.

MR. FRANK: Now, Dr. Bailey, in your testimony you state that rerouting is a means of reducing magnetic fields, is that correct?

DR. BAILEY: It's one possible option.

MR. FRANK: Okay. And on page 5 of your prefiled, you state that the design options are not site specific and do not take into account the potential relocation of the right-of-way on the B'Nai Jacob property

and the JCC complex in Woodbridge. First of all, could you tell me what the rerouting options are for the B'Nai Jacob/Ezra property?

MS. BARTOSEWICZ: For the B'Nai Jacob/Ezra property, they own some property to the --

MR. FRANK: Who's they?

MS. BARTOSEWICZ: The B'Nai Jacob Congregation. They own property that is to the -- I want to say to the right, but it's --

A VOICE: West.

MS. BARTOSEWICZ: West of where the existing -- I need a picture -- where the existing right-of-way is. If you were to, essentially, push the right-of-way over to the edge of that property, you would increase the distance between the edge of the right-of-way and the facility.

CHAIRMAN KATZ: Is that a supported change?

MS. BARTOSEWICZ: That is a change that the companies would be happy to do for B'Nai Jacob.

MR. FRANK: Are there maps available that show that change?

MS. BARTOSEWICZ: The -- I believe we have filed in this proceeding a map that shows that change.

MR. FRANK: Okay.

CHAIRMAN KATZ: Mr. Fitzgerald.

MR. FITZGERALD: I believe that they were attached as an exhibit to Dr. Bailey's supplemental testimony concerning site specific designs to reduce fields at B'Nai Jacob and the JCC, which is dated -- Exhibit 73, April 30th.

CHAIRMAN KATZ: Thank you. And I'm going to ask the witness panel that when alternatives are discussed, please indicate to the Council whether this is something that the company is willing to do or is this something that you were asked to look into that you are not willing to do, and I think that will be helpful to the Council.

MS. BARTOSEWICZ: Sure.

MR. FRANK: So just for the record, that's page 10, Dr. Bailey, of your April 30, 2004 supplemental testimony?

DR. BAILEY: Let me -- (pause) -- I have it on Exhibit 3 --

MR. FRANK: And is it 10 at the bottom of the page for the page number --

DR. BAILEY: Yes --

MR. FRANK: -- is that right?

DR. BAILEY: -- page 10.

MR. FRANK: Okay. And Dr. Bailey, have you derived any EMF calculations for this supported change?

DR. BAILEY: If you look on the following page, page 11, there are evaluations made of 15 gigawatts and 27 gigawatts for the fields with the relocated right-of-way.

CHAIRMAN KATZ: Mr. Emerick, I'm going to allow you a follow-up question if this is a good time. Mr. Frank, Mr. Emerick has a follow-up.

MR. EMERICK: Just one point of clarification with respect to that alternative. Does that alternative -- and I'm recalling something from the written testimony and I could be confusing it with another situation -- but responding to that statutory structure, does that alternative then place it closer to another statutory structure?

MS. BARTOSEWICZ: Good question. There is a home in the corner of that lot that the new relocated right-of-way would move closer to that single home.

MR. EMERICK: But it's -- it's not a residential area as you've defined it, but it is a home?

MS. BARTOSEWICZ: That's correct.

MR. EMERICK: Okay, thank you.

MR. FRANK: And what are the rerouting

options for the JCC?

MS. BARTOSEWICZ: The JCC had asked the companies to see if we could also move the right-of-way away from their facilities. The companies provided JCC -- and as a matter of fact, those drawings are attached to their recent testimony -- two options of moving. One -- the first one would be a jog in the right-of-way, moving it further away from the JCC facility itself. And the second one was moving the right-of-way as far -- as far along the back edge of the JCC property as we could. And we provided sketches to the JCC of both of those options.

CHAIRMAN KATZ: And?

MS. BARTOSEWICZ: I -- well -- and -- I can't put words in the JCC's -- for the JCC. They'll have to speak to those options themselves. We were -- they had a problem with those options, so I --

CHAIRMAN KATZ: Okay. So would it be fair to say that if they supported those options, the company would be supportive?

MS. BARTOSEWICZ: And if the -- if the Siting Council wishes us to do that, we would certainly do that.

CHAIRMAN KATZ: Okay.

MR. FRANK: It's also fair to say that

B'Nai Jacob and Ezra Academy did not support the option that Dr. Bailey testified about?

CHAIRMAN KATZ: Can you --

MS. BARTOSEWICZ: I --

CHAIRMAN KATZ: -- make the question more specific for us?

MS. BARTOSEWICZ: I can't answer for B'Nai Jacob.

MR. FRANK: Okay. I'll move on.

CHAIRMAN KATZ: Yeah.

MR. FRANK: With respect to the JCC property, are you aware of CL&P property that is adjacent to the JCC property?

MS. BARTOSEWICZ: There -- there is CL&P property adjacent, which would be to the west of the JCC property.

MR. FRANK: And have you explored moving the JCC day camp, for example, onto that parcel?

MS. BARTOSEWICZ: We have had conversations with the JCC delegation, I guess you could call them, about moving that right-of-way and what it might entail.

MR. FRANK: Okay. And how about moving any of the JCC facilities to the CL&P property?

MS. BARTOSEWICZ: The two facilities in

question would be the swimming pool and their day camp I believe. The --

CHAIRMAN KATZ: Was there any mutual -- mutually agreed upon decisions based on these conversations?

MS. BARTOSEWICZ: No.

CHAIRMAN KATZ: Okay.

MR. FRANK: Now, Dr. Bailey, on page 7 of your prefiled testimony, you state I understand that some playgrounds have been constructed partially within the right-of-way, there may also be structures, even parts of houses that have been constructed within the right-of-way; as the company's buffer brief -- buffer zone brief points out, in such cases the new statute would appear to require the companies to enforce their easements to prevent such uses on the right-of-way. Do you recall that testimony?

DR. BAILEY: Yes, I do.

MR. FRANK: Okay. Now, the new statute applies to electric transmission lines that are 345-kilovolt or greater. Do you agree?

DR. BAILEY: Yes.

CHAIRMAN KATZ: Well, I guess I'm --

MR. FITZGERALD: That's --

CHAIRMAN KATZ: Why are you asking him --

MR. FITZGERALD: Yeah --

MR. COLIN C. TAIT: Legal questions?

CHAIRMAN KATZ: -- legal questions?

MR. FITZGERALD: The --

MR. FRANK: I'm asking him about his testimony.

MR. TAIT: He's not -- (indiscernible) --

CHAIRMAN KATZ: Okay, we'll --

MR. FRANK: I mean --

CHAIRMAN KATZ: Yes?

MR. FRANK: Dr. Bailey, are you suggesting that if the Council approves an overhead 345-kilovolt line in Segments 1 and 2, in certain areas where there are structures or parts of homes or playgrounds that encroach, they would have to be removed?

DR. BAILEY: That -- that's an issue to be resolved by the companies and the Siting Council. I'd don't know what the legal description of those easements are and what responsibilities the adjacent landowners have and the companies have.

MR. TAIT: Mr. Frank, just because he gave an legal opinion does not mean that you need pursue it.

MR. FRANK: If I may have a little latitude, perhaps we can get to some facts that are

related to it.

MR. TAIT: But his opinion on whether they'd have to be removed or not is not before us.

MR. FRANK: Assuming that -- assuming that, that those -- that those houses or structures would potentially have to be removed, how many houses or structures are we talking about in Segments 1 and 2?

DR. BAILEY: I do not know. This is -- this is generally with respect to the entire overhead route. I had seen examples on the aerials where there were encroachments into the right-of-way, but I did not make an enumeration of them.

MR. FRANK: Okay. And in the Applicants' buffer zone brief, they also -- the Applicant states that there are schools that would potentially -- that if potentially encroach would have to be removed --

CHAIRMAN KATZ: Well --

MR. FRANK: -- and I guess my question is assuming --

MR. TAIT: Mr. Frank, you're going down the wrong road.

MR. FRANK: I'm asking a factual question. I'm not asking his opinion. I'm asking him if that is the case, how many schools and which ones are we talking

about.

CHAIRMAN KATZ: But you're cross-examining on a brief.

MR. FRANK: But he -- he referred to it in his prefiled testimony and I --

CHAIRMAN KATZ: Well shame on you, Dr. Bailey, you shouldn't have even gone down that road.

MR. TAIT: But he's not a lawyer. He's not giving a legal opinion. So he said it.

MR. FRANK: In rendering your opinion, Dr. Bailey, did you review the Applicants' brief on buffer zones?

DR. BAILEY: I did.

MR. FRANK: And did you consider it in preparing your testimony?

DR. BAILEY: Only indirectly.

MR. FRANK: Okay, fair enough.

(Pause)

MR. BRIAN O'NEILL: Madam Chairman --

CHAIRMAN KATZ: Yes, Mr. O'Neill --

MR. O'NEILL: -- if I may take advantage of the pause for a moment --

CHAIRMAN KATZ: -- Mr. O'Neill.

MR. O'NEILL: -- and ask Dr. Johnson a

question. I noted with interest on your resume that you are an expert in the use of shielding. Does that extend itself into architectural shielding from EMFs? And if so, would there be any applications for people who were concerned about exposure?

DR. JOHNSON: I've looked at -- questions usually involve transformer vaults in like office buildings where you may have typically computers located right above or in very close proximity to the transformer coming into the building. In those cases, you can look at thicknesses of different metal, ferromagnetics like iron or steel; or also for AC, aluminum, eighth-inch, quarter-inch thick plates of aluminum, something that's highly conductive can be used to help shield against the magnetic field. And in those cases you're looking at putting shielding or plating basically within the structure of the room, floors, ceiling, and that's to reduce the magnetic fields that may cause some screen bounce on the computer monitors.

As part of my past also at the high-voltage transmission research center, we've looked also at other cases where you can reduce the fields; that's some of the options with the split-phasing, active or passive cancellation loops, as well as the material shielding when

you get into specific rooms or office type settings.

MR. O'NEILL: Do you know of any instances in New York City for example where architectural shielding has been used to alleviate the concerns of abutting residential properties or within the cores of high-rise apartment houses for example?

DR. JOHNSON: Not -- I couldn't give you specific residences. It may have been used, but I'm not directly familiar with it.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Back to you, Mr. Frank.

MR. FRANK: Thank you. If I could go back to my prior point and I'm going to open it up to the panel. In the Applicant's brief they make a point that structures that are residences or schools that may encroach into existing right-of-way and that those structures or schools would have to be removed. And I guess the question is which schools in particular would have to be removed?

MR. FITZGERALD: Let me make a statement that is somewhat by way of objection, but also to deliver a witness who can give an answer to the question --

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: -- I believe -- I wrote

the brief -- I believe that I was talking about a number of things, one of which was if the right-of-way is required to be expanded to enlarge the buffer zone, things may need to be removed. I also referred to structures within the right-of-way. What I had in mind were not buildings such as homes necessarily, but other kinds of structures --

CHAIRMAN KATZ: But you have a witness who can give a factual answer --

MR. FITZGERALD: And we do have -- we do have Mr. Cyril Welter from Burns and McDonnel, who is the person who gathered a lot of this information, and he can answer Mr. Frank's -- he can tell Mr. Frank what we -- what the state of current knowledge is about what's in the right-of-way.

CHAIRMAN KATZ: Okay. Has he been sworn?

A VOICE: Yes.

MS. RANDELL: Yes.

CHAIRMAN KATZ: Okay. Then why don't we have that.

COURT REPORTER: Have him state his name please.

CHAIRMAN KATZ: Yes. When you get seated and get the mic in front of you, if you could give your

name again.

MR. CYRIL WELTER: Okay. Are we on? My name is Cyril Welter, C-y-r-i-l, W-e-l-t-e-r.

MR. FRANK: And just so the record is clear because I do not want to mischaracterize Mr. Fitzgerald's brief, what he says, and I quote, is "in a few cases structures of adjacent statutory uses such as residences or schools may encroach into the existing right-of-way". "Such encroachments are similarly incompatible with the buffer zone requirement. Accordingly in these instances CL&P will comply with the buffer zone requirement by enforcing its easement to require that the encroaching portions of the structures be removed from the right-of-way."

CHAIRMAN KATZ: Okay. And this witness will comment on those structures.

MR. WELTER: Okay. What we're referring to is when we tried to identify buildings along the right-of-way using aerial photography and placed an edge of right-of-way on that, we could see that there definitely are auxiliary facilities that are within the right-of-way. People have swimming pools, they have some sheds, garages, other things like that. When it comes to these major structures, such as houses and schools and that, some of

those are very close and it would take a surveyor to determine if they are in or out. So we said there may be some that could be, you know, five feet, ten feet inside, or they're at the edge, or something like that. It couldn't be determined definitively. The only time that we identified houses or other major structures that might have to be removed was when we were talking about expanding the right-of-way, particularly through Bridgeport and Stratford where we've already stated there are 29 such houses or businesses that would be affected. The schools in some cases, the property is crossed by the right-of-way. So that facility, if you want to use the broader term, is within the right-of-way.

CHAIRMAN KATZ: In Segments 1 and 2, did you identify structures --

MR. WELTER: No, not --

CHAIRMAN KATZ: -- that would have to be removed?

MR. WELTER: No. There were ones that we said are on the edge. And the word may is in there for that reason.

MR. O'NEILL: Mr. Welter --

MR. WELTER: Yes?

MR. O'NEILL: -- in your review of this

project, did you review any of the community standards or the municipal standards for building within the right-of-ways?

MR. WELTER: I don't recall seeing anything on that, no.

MR. O'NEILL: So in essence, tomorrow someone could build a new structure within the right-of-way as far as your understanding is?

MR. WELTER: Well, my understanding would be that the easement precludes anyone doing that. And they -- in other words, that would be in violation of the easement on that property.

CHAIRMAN KATZ: Wouldn't it also be fair that you can't get a building permit from your town to do a structure in the right-of-way?

MS. BARTOSEWICZ: Chairman Katz -- (indiscernible) -- you would think that's the case --

COURT REPORTER: Hold on please --

MS. BARTOSEWICZ: I said Chairman Katz you would think that's the case.

MR. O'NEILL: So did you notice any structures that were in violation of local building codes from your point of view?

MR. WELTER: What we're saying is we saw

some of these out-buildings, if you want to call it that, that are in the right-of-way.

MR. O'NEILL: Thank you.

MR. WELTER: Yes.

MS. RANDELL: Madam Chairman, may I just clarify the record? Mr. Welter responded to a question I believe from you with respect to Segments 1 and 2. And it was not clear to me whether he was referring to buildings, schools, and houses in the right-of-way, major structures as opposed to sheds, garages, swimming pools and the like. Could I ask that that just be clarified? Mr. Welter, with respect to Segments 1 and 2, are there sheds, swimming pools and the like encroaching within the existing right-of-way? It was just not clear to me --

MR. WELTER: Yes --

MS. RANDELL: -- from your answer.

MR. WELTER: Yes, there are.

MS. RANDELL: There are. So when you responded to the Chairman that there are no structures, you were referring to the major structures, schools and the like?

MR. WELTER: Schools and houses.

MS. RANDELL: Thank you.

CHAIRMAN KATZ: Thank you. Back to you,

Mr. Frank.

MR. FRANK: With respect to B'Nai Jacob and Ezra Academy, the parking lot for example encroaches into the right-of-way?

MR. WELTER: That's correct.

MR. FRANK: Is it your opinion that that parking lot would have to be removed?

MR. FITZGERALD: Objection --

MR. WELTER: I don't have an opinion on that. I think that's --

CHAIRMAN KATZ: Yeah, now you're --

COURT REPORTER: One at a time please.

CHAIRMAN KATZ: Now you're --

MR. FRANK: I have nothing --

CHAIRMAN KATZ: Good, okay. We're in agreement.

MR. FRANK: I have some questions about the video this morning and I would request a copy of that. Dr. Bailey, on --

CHAIRMAN KATZ: For parties and things like that -- (laughter) --

MR. FITZGERALD: That's good. We said parties and -- we have copies available for parties and intervenors --

MR. FRANK: I looked for it on Amazon this morning and I couldn't find it.

COURT REPORTER: One moment please. (Pause). Thank you.

CHAIRMAN KATZ: My understanding is, Mr. Frank, we're all getting paper copies of that hopefully this afternoon.

MR. FRANK: Yeah, I think that one could win an Oscar for best foreign film. (Laughter).

Dr. Bailey, on page 6 of your prefiled testimony, dated July 19, 2004, you state that you are constructing a small laboratory model of a split-phase transmission line to illustrate how adding three additional conductors and splitting the power flow among six conductors affects the magnetic field as the phasing of the conductors is varied. Is that what we saw this morning in the video?

DR. BAILEY: Yes.

MR. FRANK: Okay. And you state that the studies will confirm that a split-phase design can be incorporated into the transmission system and that the reductions in the magnetic field occur in the, and I quote you, "real world, not just in theory". Is --

DR. BAILEY: There --

MR. FRANK: My question is --

CHAIRMAN KATZ: What? Is there an objection to the question?

MR. FITZGERALD: Okay -- I'm sorry -- no, I'm sorry -- just wait. (Laughter).

MR. FRANK: My question is, is it -- the parking lot experiment, does that bring split-phasing from the realm of theory to the real world?

DR. BAILEY: It was -- it was, as I described it, a demonstration. If you go further up in that paragraph, it states we made a site visit during which we measured the electric and magnetic fields under sections of line configured in a split-phase design and under other sections of the same line configured in the delta design. This is an operating 115-kV line in western New York State and Dr. Johnson made measurements there. And that was, I believe a more relevant part of the reference that this is an operating transmission line with a split-phase design.

MR. FRANK: Okay. So it's primarily the 115 transmission line that brought split-phasing from theory to the real world and not the experiment?

DR. BAILEY: Yes.

MR. FRANK: Nothing further from -- I'll

turn it over to Attorney Kohler.

MS. KOHLER: Fortunately, Chairman Katz and Mr. Emerick have answered -- have already asked a lot of the questions, so I get to bat cleanup for everyone.

Dr. Bailey, in your prefiled testimony you talk about several ways that you think that magnetic fields can be reduced, and the first one is relocating the line either underground or overhead. I believe you previously testified that underground transmission lines have minimal EMF impact to the surface environment?

DR. BAILEY: Well, it depends on where you are in relationship to that line. You could be standing above the conductors of an underground line and encounter a higher magnetic field than you would at the edge of a right-of-way of an overhead line. So --

CHAIRMAN KATZ: When you say above, you mean like immediately over?

DR. BAILEY: Right, standing, you know, three -- three feet -- or actually, for measurements would be one meter above ground -- the measurements if you're six feet from the conductors of an overhead -- of an underground line, the field, the magnetic field may be higher than what you would measure at the edge of a right-of-way from an overhead line.

MS. KOHLER: So if -- if the underground -- are you assuming that the underground lines are buried to a level that you're proposing in Segments 3 and 4, eight feet?

DR. BAILEY: Yes -- well --

MS. BARTOSEWICZ: Excuse me. We're not proposing eight feet to bury underground lines.

MS. KOHLER: Okay. What -- what level are you proposing?

MR. ZAKLUKIEWICZ: Three feet plus 21 inches -- three feet plus twenty-eight inches --

COURT REPORTER: I'm sorry, I didn't hear you --

MS. BARTOSEWICZ: Yes, three feet plus twenty-eight inches.

MS. KOHLER: Wouldn't you agree though, Dr. Bailey, that if undergrounding was technically feasible, it would be the most reliable way to mitigate EMF impacts?

DR. BAILEY: I don't know that I have a firm conclusion about that.

CHAIRMAN KATZ: Dr. Johnson, is there a way to shield that person who's standing over the underground line?

DR. JOHNSON: You could reduce the fields

by metal plating, aluminum or ferromagnetic plating --

CHAIRMAN KATZ: Would it have to be like a very thick plate or -- I mean are we talking something that's very cost prohibitive or are we just talking aluminum foil?

DR. JOHNSON: No, no, you're not talking aluminum foil. You're talking, depending on the level of shielding, a rough estimate probably is at least a quarter inch high grade aluminum plating, or possibly something like a half-inch possibly thicker steel type plating and over something more than just like a foot or two. To really have any impact, you're probably talking at least, without looking at it in detail, probably eight feet wide along the entire length.

CHAIRMAN KATZ: And do either of you know how much EMF reduction you would get by this aluminum shielding over the underground line?

DR. JOHNSON: Not off the top of my head. Depending on the location of the -- basically the geometry of the line and the person --

CHAIRMAN KATZ: I'm going to ask you to take that as a homework assignment for our later undergrounding days. Yes, Mr. Emerick.

MR. EMERICK: Just a follow-up. And I know

the information is here in the record, but frankly I just can't recall it. But I mean as I imagine what was proposed along Route 1, that this line would more or less follow the edge of the paved road or perhaps even under sidewalks, which is the area where uncontrolled populations could be. What kind of level are we talking about to that person walking along the sidewalk imagining that the line is perhaps right below them?

MS. BARTOSEWICZ: In the application we filed EMF levels for the underground portion, so it can be found in there --

MR. EMERICK: I know it could be found --

MS. BARTOSEWICZ: Yeah --

MR. EMERICK: -- I couldn't recall it. We're talking about reducing it --

MS. BARTOSEWICZ: It looks --

MR. EMERICK: -- and I'm trying to get a picture on what we are actually -- on what was proposed.

CHAIRMAN KATZ: Off the record.

(Off the record)

MS. BARTOSEWICZ: On -- in Volume 6 of 12, and I'll use -- I'll use an example, page 54, it's a magnetic field profile for Cross-Section 9-A, which was -- it just happened to be from Singer to Hawthorne,

Alternative A, it shows a magnetic field profile. And in the center of that profile, you're looking at about, you know, 2 to 3 milligauss, right -- right in the middle --

MR. ZAKLUKIEWICZ: Directly above --

MS. BARTOSEWICZ: -- directly above. And that would be -- that was for HPFF cable.

CHAIRMAN KATZ: And would it be different for XLPE?

MS. BARTOSEWICZ: Yes, it would.

MR. ZAKLUKIEWICZ: Yes.

CHAIRMAN KATZ: Less or more?

MS. BARTOSEWICZ: More.

MR. ZAKLUKIEWICZ: More.

DR. BAILEY: More.

CHAIRMAN KATZ: And can we have an estimate of how much more?

MR. ASHTON: Miss Bartosewicz, can I suggest you look at page 26.

MS. BARTOSEWICZ: I'm sorry, Mr. Ashton?

DR. BAILEY: On page 26 those values are at the edge of the right-of-way. They're not values directly above the conductors.

CHAIRMAN KATZ: Okay. What I'm going to ask you to do is perhaps maybe as part of your August 16th

report -- if you come in with certain undergrounding in the August 16th report, can we have an EMF of what those underground portions would emit? Is that --

MS. BARTOSEWICZ: We also do have some in our application. On page 56 there is a cross-section for XLPE in this chart.

CHAIRMAN KATZ: And how much -- how many milligausses is that?

MS. BARTOSEWICZ: This is coming in out of Singer, so there's two cables, and it's about 28 milligauss.

CHAIRMAN KATZ: Okay. This is good that we're doing this. Thank you, Miss -- so can we -- is that a reasonable request that as part of your August 16th report what you propose to have underground, you'll give us EMF readings on that?

MS. RANDELL: I'm not sure we can do readings. I think we can address the subject --

CHAIRMAN KATZ: Yes --

MS. RANDELL: -- in discussion and talk to Dr. Bailey about calculations.

MR. FITZGERALD: Right. In other words --

CHAIRMAN KATZ: That's what I meant --

MR. FITZGERALD: -- the August --

MS. RANDELL: Yes, we can do that --

MR. FITZGERALD: On August 16th, hopefully, we're going to have the results --

CHAIRMAN KATZ: Don't say hopefully, Mr. Fitzgerald --

MR. FITZGERALD: -- that will include -- that will include --

CHAIRMAN KATZ: -- or I'm taking you with me on my next trip up --

MR. FITZGERALD: -- specific underground construction of an identified type, and you want to get the EMF values for that --

CHAIRMAN KATZ: Yes. I'm assuming that in the August 16th report you're going to come in with a route, you're going to come with a type of cable that you are proposing with the underground. And we're just asking the EMF calculations for those undergroundings.

MR. FITZGERALD: I think that's a good point.

CHAIRMAN KATZ: Mr. Ball, did you want to be recognized?

MR. DAVID BALL: I did, thank you. Just on this point I think it might make sense to have calculations both at a burial of three feet but also at

deeper depths, perhaps eight feet as well since we know that has been discussed in this docket.

CHAIRMAN KATZ: Right. And that's something under discussion with DOT. So yes, that -- that would be reasonable.

MR. FRANK: If I could add to that, I think it might make sense also to have --

CHAIRMAN KATZ: Wait a second --

MR. FRANK: It also makes sense to have readings from -- if they place the cable in the middle of the road versus if they placed it underneath the sidewalk.

MR. FITZGERALD: Well --

CHAIRMAN KATZ: Well, we're calling them calculations, we're not calling them --

MR. FITZGERALD: That doesn't make any -- the profile would be the same, all you need to do is move the --

CHAIRMAN KATZ: Yes --

MS. RANDELL: I --

MR. FRANK: But if --

CHAIRMAN KATZ: But I think Mr. Frank makes a point that if you're putting something directly under a sidewalk where people are going to step over it as opposed to something under something else that people aren't

necessarily walking over --

MS. RANDELL: I think we understand the sense of the Council's inquiry and I think we'll be able to do it without doing -- you know, making sure that today we outline the 10 points to cover --

CHAIRMAN KATZ: Okay --

MS. RANDELL: -- we got it.

CHAIRMAN KATZ: So just to make sure I'm clear of what your testimony was, standing directly over an XLPE underground was 28 milligausses?

MS. BARTOSEWICZ: The table I was reading from was a segment of XLPE cable from Singer to Hawthorne. It had -- it was actually four cables, it went into Singer and back out of Singer. So that was a specific calculation for that part of the proposal.

CHAIRMAN KATZ: Okay. And so you're saying this is not typical, this is more underground cable than is typical?

MS. BARTOSEWICZ: It --

MR. ZAKLUKIEWICZ: Yes --

MS. BARTOSEWICZ: It was for four cables.

CHAIRMAN KATZ: Yes. Understood. Mr. O'Neill.

MR. O'NEILL: Madam Chairman, in the nature

of a follow-up field of inquiry, is it true, Dr. Johnson or Dr. Bailey, the highest EMF readings on an underground cable system would be at the splicing vaults? Is that a fair assumption?

DR. JOHNSON: If you're talking about exposure above ground, I don't -- I don't consider it like a fair assumption. I mean the fact -- depending on the type of cable, depending on the location, in your splicing vaults you can have workers go down in there and get closer proximity to the cable where you would have higher fields. If -- if the cable becomes closer to the ground as it comes into the splicing vault, then you could. If in coming into the splicing vault you have greater separation in the cables, you could possibly have higher magnetic fields over the splicing vaults. But to make the blanket statement that just because you have a splicing vault you're going to have a higher magnetic field without knowing the specific case, you really can't say.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: And I'll refer everybody to the House debate on the public act where they actually talked about the subject of EMF from underground.

MS. KOHLER: Dr. Bailey, the second type of magnetic field mitigation you discussed was what we call

split-phasing. And the example that you cite of real world split-phasing is the 115-kV line in western New York. Are there any examples that you know either in the United States or internationally of 345-kV split-phasing?

DR. BAILEY: I don't know of any, but as you saw from the demonstration that we did at 115 volts and the material we hear about at 115,000 volts, that the principle works irrespective of the voltage of the conductors --

MS. KOHLER: But to date, did --

DR. BAILEY: -- because we're talking about current flow.

MS. KOHLER: But to date there is no -- there's no system in place of a split-phase 345-kV?

DR. BAILEY: Not that I know of.

MS. KOHLER: And is there any system in place of a combination 115-kV and 345-kV split-phase system?

DR. BAILEY: I'm not sure about whether the phasing has always been optimized, but there are numerous examples of 115-kV and 345-kV lines on the same structure, and they may or may not have been optimized to produce that. I mean in some cases the companies may have done that just as a matter of course without making any kind of

announcement about it during the design stage.

MS. KOHLER: But -- so you're not aware of any?

DR. BAILEY: I can't point to a specific line and say that I know that this combination has been optimally phased.

MS. KOHLER: Okay.

CHAIRMAN KATZ: Mr. Zak, is split-phasing of a 345-kV something that ISO has to bless off on?

MR. ZAKLUKIEWICZ: Not to my knowledge.

CHAIRMAN KATZ: Have you asked, just so we're not surprised?

MR. ZAKLUKIEWICZ: I don't -- I think it is a construction matter and it has nothing to do with the reliability of the bulk power system. So I would not see them, ISO having a concern of whether a portion of the line is split-phased or conventional construction.

CHAIRMAN KATZ: Yes, okay. But you won't be insulted if we ask the ISO witness that just to be sure?

MR. ZAKLUKIEWICZ: No, there will just be a matter of cost recovery issues.

CHAIRMAN KATZ: Understood. Thank you.

MS. KOHLER: Can someone explain why the --

in some cases the 115 line seems to aid in EMF mitigation and in some cases it doesn't?

DR. JOHNSON: It's mainly due to the loading or the currents on those lines and the phasing of the 115 to the 345 line. To some extent, I think this gets back to your question of a 115 and a 345 line operating as a suit or like a split-phase line. Well, the 115 and the currents on it are helping to cancel the fields produced by the currents on the 345 line. Depending on the relative phasing and the magnitude of the currents on that 115 and 345 line, in some cases if the phasing is appropriate, so you're approaching like the split-phase arrangement, you actually get the currents from the 115 helping to cancel the currents on the 345 line or ultimately the fields. In other cases, the phasing of the 115 line may be such that instead of helping to cancel the fields on 345, you actually get an enhancement of the fields. Now in some cases of the 115 line you may have the current flow going in different directions; in one direction it will help cancel and the other direction it may enhance.

MS. KOHLER: And that criteria can change from segment to segment?

DR. JOHNSON: Because from segment to

segment you may have different lines on the corridor and so the currents and the direction of flows on those various lines will change from segment to segment.

MS. KOHLER: I understand that you can transition different types of split-phasing in different sections of the line. Is it possible to have split-phasing in one location for several hundred feet and then transition to a different type of split-phasing? For example, having in one section of the line split-phasing with no tower height increase and then move to split-phasing with tower height increase?

MR. ZAKLUKIEWICZ: For the description you've just provided, the answer would be -- I have split phasing with a 110-foot structure and now I'm going to split-phasing with a 150-foot structure --

MS. KOHLER: A hundred --

MR. ZAKLUKIEWICZ: -- was that --

MS. KOHLER: A hundred and --

MR. ZAKLUKIEWICZ: -- was that your question?

MS. KOHLER: A hundred and thirty-four --

MR. ZAKLUKIEWICZ: Whatever. A significantly --

MS. KOHLER: Correct --

MR. ZAKLUKIEWICZ: -- higher structure?

MS. KOHLER: Yes.

MR. ZAKLUKIEWICZ: The answer to that would be physically in most cases that can be done.

MS. KOHLER: And what other structures or equipment is necessary to accomplish that? What's the impact to the right-of-way?

MR. ZAKLUKIEWICZ: Well, the impact on the right-of-way would be of course the tallest structure as to be -- has to have a larger foundation and a wider base to it than a structure that is of lesser height. So it would primarily be in the size of the foundation for the structure or the monopole if that's what we're speaking of here, and of the amount of material in the monopole to take the weight of conductors higher up in the air.

MS. KOHLER: Do you need additional structures to make the transition -- that type of transition?

MR. ZAKLUKIEWICZ: If we were just going from a 110-foot structure to a 130-foot structure, I do not see a need for any additional structures at that location. They would just go -- not much different than you do when you go to a river crossing that is significantly higher than the surrounding land type

structures.

MS. KOHLER: Okay.

CHAIRMAN KATZ: Mr. Emerick.

MR. EMERICK: Mr. Zak, as you go to a higher structure, would your need for maintenance of the right-of-way width decrease?

MR. ZAKLUKIEWICZ: I do not see any appreciable difference in what we would require for vegetation clearing. It would depend on -- in some cases, as we do today, we would look at the tree species that are on that right-of-way at that location. If certain tree species can get up at 60 or 70 or 80 foot, the bottom conductor is still going to be the driver as to what our need for clearance is, Mr. Emerick.

MR. EMERICK: Okay, thank you.

MS. KOHLER: Dr. Bailey, on page 7 of your prefiled testimony you note that the values that you provided in Exhibit 1 were representative of existing and probable future conditions -- sorry -- but you indicate that the analyses did not incorporate assumptions about certain other conditions. And one of those input conditions is, quote, "other loading conditions". Can you explain what those other loading conditions are that weren't included?

DR. BAILEY: What I was referring to is that the modeling of the magnetic fields for the average and peak cases considered specific load flows for the 15-gigawatt case and the 27.7 gigawatt case for those lines on the proposed right-of-way. And we did not look at, you know, what would happen if all of a sudden one of those lines went out of service or if -- you know, variations on those load flows other than those typical cases.

MS. KOHLER: Okay. In reference to Exhibit 2, we had some earlier discussion about the definition of a neighborhood. And you don't make any assertion that this definition is what was proposed or intended by the statute?

MS. BARTOSEWICZ: No, we do not.

MS. KOHLER: And in fact, there might be other residential areas that could be considered a residential area given a different definition?

MS. BARTOSEWICZ: The Siting Council has the authority to determine what that should be.

MS. KOHLER: And in defining residential areas, you triggered the measurements off of actual homes and not the backyards that may abut the right-of-way or -- or --

CHAIRMAN KATZ: What's the difference?

MS. KOHLER: I think if they triggered the measurement off of the home, the home might be 200 feet away from the right-of-way or 400 feet from the right-of-way --

CHAIRMAN KATZ: Oh, I see --

MS. KOHLER: -- but the actual backyard abuts the right-of-way, the pool abuts the right-of-way.

CHAIRMAN KATZ: Right. Can you --

MS. BARTOSEWICZ: Well --

CHAIRMAN KATZ: -- clarify where the 300 was to?

MR. CRETELLA: The way the -- I'll call it a rule of thumb, I wouldn't call it necessarily a definition -- the rule of thumb was that we looked at an area that extended 300 feet out from the edge of the right-of-way and extended for a length of 2,000 feet along the right-of-way. And if there were a group of homes -- and we didn't necessarily specify how many -- if there were a group of homes that fit into that category and the property lines associated with those homes abutted the right-of-way, they were included as a buffer statutory facility adjacent to the right-of-way. So there had to be a common property abutting of the right-of-way border with the property lines associated with the homes.

CHAIRMAN KATZ: So if there was a street abutting the right-of-way and a house across the street, would that be counted or not counted?

MR. CRETELLA: That would not be counted because the property lines did not abut or are adjacent to the right-of-way.

MS. KOHLER: If there was a house that was 500 feet out of the right-of-way or a group of houses that were 500 feet out of the right-of-way, is it accurate then they would not have been included?

MR. CRETELLA: That is correct.

MS. KOHLER: Okay.

MS. BARTOSEWICZ: Uh --

MR. CRETELLA: Outside of -- if a group of -- the houses have to be within the 300 feet, okay.

MS. KOHLER: So there -- there may be many properties in which the house was just outside of that 300 feet, but in fact the entire backyard is within the 300 feet but yet it was not considered to be a residential area?

MR. CRETELLA: That is correct. Again, that was our rule of thumb that we tried to use to identify what a residential area is that is adjacent to the right-of-way.

CHAIRMAN KATZ: Now, you chose that as sort of your final definition, but did you map any other scenarios of others that you worked with?

MR. CRETELLA: No, we did not.

CHAIRMAN KATZ: Okay.

MS. KOHLER: And Dr. Bailey, if you could just -- on your Exhibit 2 -- I'm also going to ask you to look at Exhibit 41, which was your responses to AG-14, dated January 22, 2004 --

DR. BAILEY: I'm not sure I have that. Could someone provide that response to me.

MS. KOHLER: It's AG --

DR. BAILEY: One moment --

MS. KOHLER: Exhibit 41, AG-14.

CHAIRMAN KATZ: Do you want to wait or do you want to ask something else while they're looking for it?

MS. KOHLER: Uh --

CHAIRMAN KATZ: Your choice?

MS. KOHLER: -- I think I'm actually done --

CHAIRMAN KATZ: Okay, we'll wait a moment then.

DR. BAILEY: Was that AG-14? Correct?

MS. KOHLER: AG-14 --

DR. BAILEY: Okay --

MS. KOHLER: -- it's dated January 22, 2004.

DR. BAILEY: Okay.

MS. KOHLER: In Exhibit 2 to Exhibit 124 you list the Eisenhower Park ballfield at the very bottom of that table. It's the very last line, it's ID No. P-48.

DR. BAILEY: Yes.

MS. KOHLER: And if you go across that row, it references the park ballfield, it talks about the -- under measurements of fields from existing transmission line and other sources, it notes that it's 20 -- the measurement distance is 24 feet. And then if you move over to the -- under the calculated field section, it lists the proposed magnetic field as being 1.5 average load and 4.6 peak load.

DR. BAILEY: Um-hmm.

MS. KOHLER: If you now go to the response to AG-14, which is Exhibit 41, it lists in the third row Eisenhower Park playing field bleachers the same thing, it says measurement distance from the right-of-way 24 -- under the measurement section. And then if you move over to the calculated field section, it says an average load

of 9.8 milligauss and a peak load of 34 milligauss. The peak load for Eisenhower Park ballfields that were given in response to AG-14 is almost seven and a half times the EMF level that is included in Exhibit 2. I'm just hoping you can help me to navigate through that and understand it?

DR. BAILEY: There are a variety of factors that explain the differences. One is that there is -- the softball fields referred to in P-48 correspond in AG-02 response to Facility No. 21 where it says softball fields --

MS. KOHLER: Um-hmm --

DR. BAILEY: -- so there's two different locations being referenced. Another difference is that the measurement distances may not be the same. And also the third consideration is that this section -- if you'll see Cross-Section 8, at that time the finer discrimination of the type of facilities within that cross-section and loadings for those subsections of the cross-section had not been made. And as you can see on Exhibit 2, it is Cross-Section 8 south --

MS. KOHLER: Um-hmm.

DR. BAILEY: -- so it is a subsection of what was included in 8, and that in itself could give you

a very substantial difference in the calculated fields even at the same distance from the lines.

MS. KOHLER: If you look at your Exhibit 2, Eisenhower ballfield, you'll agree that if you look under measurement distance from right-of-way, it says 24 --

DR. BAILEY: Um-hmm.

MS. KOHLER: -- which is the same as AG-14, and if you look under magnetic field, it says 4.6, which is the same as the magnetic field that's indicated in that table. The one that -- the one that you said that is lieu of the softball fields actually contains no information.

DR. BAILEY: Okay. The -- the measurement was not retaken. The measurement in Exhibit 2 was the measurement value that had been taken by the companies for the AG-02 response, but the distances at which the calculations were made was updated for Exhibit 2.

MS. KOHLER: Can you tell me where the distance it was taken from the AG-14 response, or can someone on the panel?

DR. BAILEY: The measurement value, I'm told it was -- that we were provided for this facility was not made at the same location, a second set of measurements were made -- no, I'm sorry -- that the measurement values for Exhibit 2 were the same values that

were given in response to AG-02, but the calculation distances and locations were updated.

MS. KOHLER: Where was -- in the AG-02 response where -- what was the distance that was used for the AG-02 -- the AG response?

DR. BAILEY: The nearest portion of the softball field is further away from -- than where the measurement location was made. So if the measurement value here, 24 feet from the distance, obviously it would explain why that -- among other things I already discussed, why that measurement value would be higher than a measurement that would be taken much further away or a calculation made at a further distance. That is the measurements and the calculations may not always refer to the same physical location.

MS. KOHLER: I don't want to belabor the point, but I really want to understand this because I'm sure that you know that the residents are very concerned about making sure that these numbers are right. In both tables --

(Indiscernible voices in background)

MS. KOHLER: In both tables the measured distance is indicated as being 24. In both tables --

DR. BAILEY: That's correct.

MS. KOHLER: In both tables the magnetic field calculations -- the magnetic field level for the measurement is 4.6?

MR. CRETELLA: Dr. Bailey --

DR. BAILEY: The measured value.

MS. KOHLER: Right.

MR. CRETELLA: If I may clarify. There are two distances that are included in these tables --

MS. KOHLER: Um-hmm.

MR. CRETELLA: -- the once distance that's labeled measurement distance is the distance where the physical person stood relative to the right-of-way to take the measurement. That may or may not be the same as the distance that was used to perform the calculation of the magnetic fields under the various conditions --

MS. KOHLER: I understand that --

MR. CRETELLA: You understand that, okay --

MS. KOHLER: -- that the distance to the right-of-way for the calculated fields may be different than that -- than the measured fields than you did in the office. And what I'm confused by is where it says Eisenhower Park ballfield, it gives one set, it gives the 1.5 average and 4.6 at peak. In response to the AG's response, it says Eisenhower Park playing field bleachers,

the same ballfield --

MR. CRETELLA: No, no, one is the bleachers and the other is the ballfield.

MS. KOHLER: It says bleachers/playing field. I'm assuming that's the bleachers at the playing field?

MR. CRETELLA: Correct.

MS. KOHLER: It says 9 point -- 9.8 and 34 milligauss. So there's a seven and a half times milligauss level at peak load than what is being anticipated now.

MS. BARTOSEWICZ: Chairman Katz --

CHAIRMAN KATZ: Yes?

MS. BARTOSEWICZ: -- can we use the afternoon break --

CHAIRMAN KATZ: Yes, I think that's an excellent suggestion --

MS. BARTOSEWICZ: -- so we can provide Miss Kohler the correct answer --

CHAIRMAN KATZ: Right. What I'd like you to do is perhaps during the 3:00 o'clock break that we -- that you agree on an exact ground true location and then they will get you an answer of what the milligauss is calculated to be at that location. I think it will help

on the confusion.

MS. KOHLER: I hope so.

CHAIRMAN KATZ: Yes.

MS. KOHLER: Dr. Bailey, in your prefiled testimony, finally, you talk about other options to mitigate EMF and that they might be site specific. Assuming that the 3-foot tall 2-by-4 that was done this morning is not possible for Milford, are there any other possibilities that you'd like to -- that are available for the towns?

CHAIRMAN KATZ: I saw that one coming.

DR. BAILEY: Well, we haven't been able to shrink a facility to the size of our model, maybe that's coming in the future.

At any particular location, obviously the -- you can take the option designs and try and make further site specific refinements. So it may involve -- if 115's had not been proposed on a particular section and are being taken off the right-of-way and placed underground, that could be done. It could be that at a particular site it might be possible to adjust the separation of the phases on proposed and existing lines to achieve greater field reduction. There are a variety of different things that in a site specific -- in a particular location one

should know what is available in terms of right-of-way and what kinds of fields you're trying to reduce at that location that you might be able to add to the basic designs that were outlined in the presentation this morning.

CHAIRMAN KATZ: Dr. Bailey, does vegetation have any effect if it's between the person and the line or is it basically the EMFs just go right through vegetation?

DR. BAILEY: Only -- the magnetic field would not be affected by the presence of vegetation, but the electric field may well be effectively blocked by the presence of trees, shrubs, vegetation, and metallic fences and buildings.

CHAIRMAN KATZ: Okay.

MR. O'NEILL: Mr. Bailey, under full load as the wire sags and comes closer to the ground, wouldn't the EMFs be changed at those points as opposed to the top of the structures?

DR. BAILEY: The field levels where the conductors are closest to the ground would be higher than they would be closer to the tower and the line heights that we have assumed for the -- that Dr. Johnson used in his modeling was at the point of lowest sag, where they were closest to the ground.

MR. O'NEILL: So by further enhancing the design by placing those poles, we can further address the issues as far as positioning them in proximity to residential areas and day care centers as well, can't we?

DR. BAILEY: Yes. That could have particularly a relatively larger impact for residences closest to the right-of-way. If they're very far from the right-of-way, then that may have less of an impact.

MR. O'NEILL: Thank you.

MR. EDWARD S. WILENSKY: Madam Chairman.

CHAIRMAN KATZ: Yes, Mr. Wilensky.

MR. WILENSKY: Dr. Bailey, to have an adverse reaction to we'll say EMF, does there have to be long-term exposure or could somebody just walk underneath it and have none or less than somebody that's living nearby, or does it matter, or am I explaining it properly?

DR. BAILEY: The scientific literature does not provide a basis to determine that at the levels that we encounter in our environment whether it's the, you know, 40 or 50 or a hundred milligauss in a grocery store or the 10 milligauss near an appliance in a home, or half a milligauss from the currents flowing in your water pipes. We don't have a basis for the fields from this transmission line -- we don't have a basis to determine

that any of these values are, in fact, posing a health risk.

MR. WILENSKY: Okay. Thank you, Dr. Bailey. Thank you, Madam Chairman.

MS. KOHLER: I have nothing else, Thank you.

CHAIRMAN KATZ: All set? Thank you. Is the Town of Orange represented here today?

A VOICE: Yes.

CHAIRMAN KATZ: Yes. And then Mr. Boucher, you're after that.

MR. EMERICK: (Indiscernible) --

CHAIRMAN KATZ: Yes, Mr. Emerick, we'll give the floor to you.

MR. EMERICK: Before I forget it, Dr. Johnson, you had mentioned on one of the mitigations, and perhaps I heard you wrong, but I heard two techniques that -- I don't know what they are -- and I think you mentioned looping and -- was it modified looping? Could you explain what those are and if they have any application?

DR. JOHNSON: Probably an active loop or a passive loop.

MR. EMERICK: That was it, thank you.

DR. JOHNSON: Basically, that's where you

string a conductor around a certain area. And an active loop is where you're actively injecting current into it, driving current through it. The amount of current that you're actively injecting many times is determined by some remote sensor to determine the level and the amount.

Passive loop is a similar type concept where you have a current in a loop of wire, but that current and the amount of it is being induced by the magnetic field that's there already. Now to accomplish this, typically for the passive loop you need very large conductors. Typically, bundled conductors are two to four inches in diameter, along with typically capacitors to help set the phase angle in order that you get optimum cancellation, basically to get the most benefit out of the current that you're driving through the conductor and the field that it produces versus the field that you're trying to cancel. In the sense of doing this you've got the flip side that you may get the benefit at one location where this loop is going, but at some other point you've got the other side of the loop for it to come back around. And at that other point it's more difficult to control actually the field that you get, you may actually enhance the field at that other location, wherever the loop is coming back.

So usually with the loop type technology

they're active or passive, you have some drawbacks with it where on one side you get a benefit, at the other side you basically get an enhancement or a negative benefit.

MR. EMERICK: Where would you use this?

DR. JOHNSON: Usually where you have the active loops, it may be like around a -- typically, I've seen it around computer monitors where you want to reduce the specific field at the monitor, in some cases roughly room size, so that in the center of the room you may get a reduced field, but wherever that wire loop is running, as you get close to it you're going to have an enhanced field. So you generally use it where you have a specifically targeted area that you want to reduce the field.

MR. EMERICK: So this has no application in terms of transmission then really?

DR. JOHNSON: It's a bigger -- a bigger canvas. Probably not the active loop. Passive loop, that's -- it's really site specific. You could not rule it out probably completely, but it's not an easy generic type fix.

MR. EMERICK: Well, nothing has been easy, so -- we're past that point.

CHAIRMAN KATZ: Well let's leave it at this

point --

MR. EMERICK: Yeah.

CHAIRMAN KATZ: If you feel that it has an application to this docket, please get back to us.

DR. JOHNSON: Okay. A homework assignment, right?

CHAIRMAN KATZ: You got it. Mr. O'Neill.

MR. O'NEILL: Dr. Johnson, do you see any new generation of conductors which are lower in EMF fields than transitionally used conductors?

DR. JOHNSON: If the conductor per say carries current, then it's going to produce a magnetic field.

MR. O'NEILL: Yes, but are there new types of conductors which are lower in field?

DR. JOHNSON: If that conductor is carrying the same level of current, it's not going to have a lower field.

I think possibly you may have heard on the popular media something like low field conductors. If you've got a conductor that's carrying a thousand amps, it will produce the same magnetic field as any other conductor carrying a thousand amps. The only thing that I can possibly see in their argument is that their conductor

may sag a little bit less than a traditional one, therefore it stays a little bit further away, it doesn't come quite as close to the ground for the same amount of current going through it. And because of that, the field at ground level is a little bit less, but we're probably only talking maybe a few percentage points difference, and that's directly underneath the conductor.

MR. O'NEILL: Thank you.

COURT REPORTER: One moment please. (Pause). Thank you.

CHAIRMAN KATZ: Mr. Stone.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Yeah.

MR. BRIAN STONE: Yes, thank you. Brian Stone for the Town of Orange.

Dr. Bailey, I believe it was you that testified that you can have different benefits on different segments based upon the conditions from a split-phase line. Is that accurate?

DR. BAILEY: I'm not sure what you mean by different benefits. Do you mean different --

MR. STONE: Well, you'd have different cancellation --

DR. BAILEY: Right, the split-phase design

may produce different fields at the edge of the right-of-way in different cross-sections.

MR. STONE: Is -- is -- can the split-phase have different fields within the same cross-section at varying points of time because of changing conditions that occur on the lines?

DR. BAILEY: I'm not sure exactly -- are you saying will the -- will the split-phase work no matter what -- they will be operating no matter what the low level is?

MR. STONE: Well, I --

DR. BAILEY: That may differ from one cross-section to the other.

MR. STONE: I understand that, but let's assume that you design and build a split-phase system. That's going to have a certain configuration within the field and that's going to be based upon a certain set of criteria and calculations that you've done. If the reality of what happens is that there are -- and I assume this is accurate, that there are changes in loads, changes in currents, things that occur in the normal -- either in the normal course or in the extraordinary course where there is an outage, will that change the benefit, i.e. the split-phase cancellation that has occurred at a particular

point along a segment?

DR. BAILEY: Probably no more so than any other circuit. And I would point out that the -- that the split-phase structure in the 345-line that is proposed, that performance for that line is relatively constant, and that much of the variation that you see between cross-sections reflects not so much the variations in what's happening with the split-phase line, but it's happening with the lines that are running on the corridor next to it.

MR. STONE: Fair enough. I have a question concerning structures or significant structures, houses, schools, etcetera, that are located within the right-of-way. There was some testimony that there are a number of structures which -- that you could not determine from the aerials whether or not they were in the right-of-way. Can I ask how many of those structures -- do you have a number as to how many structures there are that fit that category?

MR. WELTER: We don't have an exact number, no.

MR. STONE: Can you -- can you -- is it determinable what that number is or is it your intention to determine what structures are actually within the

right-of-way to do those calculations?

CHAIRMAN KATZ: Now when we use the word structures, we're using the sheds, swimming pools --

MR. STONE: No, I'm using the -- excuse me, significant structures.

CHAIRMAN KATZ: Okay. I think we already had testimony there were no significant structures in the right-of-way. Can someone clarify that?

MS. BARTOSEWICZ: Correct. We said that there were no houses, buildings, schools in the right-of-way.

CHAIRMAN KATZ: Okay.

MR. STONE: I -- I don't -- I don't think that that's -- that that was the testimony. I thought the testimony was --

CHAIRMAN KATZ: Well, that's what I heard.

MR. STONE: I --

MR. FITZGERALD: Well --

MR. STONE: Go ahead.

MR. FITZGERALD: Actually, I heard something slightly different and perhaps we ought to --

CHAIRMAN KATZ: Okay, can we have a clarification --

MR. FITZGERALD: -- let Mr. Welter say it

again.

MR. WELTER: The point is there are some that are at the margin that may be -- what I said before was plus or minus five or ten feet in trying to apply this right-of-way to an aerial photo and look at that, and that they could only be determined by surveying. We don't think there's any entire buildings in there that's for sure.

MR. STONE: There -- there are some buildings that might -- am I correct that there are some buildings that might be in the right-of-way --

MR. WELTER: Might --

MR. STONE: -- but you just can't make that determination one way or the other because --

MR. WELTER: The edge of the building may or may not penetrate that, we're not positive.

CHAIRMAN KATZ: But don't -- isn't it fair that the company probably has an existing program in place now for all transmission lines to get significant structures out of the right-of-way or do you wait until there's a problem?

MR. ZAKLUKIEWICZ: Encroachment has been an ongoing problem. Legally there are arguments made when we have an encroachment that the facility has been there for

a number of years, thereby you allowed it and don't make the owner now remove it.

CHAIRMAN KATZ: Yeah.

MR. ZAKLUKIEWICZ: Clearly where there is a building being built, and we've had this before, where foundations have been laid, we have stopped construction where we recognized it was in the right-of-way.

CHAIRMAN KATZ: Yeah.

MR. ZAKLUKIEWICZ: But our control over garages, sheds, swimming pools, in some cases decks, or extensions of decks around swimming pool areas in particular are a problem. Before we do our survey, they're already there.

CHAIRMAN KATZ: Yeah. Mr. Stone, did you have a specific structure in Orange that you want to pursue --

MR. STONE: Well, I --

CHAIRMAN KATZ: -- that the Council should know about?

MR. STONE: My next question was how many of these potential structures are there in the Town of Orange that might be within the right-of-way. But I can tell that since we don't know how many there are, we're not going to know the answer to that question either --

CHAIRMAN KATZ: Okay --

MR. STONE: -- but I certainly would like to know that -- or actually not how many maybe, but how many actually are.

CHAIRMAN KATZ: Well if at some future point you come back with a specific structure in mind in Orange that may be in the right-of-way, then we'll -- why don't we pursue it at that point.

MS. BARTOSEWICZ: Chairman Katz, just so we all know, you know, in order to truly determine that, you would have to -- there would have to be survey work done --

CHAIRMAN KATZ: Right --

MS. BARTOSEWICZ: -- so that's --

CHAIRMAN KATZ: -- yeah --

MS. BARTOSEWICZ: Just so we're all on the same page.

MR. ASHTON: I think, Madam Chairman, it would be helpful if there was a specific question about a structure, and the Town go to the utility and ask -- and work it out on that basis.

CHAIRMAN KATZ: Right.

AUDIO TECHNICIAN: Mr. Ashton, could you just move that microphone --

MR. ASHTON: For the Council to make a determination of whether it is or isn't --

CHAIRMAN KATZ: Right --

MR. ASHTON: -- I think it would be --

MR. STONE: I don't --

MR. TAIT: My --

MR. STONE: -- I don't know if there are any at issue --

CHAIRMAN KATZ: Okay --

MR. STONE: -- because I just heard the testimony today, but I will inquire and ask --

MR. TAIT: The homeowners may not want that because in my town there are things built there that they never tell the building inspector, particularly swimming pools, sheds and porches --

MR. ASHTON: And the assessor --

MR. TAIT: -- do-it-yourself gets many things beyond the town's knowledge.

MR. STONE: It sounds like my town too. Thank you, I have no further questions.

CHAIRMAN KATZ: Thank you. I think this is a good time to take our break. During the break I ask that the witnesses look into that Eisenhower Park thing and we'll have a report back after the break. And let's

resume at 3:10.

(Whereupon, a short recess was taken.)

CHAIRMAN KATZ: In a moment we're going to have Dr. Bailey report on Eisenhower Park, but I want to throw out just a hypothetical perhaps so you can report back on -- my famous hypotheticals --

A VOICE: (Indiscernible) -- they're cringing --

CHAIRMAN KATZ: Yes, I know. This is where we get out the defibrillator.

If, hypothetically, the buffer zone -- the Health Department mentioned that there is no safe level of EMFs, but they mentioned -- one of the numbers they mentioned as a -- it was three milligausses. If the buffer zone was -- the edges were three -- had to be three milligausses or less, do you have an idea of how many -- what are we calling them, statutory --

MS. RANDELL: Facilities --

CHAIRMAN KATZ: -- facilities --

MS. BARTOSEWICZ: Adjacent to the buffer zone --

CHAIRMAN KATZ: -- adjacent to the right-of-way -- adjacent to the buffer zone would be impacted?

MS. BARTOSEWICZ: We can -- we can do that

look for you.

CHAIRMAN KATZ: Okay. And we'll talk about that tomorrow? Would that be possible?

DR. BAILEY: No --

MR. CRETELLA: No --

(Laughter)

DR. JOHNSON: No --

MS. RANDELL: That was a joke --

(Multiple voices overlapping, indiscernible)

CHAIRMAN KATZ: We'll talk about that in the future.

MR. FITZGERALD: And --

CHAIRMAN KATZ: Yes?

MR. FITZGERALD: Recently Dr. Ginsberg testified in another proceeding and he was asked to characterize the testimony that he gave to the Siting Council --

CHAIRMAN KATZ: Yes --

MR. FITZGERALD: -- and he once again used -- and I don't mean to subscribe to this, but he used the 6 milligauss figure as being -- he gets there by multiplying 3 by 2 --

CHAIRMAN KATZ: Two-fold is what he

testified to us -- 6 milligausses was a two-fold 3 milligauss reading. If you'd like to present something at 6 milligausses, we'll --

MR. TAIT: Why not do them both --

CHAIRMAN KATZ: Do both.

MR. TAIT: Would it be double the effort or while you're --

MR. FITZGERALD: Well -- yeah, I mean once -- it's -- yeah, it's a big -- it's --

MR. TAIT: Okay --

MR. FITZGERALD: Well --

A VOICE: (Indiscernible) --

MR. FITZGERALD: -- no, that can be done because it can be done for the proposed route because we've given you that table already that has -- that has values at 15 --

CHAIRMAN KATZ: Yeah --

MR. FITZGERALD: -- and we also have -- so that could be done almost overnight --

CHAIRMAN KATZ: Okay --

MR. FITZGERALD: -- I think.

CHAIRMAN KATZ: Well, we'll give that as a homework assignment and we'll ask you to do 3 milligausses. And if you want to do another case, feel

free. Yes?

MR. KENNETH ROSENTHAL: Chairman Katz, Ken Rosenthal --

CHAIRMAN KATZ: Yeah, can we get your mic up -- just a second, Mr. Rosenthal --

MR. ROSENTHAL: -- representing the Woodbridge educational organizations --

CHAIRMAN KATZ: Yes --

MR. ROSENTHAL: -- Ken Rosenthal. When this calculation is being done, there's going to be testimony from Dr. Bell tomorrow, it's in our submitted testimony I guess, that .6 milligauss is the ambient background at which this should be -- that that's what the buffer zone should provide. So if there's going to be a calculation done, it's our position that there should be a calculation done on that as well so we can see -- so that the Siting Council will have data that we'll be able to compare with what we're talking about if that in fact is the proper level, and there's evidence from which you may conclude that.

CHAIRMAN KATZ: Okay, so you're making that request of the Applicant?

MR. ROSENTHAL: I am.

CHAIRMAN KATZ: Mr. Fitzgerald.

MR. FITZGERALD: Well, my -- maybe -- my client can correct me if I'm wrong here, but I think what we have given you in Dr. Bailey's testimony, Exhibit 2 has calculated magnetic field values at the 15.5 -- at the 15-gigawatt case at each of the statutory facilities that we've identified. Now, with those values one can look at the numbers and see how many of them are above 3 or how many are above 6 or how many are above .6, it's there. So --

MS. BARTOSEWICZ: I mean I --

MR. FITZGERALD: Isn't that right?

MS. BARTOSEWICZ: Correct. If you look at Exhibit 2, I can walk you through the table and it's easy to identify the statutory facilities adjacent to the buffer zone on the proposed route. We can walk through Dr. Bailey's Exhibit 2 and it's easy to identify which ones are at or below the 3 milligauss and which one's aren't. So that information is contained in this document.

MR. ROSENTHAL: At what -- is that at the 15-gigawatt load?

A VOICE: Yes. And --

MS. BARTOSEWICZ: Yes, it is --

MR. ROSENTHAL: Well, that's the problem --

A VOICE: And --

MS. BARTOSEWICZ: And -- and at the 27.7. You can find both pieces of information on Exhibit 2 of Dr. Bailey's testimony.

CHAIRMAN KATZ: Mr. Rosenthal, what I think I'm going to do is I'm going to take your request under advisement and we'll wait until after tomorrow's testimony.

MR. ROSENTHAL: Great.

MS. BARTOSEWICZ: So what I could probably do tonight is just look at this chart and add up the numbers and give you a report in the morning.

CHAIRMAN KATZ: Thank you. Okay, at this point before we resume cross-examination, Dr. Bailey, if you want to report back on Eisenhower Park. Were you able to come to a consensus on -- are you talking about apples and apples now?

MS. RANDELL: Madam Chairman --

CHAIRMAN KATZ: Yes? Miss Kohler, I'm going to ask you if you want to come back up too. Yes?

MS. RANDELL: Dr. Bailey will start and then Mr. Cretella --

CHAIRMAN KATZ: Fine --

MS. RANDELL: -- can pick up --

CHAIRMAN KATZ: Great --

MS. RANDELL: -- with maps.

CHAIRMAN KATZ: Okay.

MS. RANDELL: And for those who are following at home, it's Segment 42 on the 1 to 400's.

CHAIRMAN KATZ: Okay. Miss Kohler, you can sit over here if you'd rather.

MS. KOHLER: Oh, thank you.

CHAIRMAN KATZ: Okay. So Dr. Bailey, I'm going to ask you to give a report, and then if Milford has a follow-up question, we'll allow that. Okay?

DR. BAILEY: Yes.

CHAIRMAN KATZ: The both of you can give a report.

DR. BAILEY: The first point I would like to make, as I had said before, is that the locations where measurements were made is a different reference point than where calculations were made. In order to understand all of the references to this ballfield, you have to go back first to Attorney General -- response to a Attorney General request, AG-01, and in that response it identifies a distance to the edge of the right-of-way of zero feet. And that was later referenced in AG-02 as the locations where calculations were made. So the calculations in AG-

02 were made at zero feet from the right-of-way. And we're talking about an area identified as playground in AG-01 or bleachers/playground in AG-02 which is on the northwest side of the right-of-way, and that's in Segment 42.

In Exhibit 2 the reference in P -- Facility P-48 for ballfield now is defined by the statute. And so this distance was on the south edge of the right-of-way to a ballfield where the -- essentially the homerun fence was closest to the edge of the right-of-way, and that was 175 feet from the right-of-way. So with regard to AG-02 and AG -- and Exhibit 2, there are differences in terms of distance from the right-of-way, there are differences on which side of the right-of-way they are.

CHAIRMAN KATZ: Where in Eisenhower Park is the peak milligauss?

MR. CRETELLA: The peak -- the right -- the right-of-way passes through --

DR. BAILEY: The peak is on the right-of-way --

MR. CRETELLA: -- it's going to be directly under the lines.

CHAIRMAN KATZ: I'm sorry, I didn't ask the question -- what is underneath the lines at the peak,

directly underneath the lines?

MR. FITZGERALD: You mean at the peak load?

CHAIRMAN KATZ: Yes -- no, I'm saying --

MR. TAIT: What facility?

CHAIRMAN KATZ: What facility is directly under the lines? We're assuming that the lines have the highest directly underneath --

MR. FITZGERALD: Okay --

DR. BAILEY: The --

CHAIRMAN KATZ: What is --

DR. BAILEY: The right-of-way passes sort of -- you know, there's -- there's this large park and there are facilities within the park and it bypasses to the north, it bypasses the softball field, and there are other facilities to the south. And then it goes through an area that -- when we were out there, there were some bleachers and we saw someone riding through the park on horses. And it's just an open area. And at the time we took those measurements for AG-01, we had used data that we had taken as part of preparation for the application. So the highest fields would be on the right-of-way that runs through this park. In terms of the values that are shown in these tables, the highest values would be those used for calculations in AG-02 at the edge of the right-

of-way.

MS. BARTOSEWICZ: Chairman Katz, let me try something else. Exhibit 1 to Dr. Bailey's testimony -- and one of the reasons we did it this way was so no matter where you wanted to -- where you wanted to be or where you thought you were going to be and you wanted to know what the magnetic field was, you could go to this table if you knew how many feet you were away from the edge of the right-of-way --

CHAIRMAN KATZ: Okay --

MS. BARTOSEWICZ: -- and you could figure it out. So that we knew there were hundreds and hundreds of places where somebody might want to know where you were and what the field would be. So if you go to his -- if you go to Exhibit 1 of his testimony and you look at cross-section -- 8?

DR. BAILEY: 8 South.

MS. BARTOSEWICZ: 8 South, which is page 26 of 26, you can see those tables provide you calculations for both existing, proposed, and the two EMF mitigation options that we showed this morning, and one can determine from this chart, however far you are from the edge of the right-of-way, any place in the park you can figure out what the magnetic field level would be.

CHAIRMAN KATZ: Okay. Miss Kohler, did that help?

MS. KOHLER: It does. Let me just say two things in response to that. (1) I think -- and when you talk about what is under the right-of-way or what's near the right-of-way -- as you may know, Eisenhower Park is the largest open space area in Milford and I believe during the municipal consultation period the Applicants were advised that the Eisenhower Park Committee is proposing day camps, a children's day camp, a swimming pool, a kiddy pool, and to make further use of the park.

And secondly, in regard to this issue about the softball fields, Mr. Cretella and I spoke about it, and let me tell you what the issue is and let me tell you what the resolution is. When they did AG-2 --

CHAIRMAN KATZ: Maybe we need him to testify what that is.

MR. FITZGERALD: I think -- well, he can say -- she can make a statement and then he can confirm it.

CHAIRMAN KATZ: Okay, fair enough.

MS. KOHLER: When the companies did AG-2, they identified two spots in Eisenhower Park, the first being Eisenhower Park bleachers/playing field and the

second being Eisenhower Park softball fields, park/playground. Eisenhower Park, the first one -- let's say Eisenhower Park 1 and Eisenhower Park 2 -- Eisenhower Park Location 1 they did apparently at the edge of the right-of-way because that ballfield is closer to the right-of-way. Eisenhower Park 2 they note in the AG's table measurement recorded Eisenhower Park at a closer location, see location 20. So they decided not to do measurements at the second location, the 175-foot location because there was a ballfield that was closer to the line. When they completed Exhibit 2 to Dr. Bailey's testimony, they did the Eisenhower Park ballfield that was 175 feet away from the line because they concluded or made a determination that the one that was closer to the line was not a facility under the statute.

I think we have a disagreement as to whether it is a facility or not a facility. I think the ballfield is a facility and I think -- I disagree with the conclusion. However, Mr. Cretella has agreed to do -- to provide calculations for that other Eisenhower Park location as well.

CHAIRMAN KATZ: Okay.

MS. BARTOSEWICZ: And my comment is you have that calculation already --

MR. CRETELLA: You have the calculation --

MS. BARTOSEWICZ: -- page 26 of 26 of this exhibit provides you with that information.

MS. KOHLER: I understand that, but given the sensitivity of that area and the fact that I at least consider it to be a facility and think it is within the statute, I think that rather than basing that on a 12-mile segment, the City of Milford would prefer to have a site specific calculation done. And I think you've agreed to do it, so I don't have an issue with --

CHAIRMAN KATZ: Okay. How is CL&P interpreting playgrounds from the statute? Not including ballfields?

MR. CRETELLA: No, the -- the way we've attempted to identify what are characterized as public playgrounds in the statute was that they had to be a facility that is non-private, i.e. open to the public, and that it must possess equipment or facilities where children would or could congregate, i.e. jungle gyms, see-saws, swings --

CHAIRMAN KATZ: Bases --

MR. CRETELLA: -- a ballfield --

CHAIRMAN KATZ: Bases --

MR. CRETELLA: -- an active ballfield.

CHAIRMAN KATZ: Okay. And your -- it's your testimony that this is not an active ballfield?

MR. CRETELLA: It -- in our opinion the facility that was measured in AG-02 is not an active ballfield.

CHAIRMAN KATZ: Okay. It's an inactive -- well, how would describe it --

MR. CRETELLA: Well, if it has --

CHAIRMAN KATZ: -- is it an inactive ballfield?

MR. CRETELLA: If it has a backstop around it and it has bases and it looks like the grass is mowed and that people have used it, we would consider that to be an active ballfield.

CHAIRMAN KATZ: Okay.

MR. CRETELLA: The other facility where the bleachers are where the original measurements were taken is not in that condition.

CHAIRMAN KATZ: What are the bleachers serving if they're not serving a ballfield?

MR. CRETELLA: The last time I was there, it looked like the bleachers were sitting out in the middle of opened mowed grass.

CHAIRMAN KATZ: Okay. Why don't at some

point we get some photos so that at the point if the Council has to determine if this is a statutory facility or not, maybe that will be helpful, okay.

MR. ASHTON: Mr. Cretella, in your definition of a public facility does seasonal use come into it as opposed to year-round use?

MR. CRETELLA: Could you be a little more specific --

MR. ASHTON: Okay --

MR. CRETELLA: -- in what you're referring to?

MR. ASHTON: Let's assume just for --

A VOICE: Ice-skating --

MR. ASHTON: Yeah, an ice-skating rink on one hand --

CHAIRMAN KATZ: Right --

MR. ASHTON: -- versus a track on the other --

MR. TAIT: A swimming pool --

MR. CRETELLA: No --

MR. ASHTON: -- where a track presumably gets use year-round or close to it versus the ice-skating rink, which gets use for those months where you can freeze -- the ice freezes -- or water freezes?

MR. CRETELLA: In our interpretation of this we did not encounter anything like ice-rinks or tracks that were adjacent to the right-of-way. The only facilities that we did identify that were close enough were -- or to be considered under the statute as being adjacent were baseball fields.

MR. TAIT: No -- no pools -- no municipal pools?

MR. CRETELLA: Uh --

MR. TAIT: A swimming pool?

MR. CRETELLA: Again, the facility -- no. To the best of my knowledge, no.

MR. TAIT: If they had been, you would have included it?

MR. CRETELLA: Yes. Yes.

CHAIRMAN KATZ: Okay -- well, we invite the City of Milford to pursue this if they wish. Okay --

MR. CRETELLA: And as an example, the JCC is a privately owned facility, it's not a public playground, but it is a licensed youth camp and is identified as a licensed youth camp under the buffer zone statutory facilities. But if it did not have a licensed youth camp, it would not be included.

CHAIRMAN KATZ: But is the fact that

membership is open to the public not a factor then is what you're saying?

MR. TAIT: Now we're arguing the definition --

CHAIRMAN KATZ: Well -- yes, you're right.

MR. CRETELLA: Again, I -- I think from our perspective guidelines from the Council would be extremely helpful --

CHAIRMAN KATZ: Yes --

MR. CRETELLA: -- for us to determine how to apply the statute language.

CHAIRMAN KATZ: Yes. Well, I guess -- just -- I encourage you to look at the spirit of what they were trying to cover as opposed to the --

MR. CRETELLA: I believe we did try to --

CHAIRMAN KATZ: Okay --

MR. CRETELLA: -- look at the spirit of what was there in our identifying what we believe to be the statutory facilities adjacent to the right-of-way.

CHAIRMAN KATZ: Okay. And again, we invite everyone to brief on this matter of what should be the statutory facilities.

Okay, does that conclude Eisenhower Park? And I think we're ready to go back to Mr. Boucher. Here?

Absent? Is there anyone representing Durham/Wallingford?

A VOICE: No questions.

CHAIRMAN KATZ: No questions, thank you. Next Westport. Is Mr. Cederbaum here?

A VOICE: No.

CHAIRMAN KATZ: The City of Meriden, Attorney Moore? Assistant Attorney General Michael Wertheimer.

MR. FITZGERALD: Madam Chairman --

CHAIRMAN KATZ: Yes?

MR. FITZGERALD: -- while Mr. Wertheimer is coming up, I'd like to let the Council know that we now have the copies of the -- of this morning's presentation slides and --

CHAIRMAN KATZ: Great. And you'll pass those out? And do you want to verify those right now while he's getting settle in?

MR. FITZGERALD: Could we do that? Could we give it a number, Mr. Cunliffe?

CHAIRMAN KATZ: Mr. Cunliffe.

A VOICE: 155 --

MR. CUNLIFFE: Subject to check --

CHAIRMAN KATZ: Okay, while he's getting settled in, why don't we have your witness verify that

exhibit.

A VOICE: 136 --

MR. FITZGERALD: Miss Bartosewicz, the document that's been marked as Exhibit 136 --

MR. CUNLIFFE: 136.

MR. FITZGERALD: 136 purports to be a copy of the slides that you showed in this morning's magnetic field transmission design options presentation. And is it a true copy of the documents that you presented this morning and testified about already?

MS. BARTOSEWICZ: Yes, it is.

MR. FITZGERALD: I offer it as a full exhibit.

CHAIRMAN KATZ: Is there any objection to making it a full exhibit, No. 136, a copy of this morning's presentation? Hearing none, it will be a full exhibit.

(Whereupon, Applicants' Exhibit No. 136 was received into evidence as a full exhibit.)

CHAIRMAN KATZ: Okay. Mr. Wertheimer.

MR. MICHAEL WERTHEIMER: Michael Wertheimer for the Office of the Attorney General. Good afternoon.

I'd like to start with the presentation, a copy of which was just handed out, and follow up on some

questions from Attorney Kohler on this. Dr. Bailey, as I understand it you went over a couple of different techniques to mitigate EMF in this presentation, is that right?

DR. BAILEY: These refer to the strategies that are also described in my testimony and have been discussed elsewhere.

MR. WERTHEIMER: Okay. And just to review, you can alternate pole heights, you can do split-phasing, and there's optimized split-phasing and then there's also where you can put the 115 and the 345 on the same pole --

DR. BAILEY: Yes --

MR. WERTHEIMER: -- those are kind of the --

DR. BAILEY: Or relocation.

MR. WERTHEIMER: Or relocation, sure. Let's just talk -- set aside relocation for a minute.

CHAIRMAN KATZ: Just before you proceed, we're just going to have a clarifying question if we could.

MR. EMERICK: With respect to split-phasing, we keep mentioning it, but then sometimes we talk about optimized split-phasing. And I just want to make sure that when we're -- and based on the presentation this

morning, they're clearly two different strategies, at least in my mind. But we see on these strategies split-phasing isn't mentioned, but optimized split-phasing is. So, I just want to be clear that we know what we're talking about when we talk --

CHAIRMAN KATZ: Is there a difference?

MR. EMERICK: Or let me ask it another way. If you decided that you wanted to use split-phasing, is there some reason why you just automatically wouldn't go to optimized split-phasing --

DR. BAILEY: If you --

MR. EMERICK: -- so that --

DR. BAILEY: -- if you did the split-phasing design, you would then go further and make sure that it was optimized to produce the lowest magnetic field for the conditions you were interested in modeling.

MR. EMERICK: So in the record where we talked about split-phasing, we can always interpret that to mean that we would go to optimized split-phasing?

DR. BAILEY: I believe so. That's -- that would be -- that would be a fair assumption. You know in the video we showed that just splitting the phases --

MR. EMERICK: Right --

DR. BAILEY: -- without any optimization

resulted in some lowering in the field, but you could go further by optimizing the phasing.

MR. EMERICK: But once you started down the road of wanting to mitigate it --

DR. BAILEY: Right --

MR. EMERICK: -- assumingly you'd go to optimization?

DR. BAILEY: Right.

MR. EMERICK: Okay, good. Thank you.

CHAIRMAN KATZ: Okay.

MR. TAIT: But in your testimony you have some -- but in your testimony and others when they talk about split-phasing, they aren't always referring to optimizing split-phasing. The danger is I don't want to have Brian say that there is one definition that fits all. I don't think there is. I think the testimony has sometimes been just talking about split-phasing --

DR. JOHNSON: Well --

MR. TAIT: -- or sometimes -- how do you say it -- optimizing a reverse split-phasing. The technique to -- that you were talking about this morning was optimizing it, which is CBA rather than -- so, I think we ought to stick with optimizing and not go back just to split-phasing.

DR. JOHNSON: I think if everyone is careful to make sure they say optimized split-phase from here on out, that's always the safest --

MR. TAIT: Yes.

CHAIRMAN KATZ: Yes.

DR. JOHNSON: I would comment that for the purposes of the video this morning, we used the term split-phase meaning just splitting the currents and then optimize split-phase so that once you split the currents, then you look at changing the phasing to get your absolute best results from it. So just in terms of clarification this morning, yes, we used split-phase and optimized split-phase. I think -- and the rest of the panel can disagree or agree with me, but up until the point of this morning, anytime the phrase split-phrase had been used, up until the video this morning, I think it was always in the case of doing that optimized situation.

MR. EMERICK: Okay.

CHAIRMAN KATZ: Mr. O'Neill --

DR. BAILEY: The explanation was put in there in the video so you could understand the process, you know, to distinguish splitting the phases physically from the phasing just for explanatory purposes.

CHAIRMAN KATZ: Thank you. Mr. O'Neill.

MR. O'NEILL: You did a fine job with your presentation and I appreciate the model that you did. One of the questions which hasn't yet been asked is the doubling of the costs in some of these segments. Is there additional equipment that's needed? And where else has this equipment been used on a project of this size, if anywhere? Well, I'm assuming that --

MS. BARTOSEWICZ: Essentially, the increased costs relates to the additional conductors required, the size of the pole, the --

MR. ZAKLUKIEWICZ: The size of the foundation --

MS. BARTOSEWICZ: -- the size of the foundation. As Mr. Zak testified, the bigger the pole, the bigger the foundation. So these costs are, essentially, the numbers that you see in this presentation, unless you're putting a 115 underground, are based on that. If you see an alternative that has the 115-kV going underground, then you should see a much larger cost differential than just the cost of the conductors and the pole and the foundation.

MR. O'NEILL: Are these fairly hard numbers or are these theoretical?

MS. BARTOSEWICZ: They're high level based

on what was filed in the application already.

CHAIRMAN KATZ: Thank you.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Mr. Cunliffe.

MR. CUNLIFFE: Just to follow-up on the terminology, there's a number of tables and some of the terminology is used, optimized, and then there's a lot of other locations where the term split-phase is. What is the -- what are the results of your calculations based on? Are they all split-phase, optimized, or is there a mix?

DR. BAILEY: As Dr. Johnson mentioned, everywhere up until the video where you saw the term split-phase, we had in mind optimized split-phase.

MR. CUNLIFFE: And all the data is calculated with split-phase in mind?

DR. BAILEY: With optimized --

MR. CUNLIFFE: Optimized --

DR. BAILEY: -- split-phase, yes.

MR. CUNLIFFE: Okay. Thank you.

CHAIRMAN KATZ: Okay. Back to your, Mr. Wertheimer.

MR. WERTHEIMER: Thank you. Mr. Zaklukiewicz, you also testified that in order to go from conventional phasing to split-phasing would take about one

to two structures on each end to make that transition, is that right?

MR. ZAKLUKIEWICZ: Yes, I did.

MR. WERTHEIMER: And you also testified to Attorney Kohler that going from 110-foot split-phasing to 130-foot split-phasing should be no problem, right?

MR. ZAKLUKIEWICZ: Yes, I did.

MR. WERTHEIMER: Okay. Can you describe for me or tell me whether there are any limitations, structural, technological limitations on going from one of these mitigation techniques to another in the same segment?

MR. FITZGERALD: Excuse me, what ----

MR. WERTHEIMER: By going from --

MR. FITZGERALD: Which of the two that you're talking about?

MR. WERTHEIMER: Any of them. If split-phasing works well in one place but then putting the 115 and 345 on another pole works well further down the road, is there some technological reason that you could or could not do -- that you could not do that?

MR. ZAKLUKIEWICZ: I think -- I think I testified the only place where that may not be possible is where you've got severe angles --

MR. WERTHEIMER: Right --

MR. ZAKLUKIEWICZ: -- there may be limitations on going from a split-phase say to two separate vertical structures. Those would be the only limitations. But if you were in a straight right-of-way, you would probably have to take a couple of different structures, and it may be that you've got to go from a split-phase to a horizontal and back to a vertical to get there, but those would be in this -- in this two structures that I think you need in most cases to go from one to the other, Mr. Wertheimer.

MR. WERTHEIMER: Okay. So other than a distance of transition of a couple of structures, the Siting Council when considering these, can stack these up one next to another to consider these options how ever they want?

MR. ZAKLUKIEWICZ: That -- that would be a fair statement.

MR. WERTHEIMER: Okay. Turning to this presentation that was just handed out, for each cross-section you give a couple of different options. For example, for Cross-Section there's Option 2, Option 3, Option 6, and in Cross-Section 3 there's Option 1 and Option 2. Those options are completely independent from

one another, is that right? Option 1 is not Option 1 for each cross-section?

MS. BARTOSEWICZ: That's correct --

MR. WERTHEIMER: Okay --

MS. BARTOSEWICZ: -- that's why the little drawings are there, to help understand how they're different.

MR. WERTHEIMER: And when you went up to Option 6, only through your list -- we don't know what the other options are, but you've ruled them out?

MS. BARTOSEWICZ: No, you actually do know what the other options are --

MR. WERTHEIMER: Okay --

MS. BARTOSEWICZ: -- we've previously filed a document that listed all of them. And what we ended up doing for this presentation and this filing on the measurement calculation was we did ask the Towns which two options they would like to see --

MR. WERTHEIMER: Okay --

MS. BARTOSEWICZ: -- and there were a couple of towns that provided us that information.

MR. WERTHEIMER: -- I recall.

MR. CRETELLA: That -- that document is Exhibit 96.

MR. WERTHEIMER: Okay. Dr. Bailey, I'd like to follow up with one question on your test -- on your prefiled testimony, page 7. Getting back to the same statement, which you've been asked about before, about where you say there may be other structures, even parts of houses that have been constructed within the right-of-way, do you know whether the houses that you speak of in this prefiled testimony would meet the residential area definition that has been applied by the Applicants in this case?

DR. BAILEY: No. I was just referring to my own observations of having seen, you know, outbuildings and other structures on the aerial photographs within the right-of-way.

MR. WERTHEIMER: So is the answer no or that you don't know?

DR. BAILEY: I do not know specifically with respect to the residential areas.

CHAIRMAN KATZ: I'm predicting by the end of this docket you will truly regret that paragraph.

MR. WERTHEIMER: If, hypothetically, the answer is no, that the houses that may be in the right-of-way don't meet the company's criteria of a residential area, then those houses would not be listed in your

Exhibit 2 with your testimony, is that a fair conclusion?

DR. BAILEY: Yes. Exhibit 2 only provided calculations for those facilities identified by the companies as statutory facilities.

MR. WERTHEIMER: Okay.

DR. BAILEY: But as we pointed out elsewhere that any residence that's identified on the aerial photographs, one can look up the approximate field value based upon the tables we've provided.

MR. WERTHEIMER: Can you refer to your exhibit 2. And forgive me if this is in one of the footnotes, but on the right-hand side of the page, there are dashes instead of numerical figures --

DR. BAILEY: Yes.

MR. WERTHEIMER: -- does that indicate -- that indicates that you don't know or that the reading is zero?

DR. BAILEY: It indicates that -- take for example the R-01 facility, reading across there are values for low field option A, low field option B. There was no third low field option C identified for that section of the route, Cross-Section 3. And similarly whenever you see a dash is that up to three options could -- you know, may have been identified, but the ones in which actual

designs were put forth, either selected by the towns or put forth by the company, were -- everywhere there were numbers provides. Where there are dashes, no additional options were identified.

MR. WERTHEIMER: And so that was not your determination, that was based on the preference of the housing area, whatever the facility is?

DR. BAILEY: It was based upon the preferences of the town and/or determinations by the company.

MR. WERTHEIMER: What would go under the company's determination?

MS. BARTOSEWICZ: The company -- what was the exhibit number --

MR. CRETELLA: It's Exhibit 96.

MS. BARTOSEWICZ: On Exhibit 96 what the companies endeavored to do was to think out of the box, to try to come up with configurations that might mitigate or lower magnetic fields, and we brainstormed essentially on a variety of structures. So it depends on what's there today, it depends on what the new proposed 345 structure would look like. It depends on the -- what the right-of-way was configured to be, how wide it was. Looking at those variables that we had to play with, we tried to come

up with configurations that made sense. So in some cases like in Cross-Section 1, you had four different configurations, where in others you only had one. So it really was a brainstorming session to see what we could possibly do on that right-of-way.

CHAIRMAN KATZ: Just to ask a follow-up question on that. If you took Volume 9, the overhead maps -- do you know what I mean in the -- if you took that and you went through each of these cross-sections and picked the option that had the lowest EMFs and took that out -- extrapolated that out -- I'm not explaining this well -- extrapolated that out to 3 milligausses, which in some cases will be going beyond the right-of-way, right?

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: Is that something that's mappable, where a person can look at that 3 milligauss line and make their own decision on whether that structure was a statutory structure versus not a statutory structure?

MS. BARTOSEWICZ: Uh --

MR. CRETELLA: In theory that might work. One of the difficulties is that in some of the EMF -- lowering EMF design options, it's lower on one side of the right-of-way but a little higher on the other --

CHAIRMAN KATZ: Right, so -- I mean --

MR. CRETELLA: -- so when you say choose the lowest --

CHAIRMAN KATZ: The lowest for each side --

MS. BARTOSEWICZ: You can't --

MR. CRETELLA: You can only choose one. You can't --

CHAIRMAN KATZ: Oh, I see what you're saying, yes --

MR. CRETELLA: You can only choose one option --

CHAIRMAN KATZ: Yes -- no, I understand what you mean, yes.

MR. CRETELLA: Yeah.

MS. BARTOSEWICZ: And my other question I guess would be you said -- are you defining statutory facility at some level?

CHAIRMAN KATZ: No. What I'm saying is if we -- if we want to look at what structures are there and make our own decision on whether we think it's a statutory -- for example, there might be a group of three houses that you didn't consider a statutory facility, we might want to think otherwise, what you could do is take the milligausses that are the lowest option for the side that

has the most structures -- do you see what I'm saying --

MS. BARTOSEWICZ: So you want us to figure out throughout the entire length of the right-of-way which structure provides the --

CHAIRMAN KATZ: Well in most cases most of the structures will be either on one side or the other, right, of the line?

MS. BARTOSEWICZ: I guess I'm --

MR. CRETELLA: By most structures, you mean most houses --

CHAIRMAN KATZ: Yes --

MR. CRETELLA: -- residential areas?

CHAIRMAN KATZ: Right.

MR. CRETELLA: In a lot of places the facilities border on both sides --

CHAIRMAN KATZ: Okay --

MR. CRETELLA: -- of the right-of-way.

CHAIRMAN KATZ: So it might not be doable?

MR. CRETELLA: It would be -- it would be challenging to try to make that determination as to which option you would choose on that basis.

COURT REPORTER: One moment please. (Pause). Thank you.

MR. FITZGERALD: But --

CHAIRMAN KATZ: It seems like Volume 9 is a resource that we can perhaps use more in making these types of decisions because it is a good overhead view of the different houses and schools and things near the line. Yes?

MR. FITZGERALD: I would point out that Exhibit 96 --

CHAIRMAN KATZ: Yes --

MR. FITZGERALD: -- does show you calculated values in 15-foot increments --

CHAIRMAN KATZ: Yes --

MR. FITZGERALD: -- out from the edge of the right-of-way for the different configurations. So that if you had the overhead map and scale --

CHAIRMAN KATZ: Yeah, I think I might try to do my own --

MS. BARTOSEWICZ: Well --

MR. FITZGERALD: -- and you were interested in a particular location, you can get some information that way.

CHAIRMAN KATZ: I think what I'm going to do is I'm going to take Exhibit 96 and I'm going to take Volume 9 --

MR. FITZGERALD: I'm sorry, it's Bailey

Exhibit 1 --

CHAIRMAN KATZ: Bailey 1?

MS. BARTOSEWICZ: Yeah --

CHAIRMAN KATZ: What is that in real hearing program numbers?

MR. FITZGERALD: That is --

MS. RANDELL: 124.

CHAIRMAN KATZ: 124. I might pick a town, try it myself, and then if I think it's doable, I'll come back and talk to you. Okay, back to you.

MR. WERTHEIMER: Thanks. Dr. Bailey, a final minor question. On page 2 of Exhibit 2 to your testimony, the second line of DC-81 --

DR. BAILEY: Um-hmm.

MR. WERTHEIMER: -- the omission of dashes on the right-hand side has no particular significance or does it?

DR. BAILEY: Let me double check -- (pause) -- that's correct. Only two options were identified on that cross-section as shown in Exhibit 1 --

MR. WERTHEIMER: Okay --

DR. BAILEY: -- so those -- there should be dashes there.

MR. WERTHEIMER: Thank you. Dr. Johnson,

you testified this afternoon that -- I think you said if a line has current, it has magnetic field, do you recall that statement?

DR. JOHNSON: Could you repeat that?

MR. WERTHEIMER: You said if a line has current, it has a magnetic field --

DR. JOHNSON: Oh --

MR. WERTHEIMER: -- I think you were talking about -- do you recall that?

DR. JOHNSON: Yes. Basically, anything with a current running through it will produce a magnetic field.

MR. WERTHEIMER: You were talking about the difference between XLPE and HPFF technology, is that right?

DR. JOHNSON: I think that was in reference to other types of newer conductors, different conductors that may be low field conductors.

MR. WERTHEIMER: You're talking about alternating current technology, right?

DR. JOHNSON: Alternating current, direct current, if there is current, there is a magnetic field.

MR. WERTHEIMER: Isn't there a difference in the magnetic fields generated by DC lines versus AC

lines?

DR. JOHNSON: A DC line since it has direct current will produce what's called like a static or constant magnetic field. It doesn't oscillate 60 times a second --

MR. WERTHEIMER: Alright --

DR. JOHNSON: -- like the magnetic -- like an AC magnetic field from AC current. Basically, the oscillating magnetic field is a reflection of the oscillating current. If the current is steady as in DC, the magnetic field is steady.

CHAIRMAN KATZ: And just to refresh us since Dr. Bailey won't be here Thursday, what's the EMF level from a DC cable?

DR. JOHNSON: From a DC cable?

CHAIRMAN KATZ: Yeah, underground cable.

DR. JOHNSON: Again, it depends on the magnitude of the currents and the depth of the cable.

CHAIRMAN KATZ: Well, can I have --

DR. BAILEY: And the design of the cable system.

CHAIRMAN KATZ: Okay.

MR. WERTHEIMER: Can you give an order of magnitude difference? Are you talking about the same --

the same loading, the same usage characteristics of a DC line versus an AC line? The DC line is lower, isn't that correct?

DR. BAILEY: Yeah, in magnitudes they would be roughly the same -- if I recall for the Cross Sound Cable we had at one location a maximum field at the surface of the seabed, which was -- I can't remember -- four or six feet -- .16 gauss or 160 milligauss -- but perhaps Dr. Johnson and I can pull together some typical values overnight and report back tomorrow morning on some more extensive data on this.

CHAIRMAN KATZ: We'd appreciate that.

MR. WERTHEIMER: That's all, thank you.

CHAIRMAN KATZ: Thank you, Mr. Wertheimer. Next is the City of Bridgeport, Attorney Howlett. Not here. The Communities for Responsible Energy, Trish Bradley? No questions she said. OCC, Mr. Johnson? Not here. Woodlands Coalition? Not cross-examining. ISO New England, Mr. Macleod?

MR. MACLEOD: No questions, Madam Chairman.

CHAIRMAN KATZ: DOT --

COURT REPORTER: Mr. Macleod said?

CHAIRMAN KATZ: Mr. Macleod said -- I'm sorry, Mr. Macleod said no questions. DOT, Attorneys

Walsh and Meskill?

A VOICE: No questions.

CHAIRMAN KATZ: DOT said no questions. The Town of Fairfield? Absent. The Town of Weston, I'm assuming no questions?

A VOICE: No further questions.

CHAIRMAN KATZ: No further questions they said. South Central Connecticut Water Authority?

MR. LORD: No questions.

CHAIRMAN KATZ: Attorney Lord said no questions. The Town of Cheshire, Attorney Burturla?

MR. RICHARD BURTURLA: No questions.

CHAIRMAN KATZ: He said no questions. The Town of North Haven? Absent. Mr. Rosenthal, Ezra Academy, B'Nai Jacob.

MR. ROSENTHAL: Yes.

CHAIRMAN KATZ: And then we will go to Mr. Cunliffe after that and Council questions. Is there anyone who I did not call upon who plans to cross-examine this panel --

MR. ROSENTHAL: Yes, yes --

CHAIRMAN KATZ: -- is there anyone who I did not call upon who plans to cross-examine this panel? Okay.

MR. ROSENTHAL: Good afternoon. My name is Kenneth Rosenthal and I'm here in place of my partner David Schaefer, who unfortunately had to be at another hearing today.

COURT REPORTER: Would you be good enough to spell your name for the record --

MR. ROSENTHAL: R-o-s-e-n-t-h-a-l. I'm not sure -- is it Dr. Johnson?

DR. JOHNSON: Yes.

MR. ROSENTHAL: Okay. Doctor, I think you referred -- and perhaps Dr. Bailey can chime in on this as well -- we've had some discussion that the panel was recently asked about in terms of optimized -- split-phasing and optimizing split phasing. As I understand it, what's going on here is you have current that's going to be flowing through two rather than one wire in such a way that the -- there's a cancellation if you will -- well, let me just get it right -- there's a -- an arrangement so that the flows cancel some of the effect of the EMF out, is that correct?

DR. JOHNSON: That's -- that's correct. When the -- when you have two different phases, each conductor, each phase, the current on it will produce a magnetic field. If you have adjacent to it or near to it

a conductor with a different phase, the magnetic field produced by it will be at a different phase than from the field from the first one. And now you're looking at combining the fields from each one of those conductors and they're at a different phase and so you get some cancellation.

MR. ROSENTHAL: Okay. So -- so the cancellation is going to depend on the equipment operating and the current operating in such a way that they're in sync or out of sync in such a way that there's a cancellation effect, is that correct?

DR. JOHNSON: Basically, they're out of sync with a different phase.

MR. ROSENTHAL: Okay. And if the current isn't out of sync, then that effect isn't going to occur, is it?

DR. JOHNSON: Well, you'll still combine the fields, but because of -- if the -- let's say if the phases are in sync, both of them say A phase, then the fields produced by those two conductors are going to be in phase and so they'll add together.

MR. ROSENTHAL: So in that -- in that situation rather than reducing the magnetic field and the EMF effect, they can increase the magnetic field?

DR. JOHNSON: They work together.

MR. ROSENTHAL: And I think you indicated in response to one of the questions that was asked by one of my colleagues earlier that -- that in some situations where you have -- where you have that situation there can be an increase rather than a decrease in the magnetic field effect. Is -- do you recall that testimony?

DR. JOHNSON: If the phases are similar --

MR. FITZGERALD: I'm going to object to the question, to the reference of that situation. At this point I don't know what situation we're talking about.

MR. ROSENTHAL: Do you understand, Dr. Johnson -- alright, let me rephrase it.

AUDIO TECHNICIAN: Mr. Rosenthal, would you just take that microphone --

MR. ROSENTHAL: Sorry, yes, I will --

AUDIO TECHNICIAN: Just point it to the -- so it's in the same direction you're talking.

MR. ROSENTHAL: In regards to like that situation, if -- if we're going back -- I'm not sure exactly what that is, we're talking about the situation where the two phases are the same, where you have two phase A's, such as in the model test, when both phase A's were at the top of the modeled tower, they were producing

magnetic fields that were in phase, and so the magnetic fields add or enhanced each other. If you now put phase C at the top of the tower, so you have phase A and phase C, there are going to be different phases out of phase and so the fields will to some extent act against each other or cancel, okay. And if you add to that a 115 line -- did your modeling include the 115-gigawatt line that is already there?

DR. JOHNSON: No, in the modeling we showed what would happen if you took a regular line, a three-phase, and split the phases either making them ABC, ABC on the tower, or optimize split-phase, ABC, CBA. So it was for one circuit.

MR. CRETELLA: For clarification, your -- for clarification, your reference was 115 volts or 115 --

A VOICE: Gigawatts --

A VOICE: Volts --

MR. CRETELLA: Volts --

A VOICE: Kilovolts --

MR. CRETELLA: Kilovolts --

A VOICE: Kilovolts --

MR. CRETELLA: Kilovolts --

MR. ROSENTHAL: If there's a 115-kilovolt line that's also in the same right-of-way, is that going

to have an effect on the cancellation or the split-phasing impact on magnetic fields?

DR. JOHNSON: Well, the fields from the split-phase will be the same for that split-phase line. In addition, you will have the added fields or the additional fields contributed by the 115-kV line, and you'll have to take those into account when you come up with the total magnetic field.

MR. ROSENTHAL: Does the direction of flow in either of the lines affect the impact on magnetic field?

DR. JOHNSON: If you're talking about a multi-line corridor, if you keep one line the same and you change the direction of flow on the other line or other circuit, it will change the magnetic field levels that you'd measure.

MR. ROSENTHAL: Will it increase them or decrease them?

DR. JOHNSON: It depends on how the lines are configured and set up.

MR. ROSENTHAL: Okay. Now, I think you indicated or it's been indicated that the figures that have been presented to the Siting Council are figures that assume that the multi-phasing that's going on on these

planned lines are optimized, is that correct?

DR. JOHNSON: I believe that's correct.

MR. ROSENTHAL: So does that, in effect, mean that they operate at the -- they operate flawlessly so to speak?

DR. JOHNSON: I'm not sure -- I mean --

MR. ROSENTHAL: Alright, let me rephrase it --

DR. JOHNSON: -- the equipment operates --

MR. ROSENTHAL: Flawlessly with respect to the multi-phasing, that is that they are exactly out of sync in the way that you described before?

DR. JOHNSON: The phasing of the various lines is fairly stable over time. I mean what's phase A on one line for that location will remain phase A.

MR. ROSENTHAL: And that's the way you modeled it, you modeled it to remain operating the way it's suppose to operate with the proper flow and the proper --

MS. RANDELL: Madam --

MR. ROSENTHAL: -- in relationship to the other line --

MR. FITZGERALD: Well --

MS. RANDELL: Madam --

MR. ROSENTHAL: -- isn't that correct?

MS. RANDELL: Madam Chairman, before the witness answers, Mr. Rosenthal has been speaking of models I think in a couple of ways during his examination. I haven't wanted to intrude, but in this question I gather he doesn't mean the model -- the physical model that was shown in the DVD this morning as opposed to the computer model, which I think is a Bonneville --

MR. ROSENTHAL: I'm referring to the computer model --

CHAIRMAN KATZ: Okay --

MR. ROSENTHAL: Okay.

CHAIRMAN KATZ: We'll make that differentiation between parking lot wood and computer model.

MR. ROSENTHAL: Yes.

MS. RANDELL: That would be good, thank you.

MR. FITZGERALD: Well, I object to the question in any event as incoherent, so perhaps --

MR. ROSENTHAL: The computer -- I'll ask it again -- the computer model that you utilized included a series of assumptions, the data that was fed in that were assumptions, correct?

DR. JOHNSON: For the input to the computer calculation model, we have the phase angle for the particular conductor, we have the line height, we have the conductor position, and we have the voltage on the line, as well as the current magnitude.

MR. ROSENTHAL: And the direction of the current?

DR. JOHNSON: That is incorporated in terms of the phasing and the current magnitude.

MR. ROSENTHAL: And in addition to the items you've described, you also assume that none of the lines are down, correct?

DR. JOHNSON: For the particular calculations that we did, it assumed all lines within the right-of-way functioning.

MR. ROSENTHAL: And you would agree with me that if you have six lines instead of three lines at any particular location, the likelihood of one of them going down is higher?

DR. JOHNSON: That gets into a reliability question --

MR. ROSENTHAL: Yeah, it does. And if a line is down, if one of the six lines is down, what does that do to the multi -- the impact on -- that we're

talking about in terms of optimizing EMF fields?

MR. FITZGERALD: I'm going to object to that question as having no foundation in the record. No one is talking about six lines. I mean perhaps he's -- perhaps Mr. Rosenthal --

MR. ROSENTHAL: Withdrawn --

MR. FITZGERALD: -- is talking about conductors --

MR. ROSENTHAL: What is -- whatever number of lines there are, if one of the lines that's on the tower that's a multi-phase operation is down, that negatively impacts the effect you're speaking about in terms of EMF, correct?

DR. JOHNSON: It would depend on a particular multi-line corridor and the current levels on the other lines.

MR. ROSENTHAL: Okay. Now in the video we saw it described -- it showed us the -- I'm not sure how Chairman Katz described it -- the wooden test that was done up in your laboratory -- where is it, in New York?

DR. JOHNSON: In Massachusetts.

MR. ROSENTHAL: Massachusetts. When you did that test, did you test -- did you perform a test to see what would happen if one of the lines we saw in that

video wasn't operating?

DR. JOHNSON: One of the test is where you only had one-half of the tower energized with ABC and then added the second set of conductors --

MR. ROSENTHAL: No, I understand, but after the phases were set on the second set where you added the second set of conductors, did you -- did you check to find out what would happen and what measurements you would get if one of those six lines was cut out?

MS. RANDELL: Madam Chairman, can I just request that we have a clarification here. It would appear to me that Mr. Rosenthal may be talking about the phases or the conductors. And my understanding and the witnesses can confirm, is that if one is down, the whole line is down --

CHAIRMAN KATZ: Is --

MS. RANDELL: -- and so I'm not sure --

MR. ROSENTHAL: Is that right --

MS. RANDELL: -- that the witness and Mr. Rosenthal are speaking the same language.

CHAIRMAN KATZ: Okay, can we ask that clarifying question, if one line is down, is the whole transmission line down?

DR. JOHNSON: Essentially, if one phase

goes out and --

MR. ZAKLUKIEWICZ: The line is out.

DR. JOHNSON: Yeah.

MR. ZAKLUKIEWICZ: The line will trip out if we lose one of the phases of the three-phase system.

CHAIRMAN KATZ: Okay. So --

MR. ZAKLUKIEWICZ: And the circuit will be dead until the repairs are made and all three phases are back in service.

CHAIRMAN KATZ: And when the line is down, there's no EMF --

MR. ROSENTHAL: And what is --

CHAIRMAN KATZ: -- correct?

MR. ZAKLUKIEWICZ: That is correct.

CHAIRMAN KATZ: Okay.

MR. ROSENTHAL: And what is the reliability data that we have from operating multi-phase 345-kilovolt systems as to how frequently that occurs?

MR. FITZGERALD: That being?

CHAIRMAN KATZ: The scenario where all the lines go down --

MR. ROSENTHAL: Yes --

CHAIRMAN KATZ: -- is that your question?

MR. ROSENTHAL: Yes -- well, one line -- if

one line goes down that causes the problem you described?

MR. ZAKLUKIEWICZ: I think we already filed in our testimony what the average number of trips or interruptions for a 345-kV overhead transmission line are. And if my memory serves me right to correction, I think we're looking at somewheres less than 1.5 trips per hundred miles per year --

CHAIRMAN KATZ: So, Mr. Zak --

MR. ZAKLUKIEWICZ: -- subject to check.

CHAIRMAN KATZ: Just to clarify this. When you do a 345 line in split-phase, are you more apt, less apt, or no difference in the amount of time that you have transmission line outages? Does it increase the possibility of having transmission line outages?

MR. ZAKLUKIEWICZ: Because you have more hardware up there, more insulators, you would --

CHAIRMAN KATZ: Yes --

MR. ZAKLUKIEWICZ: -- you would be suspect of having an insulator flashover to be more frequent if the entire line was split-phase.

CHAIRMAN KATZ: Okay. So can you give us a relative -- can you quantify that in any way? Is Southwest Connecticut going to have more outages if this line is split-phase?

MR. ZAKLUKIEWICZ: I would say there probably will be a slight increase, but not a dramatic increase.

CHAIRMAN KATZ: Okay. Mr. Emerick had a clarifying question and then we'll go back to you, Mr. Rosenthal.

MR. ROSENTHAL: Thank you.

MR. EMERICK: Dr. Johnson, in your describing the criteria that went into the model, I think one of the criteria was current magnitude?

DR. JOHNSON: Yeah, basically if we're talking like 500 amps, 1,000 amps, as well as its phase, whether it's phase A, phase B, phase C.

MR. EMERICK: So the current -- okay.

MR. ROSENTHAL: Now -- this question is directed to anyone, including Dr. Bailey -- you made reference to an actual measurement that was done in an actual facility in western New York -- is that where it was?

DR. BAILEY: Yes.

MR. ROSENTHAL: Okay. That's 115 kilovolts, is that right, that system?

DR. BAILEY: It's a 115-kilovolt line, yes.

MR. ROSENTHAL: And is that in an area

similar to Southwestern Connecticut in terms of having a lot of municipalities in it and being a high industrial area?

DR. JOHNSON: The area is -- where the split-phase line occurs is in a -- basically near the main street of a town.

MR. ROSENTHAL: Is it just in -- is it -- how big a system is this?

DR. JOHNSON: I'm not sure of the total length of the line. I'll have to double check as far as the exact distance, but there are several spans at least of this split-phase design.

MR. ROSENTHAL: Are we talking about a system that's hundreds of miles?

DR. JOHNSON: Well, you're asking about the system versus the length of the line.

MR. ROSENTHAL: Are we talking about lines that are hundreds of miles -- well, let me withdraw the question. Is it fair to say, and I think you may have indicated this previously, that there aren't a whole lot of multi-phase systems in the western world that have been operating for any length of time?

DR. JOHNSON: Are you talking split-phase?

MR. ROSENTHAL: Split-phase, I'm sorry.

DR. JOHNSON: Okay. There -- there are very few reported instances of split-phase lines as split-phase lines.

MR. ROSENTHAL: And so we don't really have very much in the way of real world data as to how these lines function in practice, is that fair to say?

MR. ZAKLUKIEWICZ: That's -- that's not a fair statement. The answer is the facilities -- the equipment that's used on split-phase is no different, absolutely no different than the transmission facilities that are installed across the world. The monopole or the H-frame, or whatever you're using to achieve a split-phase is no different than the 115-kV facilities throughout Connecticut, throughout the United States. The only difference is you have a structure, which is no different than a double-circuit transmission line, and at some point you take the three conductors, you split them to six, you bring them back to three or whatever. We have double-circuit lines all across this country, all across Connecticut. And to insinuate that because I now split the conductors, I've got a total different reliability of the system, absurd --

MR. ROSENTHAL: Well --

CHAIRMAN KATZ: Just --

MR. ZAKLUKIEWICZ: -- absurd.

MR. ROSENTHAL: I'm not trying to argue with you, Mr. Palugawitz (phonetic), but the fact is, if it is a fact, that we don't have multi-phase systems in the western world other than a small number as far as you know, is that correct?

MR. ZAKLUKIEWICZ: The reason --

MS. RANDELL: Madam Chairman, this --

MR. ZAKLUKIEWICZ: -- the reason you don't have them is due to costs --

MS. RANDELL: -- we've covered this --

(gavel)

CHAIRMAN KATZ: Let's just take a moment here, okay.

MS. RANDELL: We have covered this one by Mr. McDermott's count three times already. I'd suggest that we could move on.

MR. ROSENTHAL: Well --

CHAIRMAN KATZ: First --

MR. ROSENTHAL: -- I'm just trying to establish that what we're being asked to accept in terms of numbers and in terms of having faith that this system is going to accomplish something is based on a computer model that I want to get to just now and not -- there are

not a lot of systems out there that we can look to say, oh, this works fine or we can do measurements.

CHAIRMAN KATZ: Okay.

DR. BAILEY: Let --

CHAIRMAN KATZ: And I think --

MR. ROSENTHAL: And I'll move on --

CHAIRMAN KATZ: I think --

MR. ROSENTHAL: -- if that point has been established.

CHAIRMAN KATZ: I think if you'll move on -- -

MR. ROSENTHAL: Okay --

CHAIRMAN KATZ: -- and I'm going to ask the witnesses to just -- (pause) --

MR. TAIT: How about the undergrounding, Mr. Rosenthal?

MR. ROSENTHAL: Excuse me?

MR. TAIT: And how about undergrounding --

CHAIRMAN KATZ: Yeah --

MR. ROSENTHAL: Well, undergrounding --

CHAIRMAN KATZ: -- we won't get into our experience on --

MR. ROSENTHAL: I'm not --

MR. TAIT: (Indiscernible, overlap of

talking) -- no real world experience --

CHAIRMAN KATZ: Yeah, I don't think Mr. Rosenthal wants to go there.

A VOICE: No, I don't think he wants to go there.

CHAIRMAN KATZ: Okay. And I'm just going to ask the witnesses to please just, you know, answer the questions and we'll go on.

MR. ROSENTHAL: Now, it -- I'm sorry --

DR. JOHNSON: I was reminded that actually Circuit 1690, which I believe is in Cross-Section 2, it's a 115 line, is actually split -- essentially is split-phase. It's a circuit that's split into two, just running on separate structures side by side, 1690A and 1690B.

MR. ROSENTHAL: Is it multi-phased?

DR. JOHNSON: It's a split-phase line. One of the lines is ABC --

CHAIRMAN KATZ: Mr. --

DR. JOHNSON: -- the second line is ABC.

MR. ROSENTHAL: Well --

CHAIRMAN KATZ: Just a second. I think one of the problems, Mr. Rosenthal, is you're using this multi-phase term that the witness panel is not using --

MR. ROSENTHAL: Okay --

CHAIRMAN KATZ: -- and I'm going to ask that we all use the same terminology. So --

MR. ROSENTHAL: Does the split-phase line that you're referring to, does that operate in the manner that you indicated would be operated to minimize magnetic field?

DR. JOHNSON: I'd have to look at the exact phasing. It's an existing line, but I don't believe it's optimally phased.

MR. ROSENTHAL: Okay. How -- do we have any experience from whatever multi-phased systems that are out there as to how difficult it is to optimize the phasing?

MS. RANDELL: Madam Chairman, could I just ask the witness a clarifying question that might take multi-phase off the table --

MR. ROSENTHAL: I'm sorry --

CHAIRMAN KATZ: Okay --

MR. ROSENTHAL: -- did I use the wrong word again?

A VOICE: Yes --

MR. ROSENTHAL: Split-phase. I didn't mean to. Do we have any -- let me rephrase -- do we have any experience from that or any other systems as to how

difficult it is to achieve the optimization of phasing that you assumed in your computer model?

DR. JOHNSON: It would -- let's say for the case of the 1690 line, if it -- it presently is on two horizontal structures, and as you go across the right-of-way, I believe it's phased ABC, ABC, so it's not optimally phased. If you wanted to optimally phase it, then you would have a transposition at some point and simply bring the C phase over into the middle say of the right-of-way and transpose the A phase over to the outside of the right-of-way. And that's a procedure that is done and has been done on other lines and is fairly common, especially on long runs of line --

CHAIRMAN KATZ: Dr. Johnson, this line is in Connecticut, this one you're referring to?

MR. ZAKLUKIEWICZ: Yes --

DR. JOHNSON: Yeah, 1690. In fact, I think it's in cross-section --

MR. ZAKLUKIEWICZ: We have a number of them, Chairman Katz. It's -- where we had an old 4-R (phonetic) conductor, we bundled the circuits, as is the case of the circuit through Durham, it's a single circuit on two separate H-frame structures, I didn't consider that to be split-phasing because it was bundled circuits. We

have a number of bundled circuits running down the right-of-way from Frost Bridge down into the Devon area for instance. We bundled them primarily to reduce the burden down of the single circuit for a contingency. So when we bundled the two, the current splits and we're able to have higher transfers from point A to point B.

CHAIRMAN KATZ: Okay.

MR. ZAKLUKIEWICZ: And we have a number of these out there and they're primarily where we have the older 4-R copper conductor operating at 115,000 volts.

CHAIRMAN KATZ: Thank you.

MR. ROSENTHAL: In terms of the optimization of the phasing, is that subject to mechanical failure?

DR. JOHNSON: No. I mean --

CHAIRMAN KATZ: Once you hang the lines, is that it?

DR. JOHNSON: Essentially yes, unless you're making changes at the substations or at the terminals. And the conductor that I call phase A, phase B or the next conductor will be essentially 120 degrees out of phase with that, and phase C then will be another 120 degrees. So in say a 360-degree rotation you will have the three phases. And that relation, the 120 degrees

between the three phases is basically constant. And --

MR. ROSENTHAL: Okay, and that's controlled by a -- by a -- I'm sorry --

DR. JOHNSON: And I would just add that that's determined by where that wire is conducted at the transformer back at the substation. It's a fixed quantity --

MR. ROSENTHAL: That gets --

DR. JOHNSON: -- phase A is determined by its connection at the transformers at either end.

MR. ROSENTHAL: Determined by a mechanical device?

DR. JOHNSON: It's -- it's --

A VOICE: Physical --

DR. JOHNSON: -- physical connection.

MR. ROSENTHAL: Physical connection.

MR. O'NEILL: So Dr. Johnson and Dr. Bailey, this is a commonly accepted form of installation of conductors?

MR. ASHTON: Universally --

MR. O'NEILL: Universally accepted?

DR. JOHNSON: Designation of conductors of use --

A VOICE: Yes --

DR. JOHNSON: -- yes.

MR. O'NEILL: Nothing experimental about this technique?

DR. JOHNSON: No.

MR. O'NEILL: Thank you.

MR. ROSENTHAL: Now in terms of the model -- the -- well, withdrawn. At the Woodbridge location where B'Nai Jacob is, there's a 15 --

A VOICE: One-fifteen --

MR. ROSENTHAL: A 115 -- kilovolt?

CHAIRMAN KATZ: A 115-kilovolt?

MR. ROSENTHAL: A kilovolt line there presently that is able to -- the current is able to go in either direction. Are you aware of that?

DR. JOHNSON: Well, the current flow on the lines will be determined by the load flows of what --

MR. ROSENTHAL: And in fact there are times when it goes to the Milford Substation in one direction or the current comes in -- back from the Milford Substation. And my question is if that line remains there and the split-phase system is put in place, will the direction that the 115-kilovolt current line current is flowing at any given time impact the EMF effect of the split-phasing that you've referred to?

DR. JOHNSON: Both the magnitude and the direction of flow of the current on the lines in the corridor will have an effect on the magnetic field. So if you change the magnitude, you change the direction, there is the potential for the magnetic field to change.

MR. ROSENTHAL: Okay.

DR. BAILEY: Can I -- can I just add that the function of the split-phase line however is independent of whatever the functions are of any lines that might be parallel to that. So that the ability of the conductors on one side of the split-phase line to interact with the phases on the other side of the split-phase line occurs whether or not there is any other lines parallel to that circuit.

MR. ROSENTHAL: The total EMF present at that location will be the combination of what's on the 115-kilovolt -- coming from the 115-kilovolt line and the split-phase system that you're planning on putting in place, is that correct?

DR. BAILEY: Right. But the split-phase system considered by itself --

MR. ROSENTHAL: Okay --

DR. BAILEY: -- that functioning is independent of the other lines. And the degree to which

the split-phase line inhibits or interacts with the 115-kV lines will depend upon the current loads on the 115-kV lines.

MR. ROSENTHAL: Okay. And your calculations of EMF projections in that area didn't include anything with respect to the 115-kilovolt line, is that correct? The numbers that we've been given in these exhibits and that were shown on the power-point was strictly the split -- the EMF effects of the split-phase system?

DR. BAILEY: No --

CHAIRMAN KATZ: Wasn't it everything that's going to hang on the poles?

DR. JOHNSON: Yes.

MR. ROSENTHAL: Including the 115-kilovolts?

DR. JOHNSON: It -- if the 115 lines are overhead, aboveground --

MR. ROSENTHAL: Yes --

DR. JOHNSON: -- it is included in the calculations and any of the options. For the options where -- if there are options included where the 115 lines are removed or put underground, then for those calculations they are not included because they're out of

the picture, they're underground and away from the site.

MR. ROSENTHAL: Where they're over-ground, what assumptions did you make in terms of the direction of the flow on the 115-kilovolt lines?

DR. JOHNSON: That again is based on the 15-gigawatt overall system load flow and the 27.7 gigawatt case.

CHAIRMAN KATZ: If you went to Cross-Section 8 in the middle in the latest exhibit, Glen Lake Junction to Pease Road Junction, is this the segment that the Ezra Academy/B'Nai Jacob is included in?

MS. BARTOSEWICZ: No --

CHAIRMAN KATZ: Okay, which one --

MS. BARTOSEWICZ: -- oh, I'm sorry, the middle --

A VOICE: The south segment --

A VOICE: What one is --

A VOICE: This one that's the middle, that's south --

MS. BARTOSEWICZ: The middle is the Jewish Community Center.

CHAIRMAN KATZ: Okay.

MS. BARTOSEWICZ: The 8 --

DR. BAILEY: 8 South --

MS. BARTOSEWICZ: -- south would be Ezra Academy.

CHAIRMAN KATZ: Okay. So if you went to 8 South and you looked at Option 4 and Option 5 --

MR. ROSENTHAL: Is this on the 20 -- the 15 or the 27 --

DR. BAILEY: The 15-gigawatt.

MS. BARTOSEWICZ: We're looking at the presentation.

CHAIRMAN KATZ: We're looking at Exhibit 136 from this morning, Cross-Section 8 South, Pease Road Junction to East Devon Substation, 12 miles, Woodbridge, Orange and Milford. If you look at Option 4 and Option 5, is -- the 80-foot pole and the 110-foot pole is that where the 115 is?

MS. BARTOSEWICZ: That's correct.

CHAIRMAN KATZ: Okay. And the split-phase is on the 105-foot pole and the 135-foot pole?

MS. BARTOSEWICZ: That's correct.

CHAIRMAN KATZ: And when you look at -- which side of the right-of-way, northwest or southeast, are the Ezra Academy and B'Nai Jacob?

MS. BARTOSEWICZ: Ezra Academy would be on the east side, so it would be the southeast edge of the

right-of-way.

CHAIRMAN KATZ: Okay. So if you -- let me make sure I understand -- if you did split-phasing with Option 5 in a 15-gigawatt case, that the edge of the right-of-way by Ezra Academy would be 0.6 milligausses?

MS. BARTOSEWICZ: It would actually be 0.5. The 0.6 in the chart is just the generic -- you know, the standard cross-section --

CHAIRMAN KATZ: Right --

MS. BARTOSEWICZ: -- if you go to Exhibit 2 of Dr. Bailey's testimony --

CHAIRMAN KATZ: Right --

MS. BARTOSEWICZ: -- the Ezra Academy specific location is 0.5.

CHAIRMAN KATZ: Okay. So being specific again, instead of generic for Section 8 South --

MS. BARTOSEWICZ: Yes --

CHAIRMAN KATZ: -- if they preferred Option 4 --

MS. BARTOSEWICZ: Yes --

CHAIRMAN KATZ: -- what would be the specific reading at Ezra Academy edge of right-of-way?

MS. BARTOSEWICZ: It would be -- (pause) --

DR. BAILEY: Well --

MS. BARTOSEWICZ: It would be 0.9.

CHAIRMAN KATZ: 0.9 instead of 1.7, which is the average?

MS. BARTOSEWICZ: It would be -- correct.

CHAIRMAN KATZ: Okay, thank you. Thank you, Mr. Rosenthal.

MR. ROSENTHAL: Thank you. And Dr. Bailey, in Exhibit 1 to your testimony, I think we have some of those same -- or close to the same figures on the 15-gigawatt case for Section 8, the middle -- is it the middle segment or south segment -- (pause) --

MS. BARTOSEWICZ: I'm sorry, where -- which cross-section are you on?

MR. ROSENTHAL: I thought I was on the right one, but -- this would be cross-section -- this is the south segment, right -- Cross-Section 8, I'm sorry.

DR. BAILEY: Oh --

MS. BARTOSEWICZ: That would be middle or south?

MR. ROSENTHAL: South.

DR. BAILEY: Okay.

MR. ROSENTHAL: I'm looking at Option 4 and 5 on the 15-gigawatt case of the south section, it's toward the end of your Exhibit 1. And these figures, the

.6 and the 1.7, where do they appear or approximately where do they appear? (Pause) Oh, I see -- they're right on the southeast edge of the right-of-way, is that correct?

DR. BAILEY: That's correct.

MR. ROSENTHAL: Alright. And if we were -- just for comparison purposes because this moves into the other area I wanted to cover, if we were to look on your same exhibit for that segment of Cross-Section 8 to the 27-gigawatt case, we see that the -- looking at the same location, the southeast edge of the right-of-way near B'Nai Jacob, the .6, six-tenths milligauss figure goes to 6.0, doesn't it?

DR. BAILEY: Yes.

MR. ROSENTHAL: So that's a ten-fold increase in the projection of what the EMF would be if instead of assuming a 15-gigawatt case we assume a 27 -- or a 20 -- or a 27-gigawatt case, correct?

DR. BAILEY: Yes --

MR. ROSENTHAL: And --

DR. BAILEY: -- but you have to put that in context. If you look up above on Cross-Section 8 south segment for the existing lines at the southeast edge of the right-of-way under existing conditions under the 15-

gigawatt case, the value is 3.9 milligauss. And when you look at the 27-gigawatt case, for the existing lines as they are configured today, it's 15.8 milligauss --

MR. ROSENTHAL: Right, so it's bad today. And the fact that the 20 -- going from 15 -- or it may -- it may be higher than certainly the numbers we're talking about here and so that the fact that you go from a factor of .6 to 6.0, just by changing the assumptions in what the gigawatt case should be is diminished is what you're saying?

MS. RANDELL: Let me --

DR. BAILEY: What I'm pointing out is that --

MS. RANDELL: Dr. Bailey, hold on. I'd object to --

MR. ROSENTHAL: Alright, let me withdraw the --

MS. RANDELL: -- the characterizations included in Mr. Rosenthals' question. If he's just asking about numbers, I'd obviously have no problem or objection to that --

MR. ROSENTHAL: Alright, let me follow up. Do you remember before you were asked by one of the other lawyers a question as to what the impact on the numbers

that we saw upon the screen this morning with the 15-gigawatt case would be if instead of assuming a 15-gigawatt case we had a 27-gigawatt case, and you indicated it would depend or you can't -- I think you indicated that you couldn't testify with certainty about that. Wouldn't you agree with me that at least as far as the figures that are in Exhibit 1 are concerned in this particular instance with these particular numbers we're talking about, it looks like a ten-fold increase at least in the Option 5 case, in the Option 4 case it looks to be closer to a four and a half to a five-fold increase?

DR. BAILEY: The table speaks for itself. And it's clear that when you go from the 15-gigawatt case to the 27-gigawatt case that the fields increase at the edge of the right-of-way for both existing lines and all of the options.

MR. ROSENTHAL: That's self-evident, correct?

DR. BAILEY: Yes.

MR. ROSENTHAL: And in terms of selecting for purposes of the modeling that you did, the 15-gigawatt case and the 27-gigawatt case -- well, let me back up -- these -- these lines that are going to get put in are going to be there for a long time, you would agree with

me? Is that correct?

DR. BAILEY: Whatever the life span is assumed by the facilities.

MR. ROSENTHAL: And the 27-gigawatt -- the projection for peak loads on this system at the 27-gigawatt level is a projection that comes to pass within the next four or five years, correct?

MS. BARTOSEWICZ: It comes to pass in the future for maybe one hour of the year.

MR. ROSENTHAL: Well, I'll get to that in just a minute, but the 27-gigawatt case that you used was based on the projections of what would be the peak load on this system within the next four or five years, correct?

DR. BAILEY: Out in the future and as was just said for one hour or so a year.

MR. ROSENTHAL: In 2007 or thereabouts?

DR. BAILEY: Thereabouts or it could be later.

MR. ROSENTHAL: Alright, which is when -- 2007 is when the line -- when this system will come on-line, correct?

DR. BAILEY: That's the projection.

MR. ROSENTHAL: And if -- if we -- if that -- if the assumption that goes into your computer model to

determine what the EMF levels are going to be at any given location is changed from something instead of 27 gigawatts to something higher, then that likewise is going to increase the exposure to -- the EMF exposure that somebody at any of these given locations would be subjected to? That again is self-evident, correct?

DR. BAILEY: I think the company would have to answer in terms of their estimate of how likely it was that the average load could jump from 15 gigawatts to 27 gigawatts for the average loading condition --

MR. ROSENTHAL: Well --

DR. BAILEY: -- not the peak --

MR. ROSENTHAL: -- I'm not talking about average load, I'm talking about peak load.

DR. BAILEY: I just --

MR. TAIT: Are we getting anywhere with this line of questioning, Mr. Rosenthal?

MR. ROSENTHAL: I hope so.

MR. ZAKLUKIEWICZ: I think --

MR. TAIT: I don't think so. I think what you're doing is --

MR. ZAKLUKIEWICZ: Maybe I can help clarify and --

CHAIRMAN KATZ: Well --

MR. TAIT: Please help -- these figures are obvious to us as well as to you.

MR. ROSENTHAL: Okay. Well, what --

CHAIRMAN KATZ: Okay -- I -- just to hopefully clarify, we did get an exhibit that we asked for previously and maybe the Applicant can point us back to it. We did ask for an exhibit on the frequency in the future of the 27-gigawatt case. Can you point us back to that exhibit so that we as a Council can refresh our memory on the frequency of that case?

A VOICE: No. 87.

CHAIRMAN KATZ: Thank you.

MR. ZAKLUKIEWICZ: Maybe I could help. The 15-gigawatt case we said was our best representation of what the generation would be on in Southwest Connecticut based on looking at previous years of each of the generators bidding into the system in what would be a typical dispatch at any given hour on the system. The 27-gigawatt case, if you recall, is the stressed system, that is Dispatch 2, minimum, minimum generation on in Southwest Connecticut, and it means maximum currents that would be flowing on the 345-kV system and 115 system meeting the load requirements in Southwest Connecticut. So what would be the typical flows on a 27.6 New England load with the

regular generation on at any given time, the flows on this corridor would be appreciably lower, but as we also testified in the planning mode stress the system, which means we had a major number of generators off-line in Southwest Connecticut and maximized the flows on the line. So, I think in previous responses that was not made clear. We're looking at what is the average condition at 15 and what is the stressed worst possible case at 27, and that's why the tables are dramatically different as opposed to looking at what would be the average dispatch and flows on the line at 15 and what would be the average at 27.

COURT REPORTER: One moment --

MR. ZAKLUKIEWICZ: We've been trying to -- (pause) --

COURT REPORTER: Thank you.

MR. ZAKLUKIEWICZ: We've been trying to be consistent and stress the system in all cases as opposed to picking and choosing where we stress the system. So, I just wanted to bring that clarification -- that would be a significant factor in why there's significantly higher EMF levels or magnetic field levels at the 27 cases than there are at the 15 case because (1) you use an average known basically price driven generation on, and the other one we say we don't really care what the price is, we assume a

number of large generating units in Southwest Connecticut are not available and you still have the maximum load of 27 gigawatts.

CHAIRMAN KATZ: Thank you. Back to you, Mr. Rosenthal.

MR. ROSENTHAL: Thank you. Mr. Palukowitz, maybe you can help me here. In the answer that --

MS. RANDELL: Mr. Rosenthal, just to clarify, maybe you can try this one again, it's Zaklukiewicz, or for those of us who are somewhat challenged, Mr. Zak works. (Laughter).

MR. ROSENTHAL: Oh, I see a P -- I'm sorry -- Mr. Zak -- Mr. Zaklukiewicz, I apologize --

MR. ZAKLUKIEWICZ: Not a problem.

MR. ROSENTHAL: It looked like a P from here. The June 24, 2004 response by Northeast Utilities I believe it is, to Town Question 88 -- I don't know whether I'm referring to this correctly, but it's -- it was a question that asked for clarification as to the number of hours during each year that a peak load is projected to be 90 percent of peak, 75 percent of peak, 50 percent, and 25 percent of peak. Do you have that there by any chance?

CHAIRMAN KATZ: Who was the responding witness, Mr. Rosenthal?

MR. ROSENTHAL: It was Alan Scarfone.

CHAIRMAN KATZ: Okay. Is there someone who can -- he's not here -- is there someone who can answer that?

MR. ROSENTHAL: Do you have it there?

A VOICE: The reference is Towns' 88.

MR. ROSENTHAL: Towns' 88.

MR. ZAKLUKIEWICZ: Okay, I have Towns' 88 in front of me.

MR. ROSENTHAL: Alright. This is -- there's a page that has a little tiny spread sheet in the middle of it --

MR. ZAKLUKIEWICZ: Yes, I have that in front of me.

MR. ROSENTHAL: Very good. It seems to indicate that 75 percent of peak or lower is experienced in 7,856 hours out of the year. And if one does simple calculation, that is multiply the number of days in the year by 24, one gets 8,784. So subtracting those two numbers, we have 928 hours apparently, according to the figures, that Northeast Utilities supplied -- 928 hours in the year when -- when the number is above 75 percent of peak. Do you see that?

MR. ZAKLUKIEWICZ: Yes, I'll take your word

--

MR. ROSENTHAL: Okay --

MR. ZAKLUKIEWICZ: -- that the math is correct.

MR. ROSENTHAL: And let me just understand. Does that mean that, assuming the numbers are correct, that for those number of hours when the load is above 75 percent of peak, that it's above 75 percent of 24.7 gigawatts?

MR. FITZGERALD: 24.7?

MR. ROSENTHAL: 27.7 gigawatts -- in other words, the peak load we're talking about is the peak load we've just been referring to, the 27-gigawatt case?

A VOICE: No, that's --

MR. ZAKLUKIEWICZ: This is the peak load of the system -- the peak load of the system to date I believe has been 25,400 approximate, give or take my chasing that or correcting that --

MR. ROSENTHAL: So 25,000 --

MR. ZAKLUKIEWICZ: -- 25,400 New England load has been the -- has been the peak.

CHAIRMAN KATZ: I think we're doing apples and oranges.

MR. ASHTON: Can I help out a little bit

here. I think --

CHAIRMAN KATZ: No, what I'm going to ask though is I'm going to ask Mr. Zak to -- I'm going to ask Mr. Zak -- Mr. Zak, we're talking -- and I think we're going to need a clarifying statement by you -- on one hand we're talking gigawatts and then on the other hand we're talking load on the system. And I think -- from up here it looks like we're talking apples and oranges. And I ask that one -- you or another witness can clarify?

MR. ZAKLUKIEWICZ: I think when we're talking peak load, we're talking what is the peak possibly of achieving that percentage of peak. And -- and the peak is one factor. The other factor is what is the generation on for that peak load. And the fact of the matter is I could be at max peak and basically have current flows on the 345 line, in particular the rights-of-way going down between Middletown and the Devon area through the Town of Woodbridge which are not significantly different than what they would be at the 15-gigawatt case. It's -- it is driven by two factors; No. 1 is the maximum load that is being requested and what is the generation that is on in Southwest Connecticut. And if the generation on is fairly close to what the load requirements are, there is not a whole lot of current flowing on those transmission lines -

-

MR. ROSENTHAL: But in terms of --

CHAIRMAN KATZ: But would it be fair to say -- let me -- just a second --

MR. ROSENTHAL: Sorry.

CHAIRMAN KATZ: Would it be fair to say there's a difference between the load you have to import on these transmission lines versus the load you're generating locally?

MR. ZAKLUKIEWICZ: That is correct.

MR. ROSENTHAL: But --

CHAIRMAN KATZ: And the more you import, then the higher the current. But if you generate it locally, you might have less current on that line because you're not having to import it into that region. Is that a fair statement?

MR. ZAKLUKIEWICZ: That's correct.

CHAIRMAN KATZ: Okay.

MR. ROSENTHAL: But in terms of what was -- but in terms of apples and oranges here, we're talking about the same thing. The 25,400 that you mentioned is 25.4 gigawatts, correct?

MR. ZAKLUKIEWICZ: That is correct.

MR. ROSENTHAL: Okay. So -- so -- I

understand that there's a second issue you get to, which is whether these gigawatts are going to come over this system as opposed to be generated locally. But just bear with me for a moment, using this exhibit, this Towns' 88, if we -- if we -- if we take 70 -- if we take 25 percent of the 25.4 gigawatt peak you've described as currently existing, that gives us something in the area of 20 gigawatts?

MR. ZAKLUKIEWICZ: I think the point we're trying to make with the table is the few amount of hours that you are above a certain percentage of time that you are actually experiencing the peak --

MR. ROSENTHAL: Okay --

MR. ZAKLUKIEWICZ: -- and I think I've testified to that a number of times that relatively approaching peak load conditions where you're at the 97 or 98 percentile of peak load conditions, we're talking in the tens of hours per year not at continuous operation. And this table reaffirms that, that --

MR. ROSENTHAL: Well, that's exactly what I want to get to, Mr. Zak, because I don't think it does. It shows that you're at -- you're at above 75 percent of peak, which 75 percent of 25.4 is in the range of 20 gigawatts, 928 hours out of the year, if you'll -- if

you'll accept the fact that 7,856 hours is 928 hours less than the number of hours in a year, and 928 hours in a 24-hour day is 40 days out of the year. But peak usage in terms of hours of usage is not going to be the full -- it's going to be during the day, isn't it?

MR. ZAKLUKIEWICZ: Yes, it --

MR. FITZGERALD: Well, I think -- I think there are many questions and statements in there --

MR. ROSENTHAL: Withdrawn --

MR. FITZGERALD: -- and if only the last question -- the last sentence is a question --

MR. ROSENTHAL: Withdrawn --

MR. FITZGERALD: Aren't you going to let him answer it --

MR. ROSENTHAL: Withdrawn. The -- the peak usage is typically going to be during the day, isn't that fair?

MR. ZAKLUKIEWICZ: Peak usage in New England is typically a summertime period during the daytime.

MR. ROSENTHAL: Okay. And so --

MR. ZAKLUKIEWICZ: And in winter, more at nighttime.

MR. ROSENTHAL: So if we have 928 hours of

usage above 75 percent of peak, we're talking about -- on an 8-hour basis, 120 days out of the year. That's not an insignificant number of days, is it, Mr. Paluk -- Mr. Zuk --

MR. ZAKLUKIEWICZ: Mr. Zak.

MR. ROSENTHAL: Mr. Zak.

MR. ZAKLUKIEWICZ: Again, it gets back to the point of I'm not certain -- I agree there's 900 and some odd hours or whatever the number is -- it's kind of irrelevant over the issue if you're trying to make it, is that the magnetic fields change dramatically during those 900 and some odd hours. If I look at the 10 percent mark of when is the load ever above 90 percent, I mean we're now looking at some very very small number.

MR. ROSENTHAL: Why don't I just get back to Mr. Bailey, if I could, and Mr. -- and Dr. Johnson. Dr. Bailey, the assumption that you made in your models were two -- you made only two assumptions. One was the -- in terms of system load, one was the 27-gigawatt case and one was the 15-gigawatt case. Am I correct so far? Those are the only two --

DR. BAILEY: For current flows.

MR. ROSENTHAL: Yes. Those are the only two numbers you ran?

DR. BAILEY: Yes.

MR. ROSENTHAL: Alright. What's the maximum -- once these lines are up, it's going to be up to the system and the economy and whatever else draws on them to decide how much is going to run over them. What's the maximum -- the maximum load these lines can carry over the course of the next 30, 40, or 50 years?

DR. BAILEY: Dr. Johnson reminded me that there was a data response in which load flows at 100 percent were provided. And Gary.

DR. JOHNSON: Yeah, basically --

MR. ROSENTHAL: What --

DR. JOHNSON: -- load flows at 80 percent and 100 percent of the maximum capability of the lines I believe are provided --

MR. ROSENTHAL: Okay --

DR. JOHNSON: -- as part of one of the --

MR. ROSENTHAL: What's -- we have 27 gigawatts. Where -- what range are we in when we talk about the maximum load on these lines? Is it -- is it 50 gigawatts? Is it higher than 50 -- how much can these lines carry?

MR. ZAKLUKIEWICZ: I think I testified to that earlier this morning. I said the bundled 1590

conductor could carry approximately 3,400 to 3,600 amperes. In theory that is the capability of the wires.

MR. ROSENTHAL: What's that in terms of gigawatts?

MR. ZAKLUKIEWICZ: In terms of gigawatts divide the 3400 by 166 and you'll get the gigawatts.

MR. ROSENTHAL: Okay.

MR. ZAKLUKIEWICZ: Approximately 2 -- 2,000 gigawatts --

MR. ROSENTHAL: Two thousand gigawatts?

MR. ZAKLUKIEWICZ: Approximately.

MR. ROSENTHAL: So -- okay.

MR. ZAKLUKIEWICZ: I mean -- yes?

MR. ROSENTHAL: And -- and assuming --

CHAIRMAN KATZ: Can you lean in --

A VOICE: Two thousand megawatts --

MR. ZAKLUKIEWICZ: I mean -- I mean --

A VOICE: Two thousand megawatts --

MR. ZAKLUKIEWICZ: I mean 2,000 -- megawatts.

MR. ROSENTHAL: How many gigawatts is that?

MR. ZAKLUKIEWICZ: Which would be two gigawatts. Okay?

MR. ROSENTHAL: Let me just ask Dr. Johnson

and Dr. Bailey, in terms of the assumption that you made as to the use of the 27-gigawatt case as being the highest of the numbers you ran to come up with these EMF exposure figures that you've presented, is there any reason that you didn't use a higher number projecting out?

DR. BAILEY: Essentially, the company had provided us with what they had considered based upon their modeling with the worst case estimate. And also you have to remember that the load flows that were just mentioned -- also if this line is connected to any portion that's underground, the underground portion of the line could not carry those kinds of current. So the proposed 345-kV circuit consisting of both overhead and underground sections would have to operate at maximum -- at some current flow well below that maximum conductor rating that Mr. Zak just described.

MR. ROSENTHAL: Well, at any --

MR. ZAKLUKIEWICZ: I think I can help you out --

MR. ROSENTHAL: Go ahead --

MR. ZAKLUKIEWICZ: -- on that a little bit. When we looked at the stressed system, we took out as much generation as you basically could, also taking into account what the import limits are into the State of

Connecticut. So that when you look at the case of 27 gigawatts and you look at minimum generation, you also have -- concurrent is a maximum -- basically a maximum import into the State of Connecticut and you cannot increase the flows on those lines any greater because of the limitations into the State of Connecticut and the rest of the generation that's on in the State. So if we're into a case where we've got flows greater -- hypothetically greater than what we've projected to be, which is the max flows on the line, the lights are going out in Southwest Connecticut to balance that flow because you just can't bring any more power into the State of Connecticut with the transmission lines that are in place at this time.

MR. ROSENTHAL: Alright, so that's a projection of a worst case scenario today, is that correct?

MR. ZAKLUKIEWICZ: That is correct.

MR. ROSENTHAL: But -- and it was a projection that was done of a worst case scenario out to 2007 or '08 I believe of -- instead of 24.7 gigawatts of 27.7 gigawatts. And I think we heard reference this morning to a GE study that used a 30-gigawatt number. But that's within a relatively short period of time, correct?

It's current -- it's what we -- what we know -- what we do today?

MR. ZAKLUKIEWICZ: I think I've already testified that if we're going to reach 27.7 and beyond, something else has to be done. And I've said that a number of times before the Siting Council --

MR. ROSENTHAL: Okay --

MR. ZAKLUKIEWICZ: -- because you just can't serve the load.

MR. ROSENTHAL: And Dr. Bailey and Dr. Johnson, you would agree with me that if what the future brings is a heavier load on some locations of this system, that's going to result in higher EMF readings than the readings you've projected? Isn't that true?

CHAIRMAN KATZ: Doesn't it --

DR. BAILEY: Not necessarily.

CHAIRMAN KATZ: Doesn't it matter where the load -- where the current --

DR. JOHNSON: Yes --

CHAIRMAN KATZ: -- is being served from?

DR. BAILEY: Right --

DR. JOHNSON: It depends on those lines and what the loading is going to be under those -- out in the future scenarios --

MR. ROSENTHAL: It depends on variables that are hard to predict right now, isn't that right?

DR. JOHNSON: It depends on variables that weren't modeled right now.

MR. ROSENTHAL: Yes. And even the variables that were modeled that required you to make assumptions about those variables, that may not be the case on a given -- in the future?

DR. JOHNSON: Do you want to clarify --

MR. ROSENTHAL: Well, you made an assumption --

DR. JOHNSON: -- or be a little more specific on that?

MR. ROSENTHAL: You made an assumption as to -- if you did, you made an assumption as to topography and as to climate and as to all the factors that go into the way the system will operate, did you not?

DR. JOHNSON: We looked at conductor heights and we also specifically at those locations looked at the conductor heights at those locations, the load flows, the line positioning.

MR. ROSENTHAL: Alright. And all of that impute into your computer model affects the output from the computer model, correct?

DR. JOHNSON: It will have some impact, yes.

MR. ROSENTHAL: But one thing we do know, Dr. Bailey, for sure is that distance results in a decrease of EMF no matter what, correct?

DR. BAILEY: That's -- that's I would say an overly broad generalization. There are some cases where the fields from a particular line design will reduce as you go away from the conductors close to the right-of-way for example and then increase as you go further away from the line. So if you're comparing right underneath the line to some distance far away, that's true, but there are cases where in fact as you move further away from the line, the fields may increase somewhat.

MR. ROSENTHAL: Well, your testimony indicated on page 2 that -- that reduction in the strength of magnetic field with distance from the conductors is self-evident. It's -- it's almost a given, is it not?

DR. BAILEY: Over large distances, yes.

MR. ROSENTHAL: And that's confirmed in Exhibit 1 to your testimony, that is that you have the right-of-way and as you move out from the right-of-way, the EMF readings go down, correct?

DR. BAILEY: Generally speaking, yes.

MR. ROSENTHAL: Yes. And -- and there was -- and if you were -- if you're 300 -- if -- and that's the buffer zone issue, correct, that is that you're -- the creation of the buffer zone is something that's going to give distance between the source of the magnetic field and the protected population? That's --

MR. FITZGERALD: Objection --

MR. ROSENTHAL: -- that's what it's doing, right?

MR. FITZGERALD: Objection, a compound question.

CHAIRMAN KATZ: Just rephrase it please.

MR. ROSENTHAL: Isn't that what a buffer zone -- that's what the buffer zone is accomplishing, it's creating a buffer between the source of the magnetic -- generation of the magnetic field and the population you're trying to protect because distance will give that protection in almost every case?

DR. BAILEY: Mr. Rosenthal, the whole purpose of this hearing is to discuss what that definition --

MR. ROSENTHAL: Exactly --

DR. BAILEY: -- of the buffer zone is --

MR. ROSENTHAL: Exactly. And distance is

something we know will give us that protection as opposed to these variables that are hard to project into the future, isn't that true?

DR. BAILEY: It's one of the considerations, certainly. It's not --

CHAIRMAN KATZ: Mr. Rosenthal --

DR. BAILEY: -- by any means an exclusive aspect by which to consider buffer zones.

CHAIRMAN KATZ: Mr. Rosenthal, we're getting ready to wrap-up for today. Are we at a good point in your cross-examination --

MR. ROSENTHAL: Yes --

CHAIRMAN KATZ: -- to resume tomorrow morning?

MR. ROSENTHAL: Yes.

CHAIRMAN KATZ: Okay, what I'd like to do is just spend the next five minutes procedurally. Tomorrow morning we will take up any procedural matters that pop up over night. And then Mr. Rosenthal will continue his cross-examination and then we'll follow up by cross-examination by Council staff and then Council members of this panel.

Do we need a prehearing conference, I think not, tomorrow morning? We might have one Thursday, but I

think we're all set for tomorrow. Then following cross-examination of this panel, we are going to get into preferred town routes for the towns who wish to participate, hopefully going north to south -- yes, Mr. Fitzgerald?

MR. FITZGERALD: There's other testimony submitted on buffer zones. I don't want to deny --

MR. ROSENTHAL: Dr --

MR. FITZGERALD: -- Dr. Bell --

CHAIRMAN KATZ: Oh, I'm sorry --

MR. ROSENTHAL: Dr. Bell and Dr. Rabinowitz were going to be here first thing tomorrow. I --

CHAIRMAN KATZ: Let's go back to the hearing program -- thank you --

CHAIRMAN KATZ: Who has a direct case on the subject of EMF reduction and buffer zones other than Mr. Rosenthal's client? Anyone else?

MR. FITZGERALD: I don't --

CHAIRMAN KATZ: Okay. We will do cross-examination by the Council, then we will go into the direct case of the Woodbridge organizations, and then we will go into preferred town routes.

Do we have any idea, Mr. Fitzgerald, how much cross-examination you have of the --

MR. FITZGERALD: The testimony is short, then the cross-examination will be short.

CHAIRMAN KATZ: Well, the testimony is prefiled.

MR. FITZGERALD: Well, yeah, but it's also short.

CHAIRMAN KATZ: Yes -- oh -- I thought you said if -- I thought you said if. Okay.

Are there any other procedural matters that we need to go over before we adjourn today? I'm taking silence as acquiescence. And we are adjourned until 10:00 o'clock tomorrow morning.

(Whereupon, the hearing adjourned at 5:00 p.m.)

HEARING RE: CL&P and UI
JULY 27, 2004

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CERTIFICATE

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