BEFORE

## THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of	)			
Duke Energy, Ohio Inc. for an	)	Case	NO.	17-0032-EL-AIR
Increase in Electric Distribution Rates	.)			
	)			
In the Matter of the Application of	)			
Duke Energy Ohio, Inc. for Tariff	)	Case	NO.	17-0033-EL-ATA
Approval.	)			
	)			
In the Matter of the Application of	)			
Duke Energy Ohio, Inc. for Approval to	)	Case	NO.	17-0034-EL-AAM
Change Accounting Methods.	)			
	)			
In the Matter of the Application of	)			
Duke Energy Ohio, Inc. for Authority to	)			
Establish Standard Service Offer	)			
Pursuant to Section 4928.143, Revised	)	Case	NO.	17-1263-EL-SSO
Code, in the Form of an Electric	)			
Security Plan, Accounting Modifications	)			
and Tariffs for Generation Service.	)			
	)			
In the Matter of the Application of	)			
Duke Energy Ohio, Inc. for Authority to	)	Case	NO.	17-1264-EL-ATA
Amend its Certified Supplier Tariff,	)			
P.U.C.O. No. 20.	)			
	)			
In the Matter of the Application of	)			
Duke Energy Ohio, Inc. for Authority to	)	Case	NO.	17-1265-EL-AAM
Defer Vegetation Management Costs.	)			
	)			

DEPOSITION OF DONALD L. SCHNEIDER, JR.

Taken by Ohio Consumers' Counsel Charlotte, North Carolina December 6, 2017

Reported by: Candace E. Thomas, CSR

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On December 6, 2017, commencing at 12:01 p.m., the 1 2 deposition of DONALD L. SCHNEIDER, JR., was taken 3 pursuant to Notice, in accordance with Ohio Administrative Code 4901-1-21(B), on behalf of the 4 Ohio Consumers' Counsel, at 400 South Tryon Street. 5 Charlotte, North Carolina. 6 \* \* \* 7 8 PROCEEDINGS 9 MR. HEALEY: This is the deposition of Donald 10 Schneider. This deposition is for Duke PUCO cases 11 17-32, et al., and 17-1263, et al. I am Christopher Healey, counsel for the Ohio 12 13 Consumers' Counsel, for Bruce Weston. We're at 10 West 14 Broad Street, Columbus, Ohio. With me is senior analyst, James Williams. We'll take Duke's appearance 15 16 next, and then people can go on the phone. 17 MS. WATTS: On behalf of Duke Energy, 18 Elizabeth Watts. 19 MR. SCHNEIDER: And on behalf of Duke Energy, Don Schneider. 20 21 MR. EVAN SHEARER: On behalf of Duke Energy, 22 Evan Shearer. 23 MR. HEALEY: That's everybody in the room. 24 So phone people, you're up. 25 MR. BEELER: On behalf of the Staff of the

Public Utilities Commission of Ohio, I'm Steve Beeler. 1 2 MS. MOONEY: This is Colleen Mooney with the 3 Ohio Partners for Affordable Energy. MR. BROWN: Duke Energy. This is Justin 4 5 Brown. 6 MS. LEPPLA: This is Miranda Leppla for OEC 7 and EDF. MR. MOORE: This is Kevin Moore with the Ohio 8 9 Consumers' Counsel. 10 MR. HEALEY: Anyone else? Okay. For those 11 of you on the phone, if anyone has any objections or 12 otherwise needs to interject anything during the 13 deposition, please identify yourself before you make 14 your comment so that the court reporter knows who is 15 speaking. 16 Did some people just join? This is the 17 Schneider deposition in the Duke cases. 18 MS. WHITFIELD: Yes. This is Angie whitfield 19 for Kroger. 20 MS. BOJKO: Hi. This is Kim Bojko for OMAEG. 21 MR. HEALEY: Hi, guys. We've already run 22 through the appearances. You are the last ones so far. 23 There was an instruction for the benefit of the court 24 reporter. If you have an objection or need to say 25 anything during the deposition, please state who you

are before you make your comment. I think I heard 1 2 another beep. MR. DRESSEL: This is Brian Dressel for 3 4 OMAEG. 5 MR. HEALEY: And someone else just walked in 6 the room from Duke. Can you just --7 MS. LOWE: Kathy Lowe. 8 MR. HEALEY: Great. Okay. With that, we are 9 going to get started. \* \* \* 10 11 Whereupon, DONALD L. SCHNEIDER, JR., having been 12 duly sworn, was examined and testified as follows: 13 EXAMINATION 14 BY MR. HEALEY: Q. Thank you for being here, Mr. Schneider. Is 15 16 that right? 17 A. Yes, that's correct. 18 Thank you. I'm just going to run through Q. 19 some preliminary stuff so we are all on the same page 20 in the way things are going today. If you don't hear 21 me or don't understand, feel free to ask me to repeat a 22 question. 23 First off, have you been deposed before? 24 A. Yes, I have. 25 Q. And do you have any questions for me at the

1 outset about the process?

A. No, I don't.

Q. Can you please state your name and business4 address?

A. Donald Lee Schneider, Jr. 400 South Tryon
Street, Charlotte, North Carolina.

Q. Great. Just a reminder, we need a verbal
response to all questions. Sometimes we may get a head
nod. If that's the case, I'll ask you to confirm
verbally what you are indicating.

And I would ask that if you want to take a break any time, that's fine, just let me know, but we'll finish the question that I've asked before we take the break, and then we'll proceed after that. Is that okay with you?

16 A. Yes, that's fine.

Q. Mr. Schneider, you understand that this
deposition is for two separate proceedings, Duke's base
distribution rate case which is number 17-32 and Duke's
electric security plan case which is 17-1263, correct?
A. Yes, correct.

Q. And you'll understand if I refer to the rate case that I mean Case Number 17-32?

24 A. Yes.

25 Q. And, likewise, if I refer to the ESP case or

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the SSO case, you'll understand that I'm talking about 1 2 PUCO Case Number 17-1263, et al.? 3 A. Yes. Q. You filed testimony in the rate case on 4 5 March 2, 2017, correct? 6 A. Yes, I did. 7 Do you have a copy of that testimony in front 0. 8 of you today? 9 Α. No, I do not. MR. HEALEY: I would like to mark OCC Exhibit 10 1 for this deposition. It will be Mr. Schneider's 11 12 testimony from the rate case, 17-32. I'm handing the 13 witness a copy, and I have a couple extras if anybody in the room needs one. 14 15 (Exhibit 1 marked for identification.) 16 BY MR. HEALEY: 17 Q. And you filed testimony in the ESP case on 18 June 1, 2017, correct? 19 A. Yes. 20 Q. And I assume you don't have a copy of that. Correct? 21 22 A. I do not. 23 MR. HEALEY: Okay. I'm going to mark Exhibit 24 2 which will be Mr. Schneider's testimony in the ESP 25 case, 17-1263, and he now has a copy.

(Exhibit 2 marked for identification.) 1 2 BY MR. HEALEY: Mr. Schneider, your pre-filed testimony in 3 Q. these two cases is substantially the same; is that 4 5 correct? 6 Α. Yes. 7 And did you draft this testimony yourself? Q. Yes, I did. 8 Α. Did anyone help you with it? 9 Q. 10 A. Yes. 11 Q. Who helped you with this testimony? 12 Evan Shearer and Justin Brown. Α. 13 Q. Anyone else? 14 Α. NO. 15 Q. And what were their roles in helping you with 16 this? 17 Just general support and pulling it all Α. 18 together. 19 Q. Did they do any of the actual drafting 20 language? I did most of that myself. 21 Α. NO. 22 You say you did most of it. Is there someone Ο. 23 else that did some of it? 24 Α. They did some. 25 Q. They did do some?

1 A. Yes, and I reviewed it all.

Q. Since we've established that your testimony in the two cases is substantially the same, to avoid having to ask every single question twice, I'm going to generally work off of your ESP testimony. So you can put your rate case testimony aside. We'll leave it in the exhibits, but just for simplicity, that's what I'm going to work off of if that's okay with you.

9 A. Sure.

10 Q. You're aware that OCC served discovery on 11 Duke in both of these cases, correct?

12 A. Correct.

Q. And you are identified as the respondent forcertain discovery requests in both cases?

15 A. Yes, I am.

Q. Similar to your testimony, there are some discovery questions that OCC asked in both cases. Again, I'm generally going to work off of the ESP version of the discovery requests, but we can assume that if asked the same question about the same discovery response in the rate case that the answer would be the same, correct?

23 A. Yes.

Q. There will be some instances where we asked it only in one or the other, so I may use some of the

1 rate case testimony at some point.

A. Okay.

In those discovery responses for which you 3 Q. are identified as the respondent, you in fact provided 4 5 those responses; is that correct? 6 A. Yes, I did. 7 And did anyone assist you with those 0. 8 discovery responses? 9 Again, Evan Shearer and Justin Brown. Α. Q. You're aware that OCC filed a notice of this 10 deposition in the two cases, correct? 11 12 A. Correct. 13 Q. Did you review that deposition notice? 14 A. Yes. Q. And you're aware that it asked you to bring 15 16 documents with you today? 17 Α. NO. 18 Did you in fact bring any documents with you 0. 19 today? 20 No, I did not. I will say I don't recall Α. 21 seeing anything formal about the deposition request. 22 So did your counsel inform you that you Q. 23 should appear today for this deposition? 24 Α. Yes. 25 But she or no one at Duke shared the actual Q.

1 notice with you?

A. I don't recall seeing the actual notice.
Q. That's fine. What is your current position
with Duke?

A. General manager in our grid solutions
organization with responsibilities for overall
management of our AMI program for the Duke Energy
enterprise.

9 Q. In your testimony, you identify your position 10 as general manager, advanced metering infrastructure 11 program management. Is that different?

A. Yeah, I think there was a recent titlechange, but it's basically the same position.

Q. Okay. And it says that you were in that role since 2008. Do you recall when in 2008 you assumed that role?

17 A. It was in the September timeframe.

18 Q. What are your responsibilities in that 19 position?

- 20 A. Back in September?
- Q. Currently.
- A. Currently?

23 Q. Yes.

A. As I just mentioned, I got responsibilities

25 for the overall management of our AMI program for the

Duke Energy enterprise. 1 And when you say "Duke Energy enterprise," 2 Q. 3 does that mean all jurisdictions? 4 Α. Yes. 5 Q. Do you have any direct reports? 6 Α. Yes. 7 Q. How many? 8 A. Four. 9 Q. And who are they? Tracy Tinsley, Robert Moreland, Joe Vale, and 10 Α. 11 Sue O'Leary. 12 And who do you report to directly? 0. 13 Α. Hershell McCarty. Do you report to anybody else directly? 14 Q. 15 Α. NO. Does a man named Todd Arnold still work for 16 0. 17 Duke? 18 No, he does not. Α. 19 Do you know when he left Duke? **Q**. 20 I don't recall the exact year. Α. 21 Was it more than two years ago? Q. 22 A. Yes. 23 Q. Do you know who serves in his role now? 24 That role has changed substantially over the Α. 25 I would suppose the most equivalent to that years.

1 would be Lee Mazzocchi.

2 Q. And when Mr. Arnold was with Duke, did you 3 report to him?

4 A. No, I did not.

5 Q. Did he report to you?

6 A. No, he did not.

7 Q. So did you report to the same boss?

8 A. No.

9 Q. What are the minimum capabilities required 10 for a meter to be considered a "smart meter"?

A. So the typical definition of a smart meter is a meter that has two-way communication capabilities as well as capabilities to measure energy usage in intervals, interval frequencies less than the monthly intervals that an old analog meter would.

Q. When you say "less than monthly," what's atypical interval that the smart meter is measuring?

A. It's different by jurisdiction, and it's really driven by the requirements for the rates in that jurisdiction. So we've got some that are 15-minute interval, and we have some that are 30.

Q. Do you have any that are more than 30?A. No.

Q. So all smart meters that Duke uses collect interval data of at most every 30 minutes?

1 A. Correct.

2 Q. Is an AMI meter the same thing as a smart 3 meter?

4 A. Yes.

Q. So, again, I may go back and forth and say
"AMI meter" or "smart meter" throughout the deposition,
and we'll understand that I mean the same thing?

8 A. Sure.

9 Q. How long have smart meters been available in 10 the market?

11 A. I would say, to the best of my knowledge, the 12 2005 timeframe, 2004 potentially.

Q. Are the residential Echelon meters that Dukebegan installing smart meters?

15 A. Yes, they are.

16 Q. And when did Duke begin installing those in 17 Ohio?

18 A. Early 2008.

19 Q. Another point of clarification. I'm

20 generally talking about Ohio. If I want to talk about

21 other states, I'll specify. I'll try my best to say

22 Ohio whenever possible.

23 A. Okay.

Q. But on questions like that, I'm referring toOhio since this is an Ohio proceeding.

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1 A. Okay.

2 Did Duke know what a smart meter was when it **0**. 3 began installing those Echelon meters? MS. WATTS: Objection as to form. 4 5 THE WITNESS: Yes. 6 BY MR. HEALEY: 7 Would you characterize Duke's Smart Grid 0. deployment in Ohio as successful? 8 9 Α. Yes, I would. 10 And what are the reasons that you think it's Q. 11 been successful? 12 So from a metering perspective, we eliminated Α. 13 walk-by reads. So we went from a walk-by read solution to a remote read solution. We have a lot of indoor 14 15 meters in the Cincinnati area, and so by going to the 16 automated reads, we increased our percent of estimated 17 reads -- or decreased our percent of estimated reads. So we have a lot more accurate billing, if you will. 18 19 we provided remote disconnect/reconnect 20 capabilities which is a convenience to our customer no 21 longer having to schedule appointments and sit around 22 and wait for a tech to arrive to perform that. 23 I will also say on the meter reading piece of 24 it, we saw a 90 percent improvement in our safety 25 incidents by eliminating the staff of meter readers.

We also have provided customers with hourly interval usage data via the portal for them to view, and by viewing that data, they can see their usage patterns, and if they so desire, they can change their usage habits and try to reduce their usage by their bill.

And then as we talk about Smart Grid as a 7 whole. on the distribution side of things with what we 8 9 did there with the distribution automation work, we 10 improved our SIAFI, which is the System Interruption Average Frequency Index, a common index across electric 11 12 utilities that measures the frequency of outages. We 13 reduced that, so we had significant reliability improvement as a result of the distribution automation 14 15 portion of the Smart Grid.

16 Q. Anything else?

17 A. I think that's most it.

18 Q. That's most it, or it is it?

19 A. That's it, to my recollection.

Q. Thank you. Is there anything that Duke couldhave done better?

A. Nothing that comes to mind, no.

Q. I would like you to turn to page three of your testimony. Starting on line eight, you mention that Duke has two AMI metering environments. Do you

1 see that?

2 A. Yes.

Q. And this is again for purposes of the record.
One of those systems uses Echelon meters, correct?
A. Yes.
Q. And you refer to that as the node

7 environment?

8 A. Yes.

9 Q. And so if I refer to the Echelon metering 10 system, the node system, or node environment, you'll 11 know I'm talking about what you describe as the node 12 environment, correct?

13 A. Yes.

Q. And then the other AMI metering environment that you identify uses Itron electric meters, and you refer to that as the mesh environment, correct?

17 A. Yes.

Q. And so similarly, if I refer to the Itron metering system or mesh system or mesh environment, you'll understand that I'm talking about the mesh environment that you're describing on page three around line 12, correct?

A. Yes, correct.

Q. Can you turn to page eight of your testimony, please? I'll direct your attention to Figure 2. I'm

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just going to start by noting that according to this 1 2 figure, there are about 626,000 Echelon electric meters and 103,000 Itron electric meters. Do you see those 3 numbers? 4 5 A. Yes, I do, as of January 31, 2017. 6 Do you have updated numbers for those? Q. 7 I do not. Α. 8 Now, according to this figure, the Echelon Q. electric meters are paired with Oracle EDMS, correct? 9 10 Yes, they are. Α. Q. And what is Oracle EDMS? 11 It is a meter data management system. 12 Α. 13 Q. And I believe at times this has been referred 14 to as the first generation Oracle system. Is that 15 right? 16 A. Yes, correct. 17 And the Itron electric meters are paired with 0. 18 Oracle MDM. Do you see that? 19 Yes, correct. Α. Q. And what is Oracle MDM? 20 21 It is basically still a meter data management Α. 22 system, but it is a generation two, if you will, meter 23 data management system. 24 And what is a meter data management system? 0. 25 A meter data management system is the system Α.

1 that houses all the interval data, and depending --

2 there's some differences between the EDMS and the MDM.

And I'll kind of describe the MDM. It performs the VEE
function, which is validation, editing, and estimation,
on all the interval data, and then it sends billing
determinants to our CIS system to bill based on that
usage.

8 Q. And the CIS system, what is that?

9 A. Customer information system.

Q. You mentioned that the MDM performs VEE. Canyou tell me again what VEE stands for?

12 It's validation, editing, and estimating. Α. So 13 VEE functionalities in the past typically took place in the customer information, the CIS systems, but with the 14 15 introduction of MDM, that occurs in the generation two meter data management system, and it's basically making 16 sure that you have all of the correct data. It checks 17 18 to make sure that data is in line with the previous month's data, validations to make sure that we've got 19 20 good reads and good accurate information, and then if 21 it's missing data, it will estimate and edit.

Q. Are you familiar with the phrase "billingquality data" or "bill quality data"?

24 A. Yes.

25 Q. Can you tell me what that is, please?

A. That is data that has gone through the VEE
 routine.

Q. So if data has not gone through the VEE routine, then it is necessarily not billing quality data?

6 A. That's correct.

Q. Is it fair to say that EDMS and MDM generally
8 serve the same purpose, both being meter data
9 management systems, just that the MDM is the newer
10 software?

A. Yes, with the exception that the EDMS, the early version, did not have scalable VEE functionality for interval usage data.

14 Q. Now, you say "scalable VEE." Can you tell me 15 what that means, please?

A. Scalable in the amount of the meter volumethat it was handling.

Q. If you were designing a distribution system from scratch, would you design it to use two different meter data management systems?

21 A. No.

Q. Is it efficient from a cost perspective for a
utility to use two different data management systems?
A. It depends on the enhancements or

25 functionalities that are different in between the two

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1 systems. So the decision to go to the MDM, the Oracle 2 MDM, the second generation was made because it did 3 provide more enhancements, more functionalities than 4 the original gen. one EDMS. So in that case, it does 5 make sense financially to enhance to that gen. two 6 system.

Q. And it's Duke's I guess goal through the
proposed AMI transition that eventually you would use
the MDM for everything, correct?

10 A. That's correct, yes.

Q. Does Duke use both EDMS and MDM in all of itsservice territories?

13 A. Yes, it does.

14 Q. And is Duke --

A. Let me take that back. I believe it's just
the Ohio, Kentucky, Indiana, and then our Duke Energy
Carolinas. It's not utilized in Duke Energy Progress
or Duke Energy Florida.

19 And what system are they using there? Q. 20 I'm not sure. They don't have a meter data Α. 21 management system per se, because they were in the 22 process of making that decision when we merged with 23 them, and they decided not to go with that expense 24 until we merged and deployed AMI in those jurisdictions 25 and utilized the enterprise MDM.

Do you use a meter data management system if 1 Q. 2 you don't have AMI meters? 3 A. No, we don't. Q. When Duke began its Smart Grid deployment in 4 5 Ohio, did it plan to use two different meter data 6 management systems? 7 No. it did not. Α. 8 when did Duke purchase the second generation Q. 9 MDM? 10 If my memory serves me correct, I believe it Α. 11 was sometime in 2013. 12 Do you know when the second generation MDM Ο. 13 became available? 14 That same year. Α. 15 Coming back to Figure 2 on page eight of your 0. testimony, I notice that both the EDMS and MDM have 16 17 arrows pointing to Duke Energy CMS. Do you see that? 18 A. Yes. 19 O. And what is that? 20 A. That's the more specific name for a customer 21 information system, CIS. So that one stands for 22 customer management system, I believe. 23 And then what is the CMS doing with the 0. 24 information it gets from EDMS and MDM? 25 It takes the bill determinants that it gets Α.

1 from the MDM and EDMS to calculate the customer's bill.

Q. When you say "bill determinants," are youreferring to kilowatt hours?

4 A. Yes.

5 Q. Anything else?

A. Well, demand read information for customers7 that are on rates that require demands.

Q. I would like to turn to page six of your 9 testimony now, starting on line 20. Starting on line 10 20, you note that, "Echelon began manufacturing AMI 11 meters with the Form 2s Class 200 meter type, which is 12 primarily used by residential customers." Do you see 13 that?

14 A. Correct.

Q. Is that the type of residential meter that
most of Duke's residential customers have in Ohio?
A. Yes. it is.

Q. Are these the meters that Duke chose when itfirst started implementing its Smart Grid program?

A. Well, it chose Echelon as the meters, yes,
and that was the meter type that they were

22 manufacturing.

Q. Did Echelon manufacture other meter types atthat time?

25 A. They did not.

O. When did Duke issue RFPs for the initial 1 2 Smart Grid deployment? 3 I wasn't a part of that. I didn't come into Α. the program until late 2018, and that was done prior to 4 5 that. 6 Q. You said late 2018. Do you mean 2008? 7 A. 2008, yeah. I'm sorry. Q. When did Duke select Echelon as the meter 8 9 supplier? A. That would have been sometime in 2017 --10 2007. I'm sorry. I'll be stuck on that now. 11 12 Q. When was the first residential Echelon meter 13 installed? A. I believe it was in March of 2008. 14 15 Q. Do you know when the first communication node 16 was installed? 17 It would have been that same time. Α. 18 Were you one of the people at Duke that was Q. 19 responsible for choosing Echelon? 20 Α. NO. Q. Who was involved in that decision? 21 22 I don't recall all the individuals. It was Α. 23 our emerging technology office, ETO office, that made 24 that decision, and I don't recall exactly who at that 25 time that was.

Q. Do you know any of the people that were 1 2 involved in that decision? David Mohler, David Masters, and I believe 3 Α. Matt Smith are the three names I remember from that 4 5 group. 6 Q. Anybody else? 7 Α. NO. Q. Do you know if any of those three individuals 8 9 you've just identified still work for Duke Energy? None of them do. 10 Α. what other technology options did Duke 11 Q. evaluate at the time that it chose the node solution? 12 13 Α. I do not know. I wasn't part of that. Q. What did Duke believe were the advantages of 14 15 the node solution over other meter communication networks available at the time? 16 17 I do not know. Α. 18 Do you believe there are advantages of the 0. 19 node solution over other meter communication networks? 20 MS. WATTS: Objection as to form. 21 THE WITNESS: NO. 22 BY MR. HEALEY: 23 Why did Duke ultimately decide to use the 0. 24 node solution? 25 I don't know. I wasn't part of that. Α.

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Do you know how the cost of the node solution 1 0. 2 compared to other options available at the time? 3 Α. NO. Q. Was the Itron mesh system available for 4 5 residential customers at the time that Duke chose the 6 node solution? 7 I can't confirm that, no. Α. Coming back to the Form 2s Class 200 meter, 8 Q. did Duke install any other types of meters for 9 residential customers other than that one? 10 11 As far as the Echelon-type meter? Α. NO. Can you turn to page seven of your testimony. 12 Q. 13 please? And I'll direct you to line three. There, there's a sentence that reads, "After analyzing other 14 15 AMI environments, the company standardized on the Itron AMI mesh environment and installed electric AMI meters 16 17 manufactured by Itron for most of its commercial/ 18 industrial electric customers and any additional customers who could not be served by an Echelon Form 2s 19 20 Class 200 AMI meter." Do you see that? 21 Α. Yes. 22 What other AMI environments did Duke analyze Q. 23 in this context? 24 A. Well, in this context, I was not part of it, 25 but to my knowledge, we looked at the Silver Spring

network solution, Sensus, Itron, Echelon AMB solution, 1 the node solution. I'm thinking there was a fifth one, 2 but I can't recall. 3 when did this analysis take place? 4 Ο. 5 Α. In 2014, I believe. 6 Coming back to the language where you say the Q. 7 company standardized on the Itron AMI mesh environment, when did that occur? 8 At that same time. 9 Α. 10 So prior to 2014, were any smart meters 0. deployed for nonresidential customers as part of the 11 12 Smart Grid initiative? 13 Yes. Α. Q. What type of meters were nonresidential 14 15 customers getting prior to 2014? 16 Α. The Itron meters. 17 Okay. Let's come back to this. This says, Q. "After analyzing other AMI environments, the company 18 standardized on the Itron AMI mesh environment." You 19 20 said that occurred in about 2014? 21 Α. Correct.

Q. But prior to 2014, you were already
installing Itron meters for nonresidential customers?
A. Yes. So we needed a solution for the
nonresidential customers in Ohio and at that time chose

Itron to provide that solution. And then in '14, we
 did the larger RFQ, if you will, and at that time chose
 Itron as our standard solution for the enterprise.
 Q. Okay. So when you say "standardized" in this
 sentence, you're talking about across Duke

6 jurisdictions?

7 A. Yes.

8 Q. So prior to that, you had already made the 9 decision to use Itron in Ohio for nonresidential 10 customers?

11 A. That's correct.

Q. And when was that decision made for Ohio?
A. That decision was made either late 2012 or
early 2013.

Q. And before that decision was made to install Itron meters for nonresidential customers in Ohio, were nonresidential customers part of the Smart Grid deployment?

19 A. They were part of the deployment, yes.

Q. And what kind of meter did they have beforethe Itron meters in 2012 or 2013?

A. We did not deploy any for those type customers, for the larger C and I -- larger C and I customers that did -- and basically anything other than residential that Echelon did not provide a meter

solution for, we did not start those deployments until
 late 2012 with the Itron meters.

Q. So Echelon did not manufacture the type of
meters necessary for most of the nonresidential
customers?

6 A. Correct.

Q. So it would be true, then, that the
nonresidential customers were never part of the node
system; is that correct?

10 A. That's correct.

Q. Was it Duke's intent when it began deployment of the node system for both residential and nonresidential customers to be part of that system?

14 A. To be part of the Echelon system, yes.

Q. And Duke was aware at the time it selected Echelon that it did not at that time manufacture the type of meter necessary for most nonresidential customers, correct?

A. Correct. I mean, they actually started manufacturing the Form 2s that's mentioned in my testimony for residential customers. They manufactured that specifically for our deployment with plans to manufacture all the other meter forms for all the other customers classes, as well. They just never went as far as developing any meters past that residential

1 meter.

2 Q. So this Echelon Form 2s Class 200 AMI meter3 was designed specifically for Duke?

A. Not specifically for Duke. We were the only customer at that time, but it was designed to meet the ANSI standards that would apply to any utility in the United States.

8 Q. Did that meter exist before you signed a 9 contract with Echelon to provide meters for Duke in 10 Ohio?

A. To my understanding, it did not. I don't know if it was in the process or where they were at in the process when we signed it, but to my understanding, it was not marketable, meaning that utilities could purchase it, at that time.

Q. Did Echelon have other AMI meters availablefor utilities prior to Duke's deployment?

18 A. Not in North America, but in the European19 countries, they do.

20 Q. Now, you mentioned that the Itron meters for 21 nonresidential customers began to be installed in late 22 2012 or early 2013; is that correct?

A. Correct.

Q. What meter data management system were theyon at the time?

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They fed into the second generation MDM. 1 Α. 2 Did the PUCO approve Duke's decision to start Q. 3 using the second generation MDM? I can't tell you specifically if they did or 4 Α. 5 not. 6 Did the PUCO approve Duke's decision to begin 0. installing Itron meters for nonresidential customers? 7 8 They were aware that we were installing them, Α. 9 and they were aware of the second generation MDM, as well. I don't know if it required specific approval. 10 11 That's not my expertise. Q. When you say they were aware, how were they 12 13 made aware? In the midterm -- I believe in the midterm 14 Α. 15 review, if I recall correctly. 16 Q. And by midterm review, you're talking about 17 the report done by MediView? 18 Α. Yes. 19 And so your understanding is that the 0. 20 MediView report identified the use of the second 21 generation MDM and the use of Itron meters for 22 nonresidential customers? 23 I don't recall exactly if it did. Α. I'm 24 thinking that we had those discussions, but I don't 25 know if it was in their report or not.
Q. Other than the Mediview report, do you have
 any reason to believe that the PUCO was aware of Duke's
 decision to use Itron meters in the second generation
 MDM?

5 A. The other way they would have known is I 6 believe through my testimony that I filed with the 7 annual Smart Grid cost recoveries. I believe we 8 mentioned in my testimony in those cases about the 9 Itron solution.

10 Q. Do you know when the first time you filed 11 testimony identifying the Itron solution was?

12 A. I do not.

Q. Does Duke currently have some residentialcustomers with Itron meters?

15 A. Yes.

16 Q. Why do some customers currently have Itron 17 meters?

A. We started what we call a business continuity project about midyear this year where we transitioned some -- or began to transition some residential customers from the Echelon solution to the Itron. Q. Other than those customers that received an Itron meter through the business continuity effort, are

24 there other residential customers that have an Itron

25 meter?

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A. Yes, there are. So some of the larger -there are some larger residential customers that require a 320-amp meter which Echelon did not manufacture, and so as part of the project we started in late '12, early '13 included some residential customers that required a meter outside the 200-amp meter.

Q. Is that what's referred to as a demand meter?
A. No. Demand meters were also deployed for
some of our very large residential customers that are a
demand rate.

Q. Okay. So some residential customers have Tron because of their specific needs, and then some have it because of the business continuity effort?

15 A. Correct.

Q. Are all residential customers with Itronmeters on the MDM?

18 A. Yes.

Q. Is it possible to use EDMS with a residentialItron meter?

A. It's probably possible, but we did not designit that way. Functionally it could occur.

Q. Are there any residential customers with
Echelon meters that are on the second generation MDM?
A. Yes.

Q. And who would those customers be?
 A. We had a time of use pilot that was taking
 place sometime in that 2012-'14 timeframe, and so we
 manually migrated those customers with Echelon meters
 into the MDM so that we could perform the VEE function
 for the interval data from those meters for billing
 purposes.

Q. Are there any customers still on a time of9 use rate, residential?

10 A. I do not know.

11 Q. I would like to understand this manual 12 migration process. Can you explain to me how that 13 works?

A. I can't give you any details, other than I know it was a manual process to move those meters and, you know, the interfaces between Echelon and MDM, developing that so that those could be migrated over to MDM.

19 And once somebody has migrated over, are they 0. 20 on MDM even if they get off the time of use pilot? 21 Again, I don't know if those customers are Α. 22 still on time of use or not, but there would be no 23 reason to move them back to EDMS that I'm aware of. 24 Q. Are there any alternatives to the manual 25 migration process that would allow a customer with an

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Echelon meter access to a time of use rate? 1 2 Yeah. It would take a large effort to Α. transfer all the Echelon meters from EDMS to MDM. 3 When you say "large effort," what do you 4 Q. 5 mean? 6 Costly. Α. 7 Did Duke evaluate whether it's possible to 0. use some kind of software translation program to 8 9 convert EDMS information into MDM format? I don't know the details. 10 Α. Do you know if any of the residential 11 Q. 12 customers on the time of use pilot had Itron meters? 13 A. Yes, they have. I'm sorry. I do not know, 14 no. 15 Q. Are there other types of migration other than manual migration? 16 17 Α. NO. 18 Let's turn to page three of your testimony, Q. Starting on line 17, you state that, "Echelon 19 please. 20 electric meters communicate with nodes via two-way, 21 low-voltage power line carrier technology." What is 22 power line carrier technology? 23 Power line carrier technology is where the Α. 24 information is sent over the actual power lines 25 themselves.

Q. Does Duke use this power line carrier 1 2 technology for anything else? Not this particular design of Echelon, no. 3 Α. Q. When you say "technology," is there some kind 4 5 of software that allows this information to be passed 6 through a power line or something else? 7 A. Yeah, there's hardware and software equipment that's required for that to happen. 8 0. What kind of hardware is installed to allow 9 you to send the information from the Echelon meters 10 11 through the power lines? A. You have to have the communication node at 12 13 the transformer that that customer is served off of and of course the meter itself. 14 15 Q. Anything else? 16 A. Well, then you need all the head-in systems 17 to manage the communications network as well as the 18 meter data. Does Duke use this power line carrier 19 0. 20 technology in jurisdictions outside of Ohio? 21 MS. WATTS: Objection. 22 THE WITNESS: The Echelon solution, no. 23 BY MR. HEALEY: 24 Do you know of any other utilities in North 0. 25 America that use this technology?

1 A. NO.

Q. Did Duke own any part of the power line
carrier technology before it decided to use Echelon as
the meter provider?

5 A. When you say "the power line carrier 6 technology," what are you --

Q. I'm referring to the power line carrier8 technology that you refer to in your testimony.

9 A. I don't know.

10 Q. You mentioned a head-in system. Can you tell 11 me what that is?

Yeah. So each of the meter types, meaning 12 Α. 13 Echelon and Itron, have what they call a head-in system which is a software application that basically accepts 14 15 all the meter data from the meters, manages the communications network itself for the nodes and the 16 communication devices. So it's actually two different 17 18 head-ins, one for the meters and one for the 19 communications. So it's just managing all of that traffic, and then from there, the information goes into 20 21 the meter data management system.

Q. Do you need a head-in system if you don'thave smart meters?

24 A. Yes.

25 Q. The head-in system that Duke used with the

1 Echelon meters, was it using that head-in system before

2 it had smart meters?

3 A. No.

Q. Is Duke proposing to switch to the mesh
environment in all of its jurisdictions?
MS. WATTS: Objection.
THE WITNESS: The mesh solution is our

THE WITNESS: The mesh solution is our
standard, so as we deploy in other jurisdictions, we
will deploy that solution.

10 MR. HEALEY: I'm going to mark the next 11 exhibit now. This is OCC interrogatory 06-123. This 12 is from the rate case, 17-32.

13 (Exhibit 3 marked for identification.)14 BY MR. HEALEY:

Q. Mr. Schneider, if you look at the bottom of this exhibit, OCC interrogatory 06-123, you'll note that you are identified as the person responsible for responses A, B, and C. Do you see that?

19 A. Yes.

Q. Did you provide the responses to thisinterrogatory?

A. Yes, I did.

Q. I would like to direct you to your response to question C where OCC asked you to define the term "marketable," and you say that "marketable" is a

1 standardized mature product sold and marketed by a

2 vendor partner. Do you see that?

3 A. Yes.

Q. Is the Itron mesh system a standardized5 mature product?

6 A. Yes.

7 Q. Why?

A. It's been on the market for at least -- well, J think about the last ten years, and there are several other utilities in the United States, gas, water, and electric, that utilize that solution.

Q. Are there other reasons that something might
be deemed in your mind a standardized mature product?
A. No.

Q. You mentioned that it's been on the market for around ten years. Is there a certain amount of time that something should be on the market before it would be mature in your mind?

A. My personal opinion is that, yeah, it would
be on the market and with other customers for a year or
more.

Q. What are the advantages of using astandardized mature product?

A. The advantages are that you've got a customerbase of other utilities that you can talk to about

their experiences with the solution to help you. Also
 have user groups with other utilities that had utilized
 that product as well.

Q. Does Duke in fact have those conversationswith other utilities?

6 A. Yes.

Q. Is Duke a member of any of the user groups8 that you just identified?

9 A. Yes.

10 Q. What other utilities does Duke communicate 11 with regarding the Itron mesh system?

A. BC Hydro, National Grid, San Diego Gas &Electric, Southern Cal Edison, to name a few.

14 Q. Have you been a part of those conversations?

15 A. Not as much as other people in my

16 organization.

17 Q. But you have been involved?

18 A. To some extent.

Q. What issues have you discussed with theseother utilities in this context?

A. They're more technical issues. You know, from time to time, issues pop up, and we discuss with Itron the solutions to those issues, and, you know, working with the other utilities and Itron to develop that solution. Q. Can you give me an example of one of these
 technical issues that you've discussed with another
 utility?

A. Yeah. A good example is migrating from the IPv4 protocol to IPv6. After our installations, we made that transition which was a pretty big transition, so we worked closely with BC Hydro and National Grid who had already gone through that transition.

9 Q. Was the Echelon node solution a standardized 10 mature product at the time Duke selected it for its 11 Smart Grid deployment?

12 A. I do not know.

Q. Do you know if there were any standardizedmature products on the market at that time?

15 A. I do not know.

MR. HEALEY: I'm going to mark the next
exhibit. This is in the ESP case, OCC interrogatory
04-219.

19 (Exhibit 4 marked for identification.)

20 BY MR. HEALEY:

Q. Mr. Schneider, again, I'll note at the bottom of this interrogatory, Number 04-219, you are

23 identified as the person responsible as to the response

24 here. Is that correct?

25 A. Yes, correct.

Q. You state that Duke knew from the start of its AMI deployment in Ohio that it was the first to install the Ambient node solution in North America, correct?

5 A. Correct.

Q. Are you aware of any other utilities that
7 installed the Ambient node solution in North America
8 subsequently?

9 A. Not in North America, but like I mentioned 10 earlier, several European countries.

11 Q. When you say Ambient node solution here, are 12 there other node solutions?

13 A. I'm not aware if there are or not.

14 Q. Do you know when Duke realized that the node 15 solution was not going be widely adopted by other

16 utilities in North America?

17 A. Can you repeat the question?

Q. Sure. Do you know when Duke realized that the node solution was not going to be widely adopted by other utilities in North America?

21 MS. WATTS: Objection as to form.

THE WITNESS: If I had to recall, it probably would have been in the 2011 timeframe when we knew that Echelon was not going to manufacture any meter forms beyond the Form 2s residential meter.

1 BY MR. HEALEY:

2 Do you know when in 2011 Duke became aware Q. that Echelon was not going to produce any meters other 3 than that one residential meter? 4 I don't recall the exact date or month. 5 Α. 6 Let's turn back to your testimony, please, on Q. 7 page three again. Starting on line 19, you say, "Each node is equipped with a cellular modem that allows for 8 data and signals to be sent to and received from the 9 node environment." Do you see that? 10 11 Α. I see it. Q. What is a cellular modem in this context? 12 13 Α. It is a modem just like in your cell phone that allows the data to be transmitted via the cellular 14 15 wireless network. O. And is that the same cellular wireless 16 17 network that we all use with our cell phone? 18 A. We utilize Verizon. 19 But Verizon has a single network that both **0**. 20 consumer cell phones and Duke's node system use, it's 21 not a separate network? 22 That's correct. Α. 23 So the Echelon meters themselves cannot 0. 24 connect to a cellular network; is that right? 25 Α. That's correct.

Is it possible to upgrade an Echelon meter to 1 Q. 2 connect directly to the cellular network? I can't tell you if it is or not. I mean, if 3 Α. you look at the Itron solution. it's basically a 4 5 cellular modem, card insert inside the Itron meter, so it's been done by other manufacturers. 6 7 Did Duke evaluate whether it was possible to 0. have a third party develop a cellular card that could 8 9 be installed into its Echelon meters? 10 Α. NO. In the Itron mesh system, does the meter 11 Q. itself connect to the cellular network? 12 13 There is a type of meter that Itron Α. manufactures called a direct connect meter that has a 14 15 cellular modem built into the meter. Q. And when would those meters be used for 16 17 residential customers? 18 Those meters would be used in remote areas Α. 19 where it's cost prohibitive to extend the mesh, the RF 20 mesh, out to pick up that customer. 21 So that direct connect meter is not the Q. 22 standard Itron meter that you would use for most 23 residential customers, correct? 24 Α. That's correct. 25 Did Duke evaluate an option for the AMI Q.

transition where it would in fact use the direct 1 2 connect meters for all residential customers? Not a formal one. The cost of those meters 3 Α. are about 75 percent -- 175 percent of the cost of a 4 5 mesh meter, so it just wouldn't have been a good 6 business case to spend that extra money when you can 7 develop a mesh a lot cheaper. 8 In the mesh system, what is a CGR? Q. It's a connected grid router or also known as 9 Α. 10 a Cisco grid router. O. And what does the CGR do? 11 A. CGR collects all of the meter reads from the 12 13 RF mesh meters. It collects that information, and then the 14 Q. 15 information goes from the CGR to the MDM? To the head-in. 16 Α. 17 And then from the head-in to the MDM? Q. 18 A. Correct. 19 Does the CGR then serve essentially the same Q. purpose as the node in the Echelon system? 20 21 Α. Yes. 22 But the big difference is, you need a lot Ο. 23 more nodes than CGRs, correct? 24 Α. Correct. 25 Let's look at page four of your testimony, Q.

starting on line eight. Starting on line eight, you
 say, "The mesh environment is so described because
 Itron electric meters communicate with one another and
 CGRs."

5 Why would two residential Itron electric 6 meters need to communicate with one another?

A. Well, that's the whole premise behind a mesh network in that the meter doesn't have to be close enough to the CGR to directly report its data to the CGR. So the meters all talk to each other to develop a mesh so that the information can eventually get back to a CGR. That's what allows you to have fewer CGRs than you do nodes in the node solution.

Q. What's the range of a CGR? How far away can a residential Itron meter be from a CGR and still connect to it directly?

A. There's a lot of variables. Depending on the topology, whether there's buildings, you know, in the area, trees, those sort of things, but on average, a thousand feet.

Q. So when you have a meter -- just using your thousand foot number but not holding you to that being a defined, you know, exact number, if you had a meter that was 3,000 feet away, that data from that meter would go to another meter and then to another meter and

then eventually get to the CGR, in layman speak? 1 2 Yes. If it could not directly go to the CGR, Α. 3 it would find other meters to make its path back to the CGR. 4 Q. And that's done through a wireless network? 5 6 A. Yes, 900 megahertz range. 7 And just to clarify, that's done through 0. 8 Verizon's cellular --9 Α. NO. 10 Q. No? 11 A. NO. Q. Okay. So the mesh system creates its own 12 13 network? A. That's correct. 14 Q. And then communicates among the meters and 15 16 the CGRs? 17 Α. Correct. 18 Got it. Q. 19 MR. HEALEY: I'm going to mark the next 20 exhibit now. This exhibit is the supplemental direct 21 testimony of Donald Schneider from PUCO Case Number 22 13-1141-GE-RDR. (Exhibit 5 marked for identification.) 23 24 BY MR. HEALEY: 25 Q. Mr. Schneider, you earlier referred to

various testimonies you filed over the years with 1 respect to Smart Grid. Is this one of those filings? 2 3 A. Yes, it is. Q. And I understand that I just handed this to 4 5 you and it was filed a couple of years ago, but are you 6 generally familiar and recall filing this testimony? 7 Α. Yes. 8 Can you turn to page four, please? And I'll Q. 9 direct you to line four. On line four of your 10 testimony from the 13-1141 case, you state, "Duke Energy Ohio has already implemented first and second 11 generation MDM systems." Do you see that? 12 13 Α. I'm sorry, which page? Sorry. We're on page four, line four of your 14 Q. 15 testimony from the 13-1141 case. Line four says, "a stipulation unless Duke 16 Α. 17 Energy Ohio implements an MDM system." 18 Yes. I was going to the next sentence. 0. 19 Α. Okay. So the next sentence says, "However, Duke 20 0. 21 Energy Ohio has already implemented first and second generation MDM systems." Do you see that? 22 23 Α. Yes. 24 when you say first and second generation MDM 0. 25 systems, the first generation would be EDMS?

A. Yes. 1 And the second generation would be MDM? 2 Q. 3 A. Yes. On line nine of that same page from your 4 **0**. 5 testimony in 13-1141 --6 I'm sorry, 11? Α. 7 Line nine. 0. A. Oh, nine. 8 -- you state, "In 2013, Duke Energy Ohio 9 Q. became aware of new technology that would better suit 10 11 the needs of the company and customers." Do you see 12 that? 13 Α. Yes. Is the new technology you're referring to 14 Q. 15 there the second generation MDM? 16 Α. Yes. 17 Q. Is it anything else? 18 Α. NO. 19 Starting on line 12 of your testimony on page **0**. 20 four -- this is your testimony from 13-1141 -- you 21 state, "The second generation MDM system has 22 functionalities which were not industry standard at the 23 time the first generation MDM system was implemented." 24 Do you see that? 25 A. Yes.

0. What are those functionalities? 1 I'm not familiar with all the 2 Α. functionalities, but the main one referenced here is 3 the scalable capability to provide VEE for interval 4 5 data. 6 Are you aware of any other functionalities 0. 7 that you're referring to in this sentence? I'm sure there were others, but I don't 8 Α. 9 recall what those were. 10 Is scalable VEE now an industry standard for Q. 11 meter data management systems? 12 I don't know for sure. I would assume, yes. Α. 13 Q. were there meter data management systems available in 2009 that had scalable VEE functionality? 14 15 I don't know. I wasn't a part of that at Α. 16 that time. 17 Q. Let's go back to your testimony from the SSO 18 case, and I'm going to refer you to your Exhibit DLS-1 that is at the end of your testimony. Just to confirm. 19 20 this exhibit is the same in both your rate case and SSO 21 testimony, correct? 22 A. As I recall, yes. 23 O. And what is this document? 24 This is a high-level report of the analysis Α. 25 that Duke Energy performed in comparing the cost to

continue with the node environment versus transitioning 1 2 to the RF mesh environment. 3 Did you perform this analysis? Ο. I took part -- yes, I managed the development 4 Α. 5 of it. 6 who else assisted in preparing this document? Q. I'm sure there were several. Emma Goodnow 7 Α. 8 and Adam Anderson are the main two that I recall. 9 Do you recall any others? 0. 10 Α. NO. Q. What were their roles in preparing this 11 12 document? 13 Α. They are in part of our organization that provides the development phase of projects. 14 O. And that describes their roles. What did 15 16 they actually do with respect to creating this 17 document? 18 They gathered all the information to come up Α. 19 with the comparisons that you see in this analysis. 20 were they responsible for the assumptions Q. 21 that went into this analysis? 22 Α. Yes. 23 Did you take any part in making the Q. 24 assumptions for this analysis? 25 I reviewed the assumptions. Α.

Q. When you reviewed those assumptions, did you 1 2 make any edits to their work? 3 I don't recall. I mean, we had several Α. sessions reviewing it and making edits throughout the 4 5 way. 6 Did you personally make any of those edits? 0. 7 I personally may have suggested some of the Α. edits, but I did not personally make the edits. 8 9 Q. You had final signoff on everything in this 10 document, though, correct? 11 Α. Yes. Q. Now, this document compares the cost of 12 13 continuing the node environment to the cost of the transition to the mesh environment, correct? 14 15 Α. Correct. 16 It does not purport to compare the benefits 0. 17 of the two? 18 Α. It does not. 19 Did you do any analysis of the monetary Q. 20 benefits to customers under continuing the node 21 environment as compared to the transition to the mesh 22 environment? 23 There was no need to. It was strictly a Α. NO. 24 comparison on whether we would continue with the node 25 environment or whether we would transition to the mesh

1 environment.

2 I would like to focus now on the top box on Q. this diagram which is identified as "Total (All 3 Electric and Gas Costs)." Do you see the top box 4 5 there? 6 A. Yes. 7 Now, here you used a discount rate of 7.73 0. percent, correct? 8 To calculate the NPV, correct. 9 Α. Q. Why did you decide to use 7.73 percent as the 10 11 discount rate? 12 That was provided by someone in our financial Α. 13 organization. Q. Do you know what the basis for that number 14 15 is? 16 A. I do not. 17 Q. Did you perform the analysis on your Exhibit 18 DLS-1 with any other discount rates? 19 No, not to my knowledge. Α. 20 Under the heading "Continue Node Environment" Ο. 21 on Attachment DLS-1, is that for residential customers 22 only? 23 A. Yes, because they're the only ones that are 24 on the node environment solution. 25 So just generally speaking, when we refer to Q.

1 the AMI transition plan in your testimony, that's a

2 residential initiative, correct?

3 A. Yes, you could say that.

Q. The second row under "Continue Node
Environment" says, "EDMS to MDM Conversion." Can you
describe to me what this would involve?

A. Yes. So that is if we continued with the
node environment, those were the costs to convert from
the EDMS to the MDM for those residential meters.

10 Q. And what do you mean by "convert"?

A. Transition them or transfer them into thesecond generation MDM.

Q. Would that require a manual migration similar Q. Would that require a manual migration similar to the one that was done for customers that were in the time of use pilot earlier?

A. Well, it's all the design work and the actual design work to allow it to be an automatic migration so that you don't manually have to migrate meter by meter manually.

Q. So after this conversion takes place under
the continue node environment option, customers would
continue to use Echelon meters, but they would be
paired with the second generation MDM; is that right?
A. That's correct.

25 Q. There's a row marked "4G Communication Node

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1 Upgrade." Do you see that?

2 A. Yes.

3 Q. What does a 4G communication note upgrade 4 involve?

A. That involves the removal of all 140,000 or so -- all of the communication nodes that are out on the system today and upgrading them with a 4G cellular modem.

9 Q. When you say "remove," are you removing it 10 and then upgrading it and then putting it back?

11 A. Yes.

Q. This is projected to cost \$91,162,500
according to this exhibit. Do you see that number?
A. Yes, I do.

Q. What are the key components and assumptionsunderlying this amount?

A. The key components are the labor to remove the node, the labor to bring the device in and send it off to a third-party vendor to change out the cell modem from the 3G to the 4G, and then the labor to install the node back up on a pole.

Q. Did Duke evaluate whether it's possible to
install these 4G -- to make the upgrade without
removing the node?

A. That would have been a lot more costly. We

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would have had to purchase brand new nodes to do that. 1 2 So it's not possible to go out and make this Q. installation on site where the nodes are? 3 No, it's not. These devices, the cellular 4 Α. 5 modem is soldered in to -- it's not a plug-and-play card. The modem is actually soldered in on a board. 6 Does a CGR have a similar modem? 7 0. It has a similar modem. but it is a card 8 Α. 9 plug- and-play-type modem. 10 So on the CGRs, the card can just be taken Q. 11 out, and a new one can be placed in without the 12 soldering? 13 A. That's correct. O. What alternatives did Duke consider to this 14 15 node upgrade? 16 A. We didn't really consider any other 17 alternatives. I mean, there's several out there. Ι 18 think some of them were mentioned in some of the 19 discovery from OCC, but, you know, back-of-the-napkin 20 calculations to show that it's a lot more costly than 21 even, you know, the solution to continue the node versus the solution to transition to the mesh. 22 23 Is it possible to install a communication 0. 24 card directly in an Echelon meter to connect to the 4G 25 cellular network?

I think you asked me that earlier, and, you 1 Α. 2 know, again, other manufacturers do it. Whether the Echelon meter would have that capability, I don't know. 3 Did Duke evaluate that option and the 4 Q. 5 potential cost of that option? 6 Α. NO. There's another row marked "Communication 7 0. Device Failures." This is on your DLS-1 again. Do you 8 9 see that row? A. Yes, I do. 10 What communication devices are you referring 11 Q. 12 to here? 13 Α. The nodes. Q. Can you explain the basis for this cost 14 15 estimate? A. Yeah. Based on the failure rate that we've 16 17 experienced, you know, in that time period from 19 to -- you know, it's a 20-year analysis. So during that 18 time period, that's the total cost based on fail rates 19 20 that we're experiencing. 21 Q. Under the total column on the right, it has dates 2019 to 2038. Do you see that? 22 23 Yes. Α. 24 why did you decide to use this time period? Q. 25 That's a typical 20-year analysis is what we Α.

in the utility industry or at least at Duke use any 1 2 time we're evaluating, you know, the effectiveness or 3 calculating an NPV on alternative solutions. Why is that your typical time period? 4 Q. 5 Α. I don't know. 6 Q. What factors did you consider when using the 7 20-year time period on this document? 8 I just follow along with what we Α. 9 traditionally do. Q. Did you do any analysis of the net present 10 value of these two options using any other different 11 12 time periods? 13 Α. NO. Q. Why not? 14 15 Didn't see the need to. This aligns with our Α. 16 proposal. 17 Does your analysis here on Attachment DLS-1 0. 18 include any costs that Duke might incur in 2017 and 19 2018? 20 A. No, it does not. 21 Q. Why not? 22 2017 and '18 is kind of what we call our Α. 23 business continuity plan where we are removing nodes in 24 order to put them in stock, because the vendor is no 25 longer manufacturing them. So in order to keep the

system running, we needed to remove some nodes so we 1 2 could have them in stock as replacements for failures. And so would the costs incurred in 2017 and 3 0. 2018 have the same impact on both the continued node 4 5 environment and transition to mesh environment? 6 Α. Yes. Under the "Continue Node Environment" 7 0. 8 section, monthly cellular costs are 33,216,510. Do you 9 see that? 10 A. Yes. And then under the transition to mesh 11 0. 12 environment, the monthly cellular costs are 14,237,970. 13 Do you see that? 14 Yes. Α. 15 Can you explain to me why the costs are so Q. much higher for the continue node environment? 16 17 Yeah, because there is a cost per device Α. 18 based on the Verizon contract. And so in the continue 19 node environment, there's 144,000 nodes out there that 20 we're paying a fee on, but under the transition to 21 mesh, I believe this analysis estimated a thousand CGRs and then some direct connect meters to equate to the 14 22 23 million monthly cost. 24 Does Verizon always charge per device? 0.

A. I'm not in charge of our contracts, so I

1 couldn't tell you.

Q. Do you know if that was an issue that Dukeattempted to negotiate with Verizon?

4 A. I do not know.

Q. The line under the continue node environment on Attachment DLS-1 for vendor maintenance is about 56 million for the continue node environment and then 10.6 million for the transition to mesh environment. Do you see those numbers?

10 A. Yes, I do.

Q. Again, can you explain why the vendor
maintenance cost is so much higher for the continue
node environment?

Yes. The vendor maintenance costs I believe 14 Α. on both these situations -- I know for sure on the 15 16 continue node environment -- is on a per-device rate. 17 So, again, it's 144,000 nodes as compared to only a 18 thousand for the mesh, and then of course each of them 19 have a fee per meter on the meter side which would be 20 equivalent. But the big driver there and the 21 difference is having to pay that per-device vendor 22 maintenance on the 144,000 communication nodes. 23 I would like to move to the bottom box now on 0.

24 your Attachment DLS-1. This one is marked "Gas Costs 25 Only"?

1 A. Yes.

Q. The net present value of the continue nodeenvironment on the gas costs only analysis is

4 34,004,158. Do you see that?

5 A. Yes.

Q. And then the gas costs only NPV for the
transition to mesh environment is 35,349,165. Do you
see that?

9 A. Yes.

Q. Why do you propose transitioning to the mesh environment for gas if continuing the node environment has a lower NPV?

A. It's not economically feasible -- well, it's just not economical to have two different systems to capture the reads. I mean, the whole purpose of one solution that can capture both the gas and the electric reads.

18 Q. How are you defining "economical" in your 19 response?

A. The overall cost to be able to perform thatfunction.

Q. So help me understand this. If "economical" means overall cost and the overall cost of continuing the node environment for gas is lower than for the mesh environment, how is that not more economical?

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A. Well, when you look at the overall solution for gas and electric, it's more economical. Yes, focusing just on gas, it's for the most part pretty even outside of the \$1.3 million difference, but that alone would not drive us to have all the additional costs of a second meter collection system just for gas.

Q. Would it not be possible to transition8 electric to the mesh and keep gas on the node?

9 That would be impossible. We would still Α. have all the costs of the nodes themselves. Let me 10 take that back. Out of the 144,000, roughly 30 -- I 11 12 believe 30 to 40 percent of those are combination nodes 13 which are collecting gas. So 30 to 40 percent of the 144,000 nodes we would still have to have up in the 14 system, so 30 percent of these node-related costs in 15 the continue node environment would still be costs for 16 17 that gas system.

Q. And those costs are incorporated in your third box, "Gas Costs Only," under the continue node environment, correct?

A. The way the gas and electric costs were provided in this breakdown was just by the customer count which is how we typically allocate cost between gas and electric. So if it's a common device, meaning for gas and electric, we allocate it on this percentage

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1 which is basically the percentage of customers.

2 So the third box, "Gas Costs Only," where Q. 3 you're creating an NPV for the continue node environment, that's not the actual cost to continue the 4 5 node environment for gas customers? 6 A. Yes, that is actually what it would cost 7 based on how we allocate cost. 8 So if you were to continue the node Q. environment for the gas customers only and transition 9 10 to the mesh environment for electric, some of the costs of the AMI transition for the electric would get 11 12 allocated to gas customers? 13 No. Again, if we chose that scenario, this Α. would look different. You're talking about two 14 15 different scenarios. 16 Okay. So let's clarify, then. In the second 0. 17 box, we have electric costs only, correct? 18 Α. Correct. 19 And in the third box, we have gas costs only, 0. 20 correct? 21 Α. That's correct. So if we were to take the NPV of the 22 Q. 23 transition to mesh environment for electric and add 24 that to the NPV of the continue node environment for 25 the gas, that would not give you the actual cost of

1 doing that option; is that correct?

A. No. That gives you the actual cost of continuing the node environment for both gas and electric. Where you were going at was continuing the node environment for the gas only. This doesn't show -- this is not an analysis for continue with the gas only.

Q. Okay. So what I'm trying to understand is --9 let's take a step back. Let's look at the second box. 10 That's electric costs only.

11 A. Right.

Q. The NPV of transition to mesh environment forelectric only is 99,357,188, correct?

14 A. Correct.

Q. And then in the third box, the NPV of continuing the node environment for gas only is 34,004,158, correct?

18 A. Correct.

So if we were to transition to the mesh 19 0. 20 environment for electric customers and continue the 21 node environment for gas customers, could we add those 22 two numbers together and get the cost of that option? 23 It would be a completely different NO. Α. 24 analysis that you would have to perform, because your 25 continue node environment cost would reflect only the

cost associated with the gas, and then your transition 1 2 cost would be just for electric. I mean, you would 3 have to do a completely different analysis. Has Duke in fact done that analysis? 4 Q. 5 Α. NO. MR. HEALEY: I'm going to mark the next 6 7 exhibit. This is OCC interrogatory 04-283 from the ESP 8 case. (Exhibit 6 marked for identification.) 9 10 BY MR. HEALEY: Mr. Schneider, if you look at the second page 11 0. 12 of this document, you'll note that you are the person 13 responsible for the response to this interrogatory. Do 14 you see that? 15 Α. Yes. 16 Q. And did you in fact provide the response to 17 this OCC interrogatory 4-283? 18 Yes, I did. Α. 19 I would like to direct you to question F. **0**. 20 OCC asks, "Did Duke consider automated meter reading 21 (AMR) as an option to obtain monthly gas meter reads as opposed to upgrading the node AMI environment? And if 22 23 so, please list the reasons why this alternative is not 24 being pursued." 25 And then your response is, "Duke Energy does

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not agree with the assumption that AMR for gas 1 2 customers is an alternative to upgrading the entire AMI 3 environment. Notwithstanding the objection, changing gas AMI modules to gas AMR modules would create new 4 5 meter reading costs to be borne exclusively by gas customers due to reduced efficiencies of a shared AMI 6 7 solution." I apologize for reading all of that, but is 8 that your response?

9 A. Yes.

10 Q. You mention that it would create new meter 11 reading costs. Did you do an analysis of what those 12 costs would be?

13 A. No.

14 MR. HEALEY: I would like to mark another 15 exhibit. This is OCC interrogatory 09-190, and this 16 one is from the rate case, 17-32.

17 (Exhibit 7 marked for identification.)18 BY MR. HEALEY:

Q. Mr. Schneider, again I would note that you
are the person responsible for this interrogatory
response, correct?

A. Correct.

Q. Question B asks, "Why does Duke collect gas
meter reads on a daily basis?" And you give various
answers. The first one is that, "Gas meter reads are

collected daily for early detection of zero usage." 1 2 what does Duke do with that information? 3 A. The detection of zero usage helps us in determining if there's potential theft or if the meter 4 5 module itself may have gone bad. 6 Q. What benefits does that provide to customers 7 as compared to detecting zero usage on a monthly basis? It allows us to detect it much sooner so that 8 Α. we can -- again, if it's a faulty gas module, we can 9 get it replaced sooner so we don't have to estimate as 10 much usage. And, again, if it's theft, we can address 11 12 it a lot sooner which could potentially lower 13 write-offs. Q. Do you know how many instances in a typical 14 15 month there are of detection of zero usage? 16 A. No, I don't. 17 Q. Is it more than 10,000? 18 I have no idea. It's our billing department Α. 19 that does that. 20 Do you know what the monetary value is of **0**. 21 this early detention? 22 I do not. Α. 23 You also state that gas reads are collected Q. 24 daily for early detection of usage on an inactive 25 account. Can you tell me what that means?
A. Again, so if an account has gone inactive and shut off, then if there's usage, then we know there's theft.

Q. And do you know how many instances in a
typical month there are of usage on an inactive
account?

7 A. I do not.

8 Q. You also state that this would create the 9 ability to provide daily usage information to customers 10 via the Duke Energy customer portal. Do you see that? 11 A. Yes.

Q. What can customers do with this information?
A. Similar to the electric, they can see their
usage patterns, and if they so decide, they could
change their usage habits to help reduce their bill.

Q. Have you done any analysis to determine whether customers who view their daily natural gas usage in fact change their usage habits?

19 A. No.

Q. Have you quantified the benefits of providing
customers daily usage information via the Duke Energy
customer portal?

MS. WATTS: Objection. Chris, when you say
"you," do you mean Mr. Schneider personally, or do you
mean the company?

MR. HEALEY: Let's start with Duke. 1 2 BY MR. HEALEY: 3 Has Duke quantified the benefits of providing Q. daily usage information to customers via the Duke 4 5 Energy customer portal? 6 Not for Duke Energy Ohio, no. Α. 7 Have you done it in other jurisdictions? 0. 8 A. Yes, we have. Q. Which jurisdictions? 9 MS. WATTS: Objection. 10 11 THE WITNESS: Indiana, Ohio -- or excuse me. 12 Indiana, Kentucky, and Duke Energy Carolinas. 13 BY MR. HEALEY: Q. And in any of those jurisdictions, have you 14 15 determined that customers who view their daily gas 16 usage via the portal in fact change their usage habits 17 as a result? I'm sorry. In reference to gas, it would be 18 Α. 19 no, no other Duke companies. 20 MS. WATTS: And again, Chris, when you say 21 "you," could you please clarify whether you mean 22 Mr. Schneider or the company? 23 MR. HEALEY: Yes. 24 MS. WATTS: Thank you. 25 BY MR. HEALEY:

Okay. So just to clarify --1 Q. 2 I'm sorry. Kentucky would be the only one. Α. So in Kentucky, Duke has analyzed -- so in 3 Q. Kentucky, Duke has quantified the benefits to customers 4 5 as a result of viewing their daily gas usage through 6 the customer portal? 7 Α. Yes. 8 And what were the results of that analysis? Q. I don't recall the numbers, but it was 9 Α. calculated to show a customer benefit as part of our 10 11 business case for Duke Energy Kentucky AMI. Why didn't Duke do a similar analysis for 12 0. 13 Ohio? 14 Because we were not -- again, our analysis Α. was just continuing with the solution that was already 15 16 out there versus switching to the RF mesh solution, the 17 cost differences. 18 Q. You also state in your response that one of 19 the -- that Duke collects gas meter reads on a daily 20 basis to give it the ability to offer certain enhanced basic services for dual service customers. Do you see 21 22 that? 23 Yes. Α. 24 What enhanced basic services are you 0. 25 referring to here?

A. Well, you'll probably have to refer to Sasha 1 2 weintraub's testimony to get further detail, but similar to having more granular data on the electric 3 side allows us opportunities to provide additional 4 5 products and services that we cannot offer by just 6 having monthly meter reads. So the same would apply to 7 gas. By having more frequent readings available, there's the potential to offer certain enhanced basic 8 9 services to the gas customers. 10 But you personally don't know which enhanced **0**. basic services would be made available to customers as 11 12 a result of this on the gas side, correct? 13 Α. One I can think of is the Pick your Due Date. 14 Q. Can you think of any others? I don't know enough about the others to know 15 Α. 16 if they would apply to gas or not. Again, Sasha 17 Weintraub would be the witness that would be able to 18 help answer that. 19 Does Duke currently offer customers a Pick 0. your Due Date option? 20

21 A. Duke Energy Ohio or Duke Energy --

22 Q. Duke Energy Ohio.

A. Duke Energy Ohio provides -- no, it does not.
Let me take that back. I think we cannot for the
Echelon customers. We can for the Itron customers but

don't know if we've turned that functionality on or
 not. Sasha Weintraub would have to answer that. But
 we cannot provide Pick Your Due Date for the Echelon
 customers.

Q. Can you explain why you cannot provide it for6 Echelon customers?

A. I can't. Sasha Weintraub would have to8 answer that.

9 Q. Is there a technological limitation that 10 prevents it from being possible?

A. Again, that's not my area of expertise, so Icould not tell you.

Q. So do you see the availability of enhanced basic services as one of the advantages of the mesh system?

16 A. Yes, I do.

Q. Can third parties other than Duke offer
enhanced basic services using the technology that Duke
proposes to install through the AMI transition?

20 A. I don't know the answer to that.

Q. Let's come back to your Attachment DLS-1 at the end of your testimony. We discussed before that just generally speaking, various assumptions had to be made to create this document, correct?

25 A. Yes.

Q. Did you perform any kind of sensitivity 1 2 analysis to determine the extent to which the various 3 assumptions you made in this document affect the results? 4 5 A. No, not formally. When you say "not formally," did you do it 6 Q. 7 informallv? 8 We had discussions around it. Α. 9 0. Did you calculate the net present value of any other options other than continue the node 10 11 environment and transition to mesh environment? 12 we did not. Α. 13 Q. Did you calculate the net present value of transitioning the electric side to mesh but 14 15 transitioning gas to AMR? Did not. 16 Α. 17 MR. HEALEY: I just want to check. Are you 18 doing okay as far as --19 THE WITNESS: I'm fine. 20 MR. HEALEY: Okay. Everybody else good? 21 THE WITNESS: We only got five more minutes, 22 right? 23 MR. HEALEY: Close. 24 MS. WATTS: Can we go off the record for just 25 a second?

1 MR. HEALEY: Sure.

2 (Discussion off record.)

3 MR. OLIKER: Chris, this is Joe Oliker with 4 IGS. When you get a chance, I would also like to put 5 an appearance in. I've been here for a while. I 6 didn't want to interrupt your chain of thought.

7 MR. HEALEY: I appreciate that.8 BY MR. HEALEY:

9 Mr. Schneider, can you turn to page 14 of 0. 10 your testimony now? Starting on line 14, you state 11 that, "If Duke Energy Ohio does not receive necessary 12 regulatory approval and has to continue with the node 13 environment instead of undertaking the Ohio AMI meter 14 transition, the company estimates it would spend \$1 15 million in 2019 just to develop a long-term solution to address the node failure issue." Do you see that? 16

17 A. Yes, I do.

18 Q. What steps would the company take in this19 \$1 million process to develop a long-term solution?

A. We would have to work with vendors. No vendors manufacture nodes any longer, so we would have to go out through a FAQ or FRQ -- what is it? My acronym --

24 Q. RFP?

25 A. RFP or RFQ is what I was thinking. -- to

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vendors to see if we could get anybody interested in 1 manufacturing the nodes for us, and, you know, that's a 2 3 pretty lengthy process in terms of the design and everything else, requiring specifications and 4 5 everything to develop a solution to take place in the 6 current node environment. 7 Do you know about how many Duke employees 0. would be involved in this process? 8 I do not. 9 Α. 10 would you expect that you would personally 0. 11 oversee this process? 12 It would likely be another department in our Α. 13 grid solutions organization. What department would that be? 14 Q. 15 Probably our grid concepts group. Α. And who would be in charge of that? Or who 16 0. is in charge of the grid concepts group? 17 18 Ted Thomas. Α. And remind me, what group are you in? 19 **0**. 20 Grid solutions. Α. 21 Okay. So you're both within -- it's another Ο. 22 group within grid solutions? 23 Correct. Α. 24 Is it grid concepts? Q. 25 Correct. Α.

Q. And do you have a subgroup under grid 1 2 solutions? A. There are several subgroups under grid 3 solutions. 4 5 Q. Are you part of --I'm part of grid solutions, as well as grid 6 Α. 7 concepts is part of grid solutions. Got it. Okay. Would you personally be 8 0. involved in the process at all that you're describing 9 in your testimony here, page 14? 10 I see no need that I would need to be 11 Α. 12 involved, no. 13 Q. So others would develop this solution, and then you would be in charge of deploying it? 14 15 That's correct. Α. 16 So you would not -- you would personally not 0. 17 be involved in designing the new system? 18 That's correct. Α. 19 Has Duke done any analysis to determine **0**. 20 whether any solutions that come out of this 2019 21 analysis would have a lower net present value cost than 22 the proposals you outlined in your Attachment DLS-1? 23 Can you repeat that? I'm sorry. Α. 24 Sure. Has Duke done any analysis to 0. 25 determine whether any solutions that came out of this

2019 \$1 million process, how those costs would compare
 to the net present value costs in your Attachment
 DLS-1?

4 A. No.

Q. Let's turn to page nine of your testimony,
please. Starting at line nine, you state, "Ericsson is
no longer manufacturing communication nodes." Do you
see that?

9 A. Yes.

Q. Do you know if Ambient stopped manufacturingnodes before it was purchased by Ericsson?

A. I do not know. I don't believe they did.
They just went out of business. I mean, to my
knowledge, they were manufacturing them up to the point
they went out of business.

16 Q. Do you know when Ericsson stopped

17 manufacturing them?

18 A. Ericsson never did start manufacturing them.

Q. And I think I may have asked this before, or
you may have told me. Does anyone other than Ericsson
manufacture nodes?

A. Not of this type.

Q. Do you know any other company that has evermanufactured this type of node?

25 A. No.

O. When did Duke find out that Ambient or 1 2 Ericsson was no longer manufacturing these nodes? I can't recall when that was that Ericsson 3 Α. took over from Ambient, to be honest with you. 4 5 0. But at the time that Ericsson took over, 6 whenever that was, that was when you found out that 7 nodes would no longer be available? 8 Α. Correct. How did Duke find out? 9 0. 10 A. We were notified by Ambient that they were going out of business and would be purchased out by 11 12 Ericsson. 13 Q. Did Ambient give Duke any advance notice that it would no longer be manufacturing nodes? 14 15 I do not know. Α. 16 On page nine of your testimony starting at 0. 17 line 12, you state, "Additionally, communication nodes 18 have been failing at a higher rate than expected." Do 19 you see that? 20 A. Yes, I do. 21 Q. What is the rate of failure of the 22 communication nodes? 23 If I recall, 2016 was about four and a half Α. 24 percent. 25 Q. Four and a half percent per year?

Per year, yes, for 2016. 1 Α. 2 And you mentioned that it's higher than Q. 3 expected. What was the expected failure rate? 4 Α. Two percent. 5 Ο. When did the first node in Duke's Ohio system fail? 6 7 I don't know. Α. Q. When did Duke learn that the nodes were 8 9 failing at a higher rate than expected? 10 Α. I can't recall the exact year. 11 Was Duke aware that they were failing at a Q. 12 higher rate than expected before 2016? 13 Α. Likely so. O. Before 2013? 14 15 A. I couldn't tell you. 16 Q. When you say communication nodes have been 17 failing, what are the causes of the node failure? 18 Α. I do believe we provided in one of the discovery responses a list along with a number of 19 20 devices, a list of various reasons why they have failed and the number of devices that have failed for each of 21 22 those various reasons. 23 what are the different components that make 0. 24 up a node? 25 There is a collection device for the Badger Α.

gas module. There's a collection device for the 1 Echelon electric meter. I believe there's a 2 motherboard, and then there is a cell modem and 3 antenna. Those are the main components. 4 5 So of those -- I'm sorry. Is the antenna Q. 6 different than the cell modem? 7 Α. Yes. 8 So I've identified in your response five main Q. pieces, the cellular device -- sorry. Collection 9 device for gas, collection device for the Echelon 10 electric meters, motherboard, cellular modem, and 11 12 Is that right? antennae. 13 A. Yes. And among the node failures, is one of these 14 Q. 15 five the predominant piece that is failing? The cellular modems. 16 Α. 17 what steps did Duke take to correct the Q. 18 problem when it found out that the nodes were failing 19 at a higher rate than expected? 20 A. We followed our normal process, meaning we 21 went back to Ambient to try to understand, you know, 22 what was the cause, and, again, we narrowed it down to 23 the cell modem failures. Then we followed our normal 24 process of removing the device and replacing it with a 25 device that's in stock, and then either ourselves

repair if possible or sending it back to the vendor for 1 2 them to repair for us. 3 Now, you say you talked to Ambient. Does Q. that mean that this was taking place before Ericsson? 4 5 Α. Yes. 6 Is there a manufacturer's warranty for the Q. 7 nodes? There was a one-year manufacturer's warranty. 8 Α. Did Duke make any warranty claims in that 9 Q. 10 year? I don't recall. 11 Α. Do you know if Duke has filed any lawsuits 12 Q. 13 against Ambient or Ericsson for the failure of the 14 nodes? 15 Α. Not to my knowledge. Q. Does Ericsson provide repair services for the 16 17 failing nodes? 18 Α. Yes. 19 Let's turn to page 12 of your testimony, Q. 20 please. Starting on line 14, you state, "The company 21 has a support contract in place for node repair, but 22 with the higher-than-expected failure rates, Ericsson 23 is not able to keep up with the repairs." Can you 24 explain what that means? 25 A. Yes. So when Ericsson took over the

operation, they did not bring on everybody that was at 1 2 Ambient, because obviously they had no plans to manufacture the nodes, and so they had limited 3 resources that were able to keep up with the repair 4 work that we had available for them. 5 6 So when you need repair for a node that 0. Ericsson is going to perform, you take the node off the 7 Duke system? 8 9 A. Yes. Q. And then send it to Ericsson? 10 11 A. Yes. when you say they're not able to keep up with 12 0. 13 the repairs, are they refusing to repair any? They're not refusing to repair any, no. 14 Α. There's just a limit as to how many they can repair at 15 16 a time. 17 Q. So it's a delay issue? 18 A. Yes. 19 About how long does it take Ericsson to **0**. 20 repair one of the nodes when Duke sends it to Ericsson? I don't recall offhand. 21 Α. Is it more than six months? 22 Q. 23 I don't recall. I would guess not. Α. 24 Is it more than two months? Q. 25 I'm thinking it's probably a month, month and Α.

1 a half.

2 Q. And how many nodes can Ericsson fix in a 3 month?

4 A. I don't recall the number.

5 Q. Does Duke have any other vendors that are 6 repairing nodes other than Ericsson?

7 A. No.

Q. Has Duke explored the option of finding other9 vendors to repair the nodes?

10 A. NO.

11 Q. Does Duke have a contract with Ericsson that 12 requires them to repair faulty nodes?

A. To my knowledge, we have a contract that just
has a set price to repair nodes but does not require
them to repair nodes.

Q. Before Ericsson took over for Ambient, wasAmbient keeping up with its repairs?

18 A. I don't know.

Q. Did you consider the option of upgradingcommunication nodes to 4G whenever they need repair?

21 A. Yes.

Q. Does Duke in fact do that currently when anode needs repair?

24 A. Yes.

25 Q. If Ericsson continued to manufacture nodes,

1 would it still be necessary to transition to the mesh

2 environment?

3 A. In my opinion, yes.

4 Q. Why?

5 Α. Just because of the cost. You can see how even if they continued to repair nodes for us or if 6 7 they continued to manufacture them. just the cost associated with taking them all down and having to 8 9 convert them to 4G. And then even if they do that, we're still getting back a used node, and there's 10 potential for other components in that node to fail. 11 12 So, again, the cost to continue that node environment, 13 there's several challenges there.

Q. If the nodes had instead been failing at the expected rate of two percent, would it be necessary to do the AMI transition?

17 Likely not. Again, we probably would have Α. 18 done an analysis, because the other challenges were no longer manufacturing nodes and then the cost of taking 19 20 down 140,000-plus nodes and upgrading them with a new 21 4G cellular modem. So we would have looked at what 22 those costs were. So obviously when you look at that 23 analysis, all those costs would remain the same. 24 Really the only change in that analysis would be 25 reduced costs for a reduced fail rate.

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Q. Let's turn to page 11 of your testimony. On page 11 of your testimony starting at line 16, you state, "Adding to the challenge, the communication nodes are no longer being manufactured, but the company could work with the vendor to source a replacement 4G modem and antenna that could be retrofitted into the node." Do you see that?

8 A. Yes.

9 Q. By "vendor," are you referring to Ericsson 10 here?

11 A. Yes.

Q. Did you evaluate the cost of this retrofit?
A. Yeah. So that cost is included in the
repairs that they do for us today. I don't know the
exact cost for that retrofit.

Q. So currently when a node goes in for repair, it gets retrofitted with a 4G modem, I guess? Is that the right word?

A. And which also requires the antenna to beretrofitted.

Q. Okay. But under this -- in this sentence, it would be to do that for all of them, even the ones that aren't failing, correct?

A. Correct.

25 Q. And that's what it would take to continue the

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1 node environment in your Attachment DLS-1?

2 A. That's right.

Q. So the cost on DLS-1 for 4G communication node upgrade, is that what you're talking about here in this sentence on page 11, line 16 to 18?

6 A. Correct.

Q. Let's go to page nine of your testimony.
Starting on line 16, you discuss a business continuity
effort. I know we've discussed this a little bit. You
state in your testimony that you plan to remove 23,700
communication nodes and also replace 80,000 Echelon
meters and 48,800 Badger gas communication modules.

How many Echelon meters have been replaced todate in 2017?

15 A. I believe it's around 20,000.

Q. And how many Badger gas communication moduleshave been replaced in 2017?

18 A. I don't know that number, but it would be19 similar to the ratio of gas to electric here.

Q. Do you know how many nodes have been removed?A. I do not know.

Q. What is Duke's process for deciding which nodes to remove as part of the business continuity effort?

A. I'm trying to think how we decided that. We

went into areas where we could remove nodes that have not been out there. So there's a couple versions of the nodes that are out there. So we chose areas that had some of the latest version of the nodes so that we would have the most up-to-date equipment, if you will, that we were returning back to stock.

Q. What was Duke's process for deciding which8 Echelon meters to replace?

9 A. The process was to choose the nodes, and, 10 thereby, you just change out the meters that were 11 associated with those nodes.

12 Q. So it was based on the nodes?

A. Correct.

Q. The number of Echelon meters to be replaced under the business continuity effort is 80,000 compared to 48,800 for the gas communication modules?

17 A. That's correct.

Q. Why is the Echelon number higher than theBadger gas communication module number?

A. Because not every customer of ours is acombination gas/electric customer.

Q. So anybody that is a combination is going to get both under the business continuity effort; is that correct?

25 A. That's served off of that node, yes.

Q. Does Duke still plan to replace 80,000 1 2 Echelon meters by the end of 2018? 3 A. Yes. Q. And does Duke still plan to remove 23,700 4 5 nodes by the end of 2018? 6 Α. Yes. 7 Does Duke still plan to replace 48,800 Badger 0. 8 gas communication modules by the end of 2018? 9 Α. Yes. 10 MR. HEALEY: I'm going to mark the next exhibit. This is ESP case OCC interrogatory 4-202. 11 12 (Exhibit 8 marked for identification.) 13 BY MR. HEALEY: Q. Mr. Schneider, on the second page, you're 14 identified as the person responsible for OCC 15 16 interrogatory 4-202 in the ESP case, correct? 17 Correct. Α. 18 In your response to C, you state that the Q. total estimated cost of the business continuity effort 19 20 is \$24,196,551. Do you see that? 21 A. Yes, I do. Is that still the estimated cost of the 22 Q. 23 business continuity effort? 24 Α. Yes. 25 How much has Duke spent on the business Q.

continuity effort so far in 2017? 1 2 I believe it's right around ten million. Α. 3 MR. HEALEY: I'm going to mark the next exhibit. This is in the ESP, also, OCC interrogatory 4 5 6-295. (Exhibit 9 marked for identification.) 6 7 BY MR. HEALEY: 8 Mr. Schneider, on the third page of this Q. exhibit, OCC interrogatory 6-295 in the ESP case, 9 10 you're identified as the person responsible for parts A 11 to I, correct? 12 A. Correct. 13 Q. In your response to E, you state, "After the 14 business continuity efforts are complete by the end of 15 2018, Duke Energy Ohio will need to undertake additional efforts to replenish node inventory in 2019 16 17 if the AMI transition does not proceed as proposed." 18 Do you see that? 19 A. Yes, I do. Has Duke done any analysis of how much this 20 **0**. 21 would cost in 2019? 22 Α. NO. 23 Q. And how many more nodes would need to be 24 removed in 2019? 25 I don't know. Α.

Q. And how many more Echelon meters would need
 to be replaced?

3 A. I don't know.

Q. In your response to G -- let me go back a second. Do you know who at Duke would know how much this would cost?

A. It's an analysis that would have to be performed at the time, because it would be based on the failure rate, the current failure rate, you know, so that we would know how many we need. The current failure rate, the current replacement rate, and that sort of thing to really understand how many more we need to bring back into inventory.

Q. Would that be an analysis that you would do?A. Under my direction.

16 Q. And would you be the one that is determining 17 how many nodes and Echelon meters would need to be 18 removed or replaced?

19 A. Under my direction, yes.

20 Q. In your response to G in OCC interrogatory 21 6-295 in the ESP case, you state that, "Approximately 22 250 Echelon meters are installed each month." Do you 23 see that?

24 A. Yes.

25 Q. What are the reasons for these installations?

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A. well, they would be meters that have failed 1 2 for whatever reason. And I'll say, you know, the Echelon meters are performing quite well. We don't 3 have a concern fail rate there. There are some 4 5 locations where we installed nodes that if a new customer would move in in that area that we could feed 6 7 off of that node, we would install an Echelon meter. So it's a combination of replacements due to failures 8 9 and new customer adds.

Q. Is Echelon still manufacturing the metersthat Duke uses?

12 A. Yes.

Q. So whereas the nodes are not being manufactured and you have to take nodes offline to put back in inventory, you don't have the same issue with the Echelon meters, correct?

17 A. Correct.

Q. Does Echelon currently manufacture any other
types of meters other than the one that Duke Ohio uses
for residential customers?

A. Not in North America, no.

Q. Let's turn to page ten of your testimony now.Actually, before we do that, has Duke had any

24 conversations with Echelon about developing meters that

25 work in a mesh network?

1 A. Not to my knowledge.

Q. Has Duke had any conversations with Echelon
regarding upgrading Echelon meters to connect directly
to a 4G network?

5 A. Not to my knowledge.

Q. Let's look at page ten of your testimony now.
Starting at line 11, this is where you discuss the fact
that Verizon will be discontinuing its 2G and 3G
cellular networks?

10 A. Uh-huh.

Q. On line 15 -- sorry, on line 13, you state that, "Verizon originally planned to discontinue these networks earlier than 2022, but through Duke Energy's partnership with Verizon, it was agreed to extend the sunset to 2022." And then you say, "No further extension is expected."

What's the basis for your belief that no further extension is expected?

A. Well, I wasn't a part of those negotiations,
it was our sourcing organization. But from my
understanding in discussions with them, they drew the

22 line at the end of 2022.

Q. Has Duke asked for an extension beyond 2022?
A. I don't know if we have or not.

25 Q. Has Duke had any conversations with other

1 cellular providers other than Verizon?

2 A. Not to my knowledge.

Q. Do you know if other cellular providers are planning to continue their 2G and 3G networks after 2022?

6 A. I don't know.

Q. Is there a reason from a technology
8 standpoint that Duke must use Verizon's network as
9 opposed to another provider's?

10 A. Yeah. So the cellular cards that are in 11 these nodes are specific to Verizon. So if we even 12 wanted to switch to another provider, we would have to 13 replace that cellular modem.

Q. And did Duke analyze the cost of replacingthe cellular modems to use a different network?

16 A. No.

Q. And those cellular cards -- remind me if we discussed this already -- can they plug in, or are they soldered into the node?

20 A. They are soldered in.

Q. Do you know when Verizon plans to sunset its4G network?

A. I do not.

Q. Can you turn to page 11 of your testimony,

25 please? On page 11, line four, you state that, "Cisco

has already released a 4G CGR." Do you see that? 1 2 Yes. Α. When was that released? 3 Q. I was thinking it was about a year and a half 4 Α. 5 ago. 6 Do you know if Cisco is planning to release a Q. 7 5G CGR? I do not know. 8 Α. Do you know the cost of a Cisco 4G CGR? 9 Q. It's around \$4,500, if I recall. 10 Α. And the current CGRs that Duke is using for 11 Q. 12 its mesh network, are they 4G CGRs? 13 Α. I believe only one is a 4G. Well, at the 14 time when we gathered the information for this, you can 15 see up on line five, 23 of its current -- excuse me --233 of its current 234 CGRs would have to be converted 16 17 to 4G. At that time, only one was a 4G device. 18 Is Duke installing CGRs as part of the 0. business continuity effort? 19 20 Α. Yes. 21 Q. Are those 4G CGRs? 22 A. Yes. 23 I realize at the time you filed this, it was Q. 24 233 out of 234, but there are more than one, 25 presumably, now?

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1 A. There would be more now, yes.

Q. In your opinion, is the sunsetting of the 2G
and 3G network a bigger problem for the node
environment than the node failures?

5 Α. I think it's a combination of three things. The node failure rate which we know is more than double 6 7 what was expected and could continue to grow -- will likely continue to grow since we're refurbishing nodes 8 9 and not installing new nodes. And then the fact that we don't have a manufacturer of new nodes. I think 10 those two challenges are just as great, if not greater, 11 12 than the fact that we have to convert to 4G.

Q. Are the nodes failing at a high rate becauseof some kind of design defect?

A. I don't know the details. Like I said, it's
related to the modem itself, but I don't know the
details of why they're failing.

Q. Has Duke done any analysis of why they arefailing at a higher rate than expected?

A. None other than, you know, identifying whichdevice is failing.

22 MR. HEALEY: I'm going to mark the next 23 exhibit now. This is OCC interrogatory 2-36 from the 24 rate case, Number 17-32.

25 (Exhibit 10 marked for identification.)

1 BY MR. HEALEY:

Q. Mr. Schneider, you are the person responsible
for response to OCC interrogatory 2-36 in the rate
case, correct?

5 A. Yes.

Q. I'm going to direct you to the second-to-last
7 sentence, starting with the word "without." It's about
8 five lines up. Do you see that?

9 A. Yes.

Q. Okay. So that sentence is, "Without waiving said objection to the extent discoverable and in the spirit of discovery, at the time of purchase, Duke Energy Ohio was aware that EDMS did have VEE functionality for interval AMI CEUD in a scalable manner." Do you see that?

- 16 A. Yes.
- 17 Q. SO EDMS itself is capable of VEE?

18 A. It had that capability, yes.

Q. When you say it had the capability, does thatmean that Duke's EDMS has the capability?

A. It has the capability to perform VEE at an interval usage level in a scalable manner. However, we realized that the cost to do that was going to be more than it would cost, because we were aware at the time of the second generation of MDM coming out. So it was

1 going to be more costly to manage and operate EDMS at a 2 scalable level for VEE for interval data than what it 3 was going to cost for us to convert to the new MDM 4 solution.

Q. So EDMS can perform VEE routines, but Dukedidn't purchase that functionality?

7 A. No. We did purchase that functionality.

8 Q. But you don't use it?

9 A. It would be more costly to use that. That's 10 why we don't perform VEE on interval data in a scalable 11 fashion. It was more cost efficient to convert to 12 MDM-2 to perform that.

Q. Now, we discussed before that the secondgeneration MDM became available around 2013, correct?

15 A. Correct.

16 Q. And when did Duke start using EDMS?

17 A. Prior to 2008 when I came onboard.

Q. And was that EDMS system performing VEE routines before you purchased the second generation MDM?

A. No, because -- well, we continued to perform it for some of our very large C and I customers that have interval meters, IDR meters which are meters that have been out there well ahead of AMI. So EDMS continues to perform VEE on interval data for those

meters. It's just when we started installing all the 1 Echelon meters that we realized what the cost would be 2 to continue to perform VEE functionality on the 3 interval data at that scale. 4 5 0. So let's talk about 2011, for example. In 2011, you had residential customers with Echelon 6 7 meters, correct? 8 Α. Correct. And in 2011, you did not have the second 9 0. 10 generation Oracle MDM, correct? 11 Α. Right. Q. For residential customers in 2011 with 12 13 Echelon meters, was EDMS performing VEE routines to create billing quality data? 14 15 Α. NO. 16 Q. Why not? 17 The CIS system was doing that. Α. 18 So in 2011 -- so the CIS system was producing 0. 19 billing quality data for Echelon customers with EDMS? 20 Not necessarily interval data, though. Α. 21 Okay. Can you explain to me what interval Ο. 22 data is in this context? 23 Interval data is the 15-minute interval of Α. 24 kilowatt hour usage in that interval. 25 Okay. So in 2011, an Echelon residential Q. CAIN & CRANE COURT REPORTERS 704/545.3510

1 customer was having VEE performed through the CIS but

2 only on a monthly basis?

3 A. Correct.

Q. And was it possible at that time to perform
VEE on interval data through EDMS or CIS?

6 A. It was possible through EDMS, like I said, at 7 an additional cost to go to the scale that we were at.

8 Q. And at the time in 2011, Duke did not incur 9 those costs?

10 A. That's right, because we were aware of a new 11 MDM that would be available that we could convert to or 12 transfer to in 2013.

Q. You were aware of MDM as far back as -- thesecond generation as far back as 2011?

A. I don't know if it was 2011 or early 2012.Somewhere in that timeframe.

Q. Okay. So what about the timeframe before you
were aware that there would be a second generation MDM,
were you performing VEE --

20 A. I don't recall --

Q. -- to produce interval billing quality datafor Echelon customers?

A. I don't recall the time when we, you know,
decided that it was going to cost more money. We did
it -- to my knowledge, we did it up to the point where

we could no longer do it without additional cost, and
 that's when we determined CIS would do the VEE
 validation for us.

Q. Do you need VEE validation on interval datato have a time of use rate?

6 A. Yes.

Q. So was it possible for a customer with an
Echelon meter to be on a time of use rate without
manually migrating to MDM?

10 A. No, it's not possible.

11 Q. Was it ever possible on Duke's system?

A. Using the EDMS? I don't know. I mean, it was probably possible until we got to the point where we were at a scale that it was going to cost more money to continue.

Q. When you refer to the cost of performing VEE through the EDMS and you state that the cost -- it would cost less using MDM; is that accurate?

19 A. Correct.

20 Q. Is that a one-time cost, or is it -- how are 21 those costs incurred, I guess is the question?

22 A. The cost to develop --

Q. The cost to develop a VEE capability.
A. Well, it was part of the second generation
MDM package.

Q. Okay. And you compared the cost of the
 second generation MDM to the cost of adding VEE
 functionality to EDMS?

4 A. VEE interval data --

5 Q. On interval data.

6 A. That functionality was there in the first 7 place. It's just that the cost to do it at the scale 8 we were going to was cost prohibitive in terms of 9 comparison to upgrading, if you will, to the gen. two 10 MDM.

11 Q. Okay. So when you say the cost of doing it 12 at the scale, what are those costs?

13 A. I don't know.

Q. I don't mean in terms of dollars. I'm just trying to understand. If I purchase a piece of software, I purchase it, I've paid for it, and then I use it. It doesn't cost me anything going forward. Is that what we're talking about with EDMS, or is there an ongoing cost of --

A. There's the ongoing cost and support of that, so you have to pay based on the volume that you're using.

Q. Okay. Thank you. That's what I was tryingto understand.

25 Let's come back to the exhibit, OCC

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interrogatory 2-36 from the rate case. The last sentence in your response is, "Duke Energy Ohio found that the cost and long-term support of that functionality was not optimal." Duke's finding there was not made at the time the original EDMS was purchased, correct? A. Correct.

8 Q. Did Duke evaluate the cost of having a third 9 party develop software to complete the VEE routines for 10 EDMS?

11 A. I don't know if we did or not.

Q. Under the current Echelon system, can Duke offer a peak time rebates program to residential customers?

15 A. No.

16 Q. Why not?

A. To my knowledge, that would require -- I'm
not an expert on the time of use rates, but to my
knowledge, that would likely require interval data.

20 Q. And when you say "interval data," you mean 21 billing quality interval data that's gone through VEE?

A. Yes, correct.

23 MR. HEALEY: I'm going to mark the next 24 exhibit. This is a tariff that Duke filed for peak 25 time rebates in the case 10-455-EL-ATA.

(Exhibit 11 marked for identification.) 1 2 BY MR. HEALEY: Mr. Schneider, can you turn to the second-to-3 Q. last page of this exhibit which is the Rider PTR tariff 4 5 sheet? Do you see that? 6 Rider PTR. Peak Time Rebate - Residential Α. 7 Pilot Program. The second sentence under "Availability" 8 Ο. says, "This rider is available only as company advanced 9 meters with interval recording registers are installed 10 on the customer's premises." Can you tell me what an 11 12 interval recording register is? 13 Α. That's basically an AMI meter. 14 Q. And so that at the time, since this was effective July 1, 2010, would have been an Echelon 15 16 meter? 17 2010? Yes. Α. Are you familiar with the term "home area 18 0. 19 network"? 20 A. Yes. 21 Can you tell me what a home area network is? Q. I would describe a home area network as 22 Α. 23 devices within the home, whether it's wi-fi or whatever 24 type of communications that the solution would have. 25 But a system that would provide customers with more
detailed information about their energy usage could 1 2 potentially be tied into smart appliances and other devices in their home. It's like their thermostats, 3 lights, other things that, you know, could be elaborate 4 5 enough to control devices in their home. 6 O. Can customers use a home area network with 7 Duke's node system? 8 To answer that question, I would say the Α. Echelon meters do not have a radio in them that would 9

10 be able to provide information back into the customer's 11 home or near realtime usage information.

Q. So it's a limitation in the Echelon meter that would prevent the use of a home area network under the node system?

A. Again, a home area network doesn't
necessarily mean you have to tie in --

Q. Sure. I'm talking about a home area networkthat connects to the metering system.

A. Correct.

Q. Is it possible to install such a radio in aEchelon meter?

A. Again, similar to my other responses, other
metering manufacturers do it. So is it possible? I
suppose it is.

25 Q. Did Duke know that Echelon did not have this

1 capability -- the Echelon meters did not have this

2 capability when it began installing them?

3 A. Yes.

Q. Why didn't Duke include a chip compliant with
Zigbee when it designed its initial Ohio metering
system?

A. At that time, there really wasn't a standard communications protocol for home area networks like Jigbee has kind of won out over the years, if you will, so there wasn't -- there just wasn't a single standard yet at that point that we would have felt confident with that would have talked to other devices in the home.

14 Q. Do the Itron meters have zigbee capability?15 A. Yes, they do.

16 Q. Are there alternatives to Zigbee that do the 17 same thing?

18 A. I'm not familiar with alternatives.

Q. Can customers use a home area network
connected to their electric metering system to save
money on their electric bills?

A. In what context? Are you asking me about a
particular solution or --

Q. I'm asking if you are aware of any uses for customers that are enabled by a home area network that

1 would allow them to reduce their usage.

2 A. To my knowledge, yes, there is.

3 Q. And what would those be?

A. Well, again, the Itron meters have the Zigbee functionality, and to my knowledge, there are home energy management systems that can tie with that Zigbee radio to display usage in -- again, however elaborate you want it to be, whether you want it to control your thermostat or other devices.

Q. Has Duke offered any home area network pilotprograms for its customers since 2010?

A. That wouldn't be my area of expertise, but tomy knowledge, I'm not aware of any.

Q. Do you know who would be the expert on that?
A. I don't know if it would be Sasha Weintraub.
Q. Does Duke currently have any programs that

17 target customer usage of electric vehicles?

18 A. I don't know.

19 Q. Do you know if Duke currently has any

20 residential energy efficiency programs that require an

- 21 AMI meter?
- A. I don't know.

Q. Do residential customers with Echelon metershave access to realtime data?

A. Can you define "realtime"?

Q. Well, let's start with, can residential 1 customers have access to data in 15-minute intervals as 2 3 it comes through? 4 Α. NO. 5 Q. Why not? 6 They have access to hourly interval data Α. 7 that's available to them the day following. So I use X number of kilowatt hours 8 0. throughout the day on Tuesday. On Wednesday I can see 9 by the hour how much I used each hour? 10 11 Α. Correct. Q. And that's only by the hour? 12 13 A. That's by the hour, yes. Have customers at any point since the 14 Q. 15 beginning of the Smart Grid requirement had access to anything more granular than hourly data the next day? 16 17 I do believe in Mr. Weintraub's testimony, he Α. 18 talks about a usage app that -- and I don't know where 19 they're at in the stage of piloting or developing that, 20 so I really can't answer. 21 Is the node system capable of providing real-Ο. 22 time data? 23 The only way a node system can provide Α. 24 realtime data is if we collected that -- well, we 25 already collect at 15 minutes on the meter, but we

would have to collect it from the node, have the node 1 collect it from the meter, and then the node send that 2 information back to us every 15 minutes which would be 3 a very high cost from a Verizon perspective on hauling 4 5 back that much data. 6 If the meter had the radio capability, would 0. 7 it be able to do it then? 8 The zigbee radio? Α. Uh-huh. 9 Q. 10 A. Yes. 11 Q. Can the mesh system provide realtime data to 12 customers? 13 Through the Zigbee, yes. Near realtime. Α. Ι don't know what we define "realtime." 14 15 MR. HEALEY: Let's mark the next exhibit. 16 This one is OCC interrogatory 08-174 in the rate case. 17 (Exhibit 12 marked for identification.) 18 BY MR. HEALEY: 19 Mr. Schneider, you are the person responsible 0. for the response to OCC interrogatory 08-174, correct? 20 21 Α. Correct. 22 Q. You state in response here, "when choosing an 23 AMI solution, Duke did not have requirements for 24 collecting usage data 'realtime'." Do you see that? 25 A. That's correct.

O. First question, when you say "when choosing 1 2 an AMI solution," what are you referring to? 3 well, both the -- to my knowledge, both the Α. original Echelon solution as well as the Itron 4 5 solution. 6 Q. You say that Duke did not have requirements 7 for collecting usage data realtime. What do you mean by "requirements"? 8 Specifications provided during the RFP 9 Α. process to collect data realtime. 10 11 Does Duke have these requirements now? Q. 12 Α. NO. 13 0. If the AMI transition is implemented as Duke proposes, will customers have access to realtime data? 14 15 Α. Via the Zigbee, yes. 16 Are vou familiar with Green Button? Q. 17 Vaguely. Α. 18 Can you tell me what Green Button is? Q. 19 To my understanding, there's two parts to Α. 20 Green Button. I think the first one was around 21 standardization in customer interval usage data to 22 provide to customers who could at that point provide to 23 third parties if they like. And then the other one I 24 believe is taking it to the next level of actually 25 connecting -- I think it's called Connect Green Button

1 where you can actually connect and get that

2 information.

Q. Is Duke's node system capable of using GreenButton?

A. Green Button, to my knowledge, is not really that dependent on the AMI vendor. As long as you're collecting the interval data and bringing it back into your meter data management system, it's from there that you would -- again, I'm not an expert on it, but I think it's from there that you would provide that interval usage data for Green Button.

Q. Does EDMS as Duke owns it have that capability to provide the data that would be necessary for Green Button?

A. Yeah, but it wouldn't be, you know, qualityinterval data.

Q. What about the mesh system, is that capable
of -- or let me go back. Is MDM capable of utilizing
Green Button?

20 A. MDM houses the interval data, and it is 21 quality data, so I suppose the answer is yes.

Q. Has Duke done any analysis of the cost andbenefits of implementing Green Button?

A. I haven't been involved.

25 Q. Does Duke currently offer any residential

1 demand response programs that rely on interval usage

2 data?

3 A. I do not know.

Q. Is it possible to offer a residential demandresponse program using the Echelon system?

A. I don't know what the requirements are for ademand response system to be able to answer that.

8 Q. Does Duke currently offer any prepay service9 to residential customers?

A. To my knowledge, we are piloting it currently
in South Carolina, Duke Energy Carolinas - South
Carolina.

Q. And in that pilot, is that being done withItron meters?

15 A. Yes.

16 Q. Is it possible to offer prepay under the node 17 system?

A. Again, I don't know enough about the prepay
solution to know if it is or not. That would be a
question for Sasha Weintraub.

Q. We mentioned before the Mediview assessment that was done in PUCO Case Number 10-2326. Do you know what I'm talking about if I refer to the Mediview report?

25 A. Yes.

1 Q. And you're aware that in that docket, Duke 2 signed a stipulation which was later approved? 3 A. Yes. MR. HEALEY: I'm going to mark the next 4 5 exhibit which is the stipulation and recommendation filed in PUCO Case Number 10-2326-GE-RER filed on 6 7 February 24, 2012. (Exhibit 13 marked for identification.) 8 BY MR. HEALEY: 9 10 Mr. Schneider, you've seen this document **0**. 11 before? A. It's been a while, but, yes. 12 13 Q. Can you turn to page seven, please? On page seven, there's a subsection D, and on the third line 14 15 under D, the first complete sentence starts, "The test 16 year used in the base rate application shall begin no 17 earlier than the date of full deployment such that the 18 revenue requirement requested in that case will reflect the level of the benefits attributable to Smart Grid 19 20 which have actually been achieved by the company and 21 all prudently incurred current costs associated with 22 the program." Do you see that? 23 Α. Yes. 24 what are the actual test year benefits to 0.

25 customers that are attributable to Smart Grid?

I can't answer that. That would be probably 1 Α. 2 for Witness Wathen or Laub. 3 Can you turn to page 11 of the 10-2326 Q. stipulation, please? Subsection C states, "The company 4 5 will provide CRES providers the necessary billing 6 system functionality to offer CRES customers time differentiated rates consistent with its existing 7 supplier tariff beginning January 1, 2013." 8 9 Did Duke in fact begin offering that functionality to CRES providers on or before January 1, 10 11 2013? That would be a question for Witness 12 Α. 13 Nicholson. Q. Do you know the answer? 14 15 A. I do not. Q. Do you know if Duke offers that functionality 16 17 to CRES providers now? 18 Α. I do not. 19 Q. Would that also be a question for 20 Mr. Nicholson? 21 Yes, it would. Α. 22 Can you turn to page 17 of the 10-2326 Q. 23 stipulation, please? The last sentence under 24 subsection B states, "Duke Energy Ohio will meet with 25 Commission Staff and interested parties semi-annually

through 2014 to review results." Do you see that? 1 2 A. Yes. Do you know if Duke in fact had those 3 Ο. meetings with the PUCO staff? 4 5 Α. I do know that Duke met with several parties through a collaborative effort that started I think 6 7 back in 2008 and went through 2015, if my memory is correct, but I don't know any details of that. I 8 9 wasn't involved. 10 Do you know who was involved? Q. I believe Jeff Duff is the only name that 11 Α. 12 rings a bell. It's not Jeff Duff. I'm sorry. 13 Q. Tim Duff? 14 A. Tim Duff, yeah. I assume, then, that you don't know what was 15 Q. 16 discussed at these meetings between Duke and the 17 commission staff? 18 Α. NO. Has the node system reduced Duke's operations 19 0. 20 and maintenance costs? 21 Α. Yes. Q. How much has that reduction been per year? 22 23 I don't have that number offhand. Α. 24 Q. Will the mesh system further reduce O and M 25 costs beyond any improvements already made by the node

1 system?

2 A. Yes. Did Duke do any analysis of the amount of the 3 Q. additional reduction in O and M costs as a result of 4 5 transitioning to a mesh environment? 6 Α. NO. 7 You state that the mesh system will in fact 0. reduce O and M costs. What O and M costs will it 8 9 reduce as compared to the current node system? It's just a matter of operating and 10 Α. maintaining -- I think we're up close to 1,400 CGRs 11 12 versus operating and maintaining 144,000 nodes. 13 Q. what type of costs go into maintaining these CGRs and nodes? 14 15 There's system monitoring costs, so we have Α. an AMI operations center that monitors the operations 16 17 of those devices, and then obviously the field costs 18 associated with removal and replacement and repair 19 costs. 20 would those costs that you just discussed be Q. 21 reflected in your Attachment DLS-1? 22 No, they are not. Α. 23 They are not reflected for either the node Q. 24 environment or the mesh environment? 25 No, because those are savings. Again, this Α.

analysis was just looking at reviewing the cost to
 continue the node environment versus the cost to
 convert to a mesh environment.

Q. Does Duke's Echelon metering system improvereliability for customers?

6 Α. To the extent that we can interrogate those 7 meters, so that helps us in terms of reducing truck 8 rolls on single-customer outages. So we can interrogate the meter to see if they're really out 9 rather than roll on a truck. And then on storm 10 situations as well, there's opportunities that 11 12 interrogating the meter allows us to, number one, 13 reduce our expenses for storm costs.

Q. Will the mesh system further improve the reliability of Duke's system as compared to the node system?

17 A. It will basically have the same.

Q. So you would expect the reliability to be comparable with the mesh system as compared to the node system?

21 A. Yes.

Q. And when you were discussing -- I know we're
using the word "reliability," and that was my word.
Are we talking about a safety score or something else?
A. Yes, it could relate to safety in terms of --

and probably more SAIDI which is duration of outage. 1 2 Q. Are you familiar with the American Recovery and Reinvestment Act of 2009, sometimes known as ARRA, 3 A-R-R-A? 4 5 A. Yes. 6 Are you aware that one of the programs under Q. 7 ARRA was the Smart Grid Investment Grant Program? 8 Α. Yes. And you're aware that Duke filed an 9 0. 10 application for a Smart Grid Investment Grant in 2009, 11 correct? 12 Α. Correct. 13 Q. Did you assist in preparing that application? I provided some input, but I was not --14 Α. 15 didn't have responsibilities for providing that grant application. 16 17 what type of input did you provide? Q. Cost information around Smart Grid 18 Α. 19 applications. 20 When you say "cost information," are you Q. 21 talking about the cost of meters, the cost of --22 A. Yes. 23 Q. -- nodes? 24 A. Correct. 25 Anything else? Q.

Probably at the time, some of the 1 Α. 2 distribution automation stuff, as well. And you're talking about the cost of those? 3 Q. A. Cost of those. 4 5 Q. Did you provide any other input in that application other than cost information? 6 Not that I recall. 7 Α. Q. Who else at Duke was involved in that 8 9 application? 10 Kevin Spainhour. Α. 11 Q. Anyone else? 12 A. He was the main one that I worked with. 13 MR. HEALEY: I'm going to mark another exhibit. This exhibit is a copy of Duke's Smart Grid 14 15 Investment Grant application. I apologize for the 16 length. 17 (Exhibit 14 marked for identification.) 18 BY MR. HEALEY: Mr. Schneider, do you recognize this as 19 0. 20 Duke's Smart Grid Investment Grant application to the 21 U.S. Department of Energy? 22 I have never actually seen the actual grant Α. 23 application. It's the first time. 24 I'll note just for purposes of the record 0. 25 that at the very bottom, there is a number on the first

1 page, 00000136 --

2 Α. Yes. 3 -- and it goes all the way through 211. Ο. Those are Bates stamp numbers that OCC added just for 4 5 purposes of referencing this document. So those are 6 not part of the original document, just so you are 7 aware, but it makes it easier for us to talk about it. 8 Α. Okav. Can you turn to page two of this exhibit, the 9 0. 10 Smart Grid Investment Grant application? 11 we're not going page by page, are we? Α. No, we are not. We are not going to do that. 12 0. 13 You'll see near the bottom there's identified as a contact person Jeff Gates. Do you know who that is? 14 15 I do not. Α. 16 Q. Can you turn to page 49, please? Page 49, 17 there is an Exhibit 2-1 which is marked as "Duke Energy Smart Grid Architecture." Do you see that? 18 19 Α. Yes. 20 Did you create this diagram? Q. 21 Α. I did not. 22 Do you know who did? Ο. 23 A. I do not. 24 Does this diagram portray Duke's current node Q. 25 metering system?

A. Yes, as far as the end devices in that first 1 2 block, if you will. 3 Q. Uh-huh. And does this diagram show Duke's proposed mesh system at all? 4 5 A. No, it does not. Q. Can you turn to page 55, please? There's an 6 Exhibit 3-1, "Smart Grid PMO." Do you see the bubble 7 near the right side that says, "Don Schneider, Field 8 9 Deployment, Power Delivery"? 10 A. Yes. I apologize for the stupidity of this 11 Q. 12 question, but that's you, correct? 13 A. Correct. Q. And what does "field deployment, power 14 delivery" mean? 15 Power delivery was our transmission and 16 Α. 17 distribution operations organization that I worked in 18 at the time, again, where I had responsibilities for managing the field execution of the Smart Grid 19 20 deployments that we had active at the time. 21 And there's a line down from your name to a Q. 22 Tony Adcock. Do you see that? 23 Yes. Α. 24 O. Who is he? 25 A. At the time, he was managing the distribution

automation portion of the Smart Grid. 1 2 And does he still work for Duke? Ο. A. He still does, but not in that role. 3 Let's turn to page 57, please. There is 4 Q. 5 reference here under Section 3.3 to a Smart Grid design 6 basis document. Do you see that? 7 Α. Yes. 8 Do you know what that document is? Q. 9 Α. I vaguely recall it, yes. 10 Have you seen it before? Q. 11 Years ago, yes. Α. Do you have a copy of it with you? 12 **Q**. 13 Α. I do not. 14 Do you have a copy of it available to you at Q. 15 Duke? 16 Α. I do not. 17 Q. Can you turn to page 64, please? The last 18 sentence in that first partial paragraph on page 64 19 reads, "If major changes in metering or distribution 20 automation hardware are required, replacement of a 21 single removable data card will fully change the 22 operating protocols without replacing the physical 23 devices." 24 Does your AMI transition plan propose 25 replacement of a single removable data card as opposed

to replacing physical devices? 1 2 I'm not sure what's meant by a data card. Α. Do you know what "operating protocols" means 3 Q. in that sentence? 4 5 Α. Not in the context of this sentence, no, 6 because, again, I don't know what a data card is 7 referencing there. 8 Okay. Can you turn to page 76, please? Q. There's a heading near the top, "Duke Energy's Smart 9 Grid Vision." Do you see that? 10 11 A. Yes. Q. And the second sentence says, "Since 2006, 12 13 Duke Energy has led the industry in the execution of the smart grid strategy where the network is the 14 15 foundation." Do you see that sentence? A. Yes, I do. 16 17 Q. This references the year 2006. What was Duke 18 doing with respect to smart grid in 2006? I do not know. I didn't come into that group 19 Α. until September of 2008. 20 21 Q. And when you came into that group in 22 September of 2008, what was Duke doing with respect to 23 smart grid at that time? 24 A. As I mentioned earlier, I came in to manage 25 the deployment of the AMI solution in Ohio as well as

the distribution automation efforts that were part of
 smart grid, so I don't know what was going on beyond
 that.

Q. When Duke began installing the Echelon meter
as part of its market initiative, were those the first
smart meters installed for residential customers in
Duke Energy Ohio's service territory?

8 A. Yes.

9 Q. Can you turn to page 157 of the Smart Grid 10 Investment Grant exhibit, please? You'll see there's a 11 letter here. It says "Square D" at the top, and then 12 "by Schneider Electric."

13 A. Yeah, and the Schneider is not me.

14 Q. Okay. That's my only question on this one, 15 so --

16 A. Okay. I wish it was.

Q. Do you know what communications Duke has had with the U.S. Department of Energy regarding its Smart Grid Investment Grant?

A. Not outside of the grant application itself,no.

Q. Have you been involved in any reports or
updates to the U.S. Department of Energy on behalf of
Duke?

A. I did travel to Washington, D.C., for some

sort of meeting with the DOE. Oh, gosh, that would
 have been back in 2009 or so, and I can't even recall
 what it was about.

Q. Is that the last time that you personally had
any contact with the U.S. DOE regarding your Smart Grid
Investment Grant?

A. We provided annual updates to them on our
smart grid deployment in Ohio. They came on site
annually for us to perform updates. I was involved in
those.

11 Q. You were involved?

12 A. I was, yes.

Q. And what was your role in those onsitevisits?

A. Providing a deployment update for the AMI andthe distribution automation in Ohio.

Q. Was DOE doing any kind of physical inspectionof Duke's deployment?

A. Yes, we did take them out to the field. I
don't know if it was considered an inspection or not,
but we did go out in the field on one visit.

Q. Do you continue to have those meetings withthe U.S. DOE?

24 A. No.

25 Q. When did they stop?

1 A. I don't recall.

2 Did Duke disclose to the U.S. Department of Q. 3 Energy its decision to start using a mesh system in addition to a node system? 4 5 A. Not to my knowledge. 6 MR. HEALEY: At this point, I'm going to ask 7 to take a five'ish-minute break, if that's okay. Τ think I'm done, but I'm going to talk to Jim in 8 private, if that's okay with you guys, and then come 9 10 back and then move on. 11 (Recess.) 12 BY MR. HEALEY: 13 Q. Mr. Schneider, we discussed earlier Ericsson's repairs of failing nodes. Do you recall 14 15 that? 16 Α. Yes. 17 Have there been instances of nodes that were Q. 18 repaired by Ericsson that then failed again? 19 I don't know. Α. Do you know if Duke did any analysis of the 20 0. 21 success of Ericsson's repairs and whether or not the 22 repaired nodes tend to fail at a higher rate than other 23 nodes? 24 No, not to my knowledge. Α. 25 Q. You discussed before in the context of your

Attachment DLS-1 that you did a 20-year NPV analysis,
 because that was Duke's standard assumption, correct?
 A. Yes.

Q. And you're aware that when Duke was initially seeking approval from PUCO of its smart grid plan, it had a 20-year business case, correct?

A. I wasn't involved in that. I don't know.
Q. Do you know if Duke has done any analysis to
9 determine whether -- sorry -- to determine the costs
10 that would be necessary to deliver a system that was
11 consistent with its original cost/benefit analysis?

12 A. That would be the continue node environment13 costs.

Q. So is it your understanding, then, that this continue node environment, those costs in your Attachment DLS-1 were also included as costs in the original business case?

18 A. Again, I wasn't involved in the original19 business case, so I can't answer that question.

Q. I would like to return briefly to the peak
time rebates exhibit from earlier. Just let me know
when you found it.

23 A. Okay.

Q. Now, we discussed earlier this peak time
rebate pilot program according to this tariff sheet was

effective July 1, 2010, correct? Do you see that at
 the bottom? I'm sorry, we're on the second-to-last
 page of the exhibit.

4 A. Effective July 1, 2010.

Q. And in July of 2010, had Duke alreadypurchased the second generation MDM?

7 A. No.

Q. And correct me if I'm wrong, but I believe you testified earlier that for a peak time rebate program, you would need billing quality interval data, correct?

12 A. Correct.

Q. And can you walk me through how Duke produced billing quality interval data in 2010 without the second generation MDM?

A. I'm not sure how we -- I don't even know if we had any customers on this rate that early. I'm not sure when the first customers came on to this rate to know if we were performing that out of EDMS.

20 Q. So your answer is just that you're not sure 21 how billing quality interval data was produced in July 22 2010?

A. It would have had to have been done out ofthe EDMS if it was done.

25 Q. And I believe we discussed earlier that in

the EDMS system, the data goes into CIS for the VEE
 routines which are not interval routines, correct?

3 A. Correct.

Q. And that the EDMS itself does not provide VEE
routines that produce interval billing quality data,
correct?

7 A. well, as I mentioned earlier, it does for the larger C and I customers that were not changing their 8 9 meters out, so they have the IDR interval meters that 10 they've had for years. So those customers continue to have their interval data VEE validated in EDMS. So my 11 12 quess is, if we had customers on this program before we 13 went to the MDM generation two, we handpicked those 14 customers to make sure they went through the VEE 15 validation for their interval data.

16 MR. HEALEY: That's all I have. At this 17 point, I know Joe at IGS said he might have some 18 questions. I don't know think anybody else said they 19 did, but they're welcome to.

Joe, do you want to go first, and then anybody else that has questions can jump in, or do you need a few minutes?

23 MR. OLIKER: That sounds good to me, because 24 I'm already late for another call, so I'll try to keep 25 it quick.

1	EXAMINATION
2	BY MR. OLIKER:
3	Q. Good afternoon, Mr. Schneider. My name is
4	Joe Oliker, and I'm with IGS Energy. I have just a few
5	questions for you.
6	A. Okay.
7	Q. Going back to I think a subject that you
8	touched on earlier. Can you talk about what is known
9	as validation error detection and editing or VEE?
10	A. Yeah, it's validation, editing, and
11	estimation.
12	Q. Okay. Does the term "validation error
13	detection and editing" have any meaning to you?
14	A. NO.
15	Q. Okay. And what about "raw meter data," does
16	that have any meaning to you?
17	A. I don't know that I've ever heard that term.
18	I can only assume it means, as it says, the raw data,
19	the interval usage data in a raw format, I suppose.
20	Q. So am I correct that first a meter produces
21	data, and then it has to go through an additional
22	process before it can be bill quality?
23	A. Correct.
24	Q. Earlier you gave a definition of validation,
25	editing, and estimation. Could you repeat that

1 terminology again please?

2 A. Yes. So the acronym is VEE, common in the utility industry. So it's a practice that takes place 3 to look at the data that you've collected for that 4 5 meter. I mean, it happens even on monthly meter reads just to look back at the past month's reads, compare 6 7 it. Does it look like it's a good number? Is it out of whack? Maybe the meter reader read it wrong. 8 SO 9 that's some of the validation. And then if it's not complete data, then it becomes estimated and then 10 11 edited.

Q. Okay. And would you agree that if data has
not gone through the VEE process, it would not have any
value to a CRES provider for purposes of billing?
A. For purposes of billing, that would seem to

16 be correct, yes.

Q. Okay. Staying on this topic, for purposes of doing VEE, that has to be done for both a residential customer and a commercial customer, correct?

A. In order to have bill quality interval data,yes.

Q. Okay. Are you familiar with the process of a CRES provider requesting historical usage data for a customer with an interval data recorder or what is known as an IDR?

Just vaguely. I think Witness Nicholson is 1 Α. 2 the expert in that area. Q. That was my next question. What is your 3 level of familiarity? 4 5 I'm just familiar that they have the Α. capability to capture that data on I believe a CRES 6 supplier website, if I'm not mistaken. 7 Are you familiar with any of Duke Energy 8 0. 9 Ohio's costs for purposes of providing that service? 10 A. No, I'm not. O. And what witness would be more familiar with 11 12 those costs? 13 Α. Witness Nicholson. Q. Okay. Switching gears, you talked earlier 14 15 about 2022 and Verizon, and I'm just very high level 16 paraphrasing. Do you remember that discussion? 17 A. Yes. I do. 18 And am I correct that additional upgrades 0. have to be done prior to 2022 to the current meters? 19 20 A. To the communication nodes and CGRs that are 21 2G or 3G. 22 Okay. And then am I correct you described Q. 23 that that process involves soldering of those nodes? 24 Α. That's correct. 25 Q. And I was having trouble understanding

earlier in your discussion. Is it feasible to replace
 those nodes through soldering?

A. I suppose it is. I don't know for sure. I just understand that it would, you know, require to take that chip out of a soldered board and replace it. You know, whether they redesigned it with a plug-andplay-type modem to take its place, I don't know those details.

9 Q. And am I correct Duke has not evaluated that 10 cost?

A. Well, again, some of the nodes that we've sent back to Ericsson for repair, they are retrofitting them with a 4G modem. I'm just not familiar with the details of how they're doing that. And so there is a cost associated with it. I don't know what that cost is.

Q. Okay. And to the extent there is no soldering of new nodes onto the existing AMI equipment, what happens in 2022?

A. I don't follow your question. I'm sorry.
Q. What would happen if Duke did not upgrade its
existing nodes in 2022? Would those AMI meters cease
to function?

A. Well, from a metrology perspective, theywould continue to meter the usage, but it would not be

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able to send that data back to Duke for billing
 purposes.

Q. And what would Duke have to do to get thatbilling information?

5 We would have to walk by and read the meters, Α. 6 and then we would have to spend extra time at each 7 meter to download the interval data as opposed to just getting the register read, you know, if we wanted to 8 9 continue to provide the usage information to the 10 I mean, we could revert back to billing customers. just off of the register read and just get the register 11 12 read, but if we wanted to continue to provide the 13 service of providing customers with the interval usage 14 data on the website, then we would have to spend extra 15 time at each meter to download that data each month. 16 And then the customers wouldn't have it until -- they 17 would only have that data on a monthly basis instead of 18 a daily basis.

Q. Okay. So it sounds like to summarize that,
if nothing is done to upgrade the nodes, come 2022, the
AMI meters act like the old meters that simply turned?

A. That's right. And then we would also lose the functionality of being able to remotely connect and disconnect those meters, so we would have to go back to rolling trucks for all of those requests.

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Q. Okay. Switching gears to a different 1 2 subject, there was some discussion of time-of-use-type 3 products. Do you remember that discussion? Α. I believe so. 4 Are you involved at any level in the creation 5 Q. 6 of those time of use products? 7 A. No, I'm not. 8 Q. Okay. And what was the witness you identified would be better to speak to regarding that 9 10 subject? Regarding time of use rates -- if you guys 11 Α. 12 can help me. The witness' name is escaping me right 13 now. I can't recall who the witness is in this case on the time of use rates. 14 15 Q. That's okay. 16 MR. HEALEY: It's probably the one that said things about time of use rates in the testimony. 17 THE WITNESS: Yes, that's who that would be. 18 19 There's too many witnesses in this case. 20 MR. OLIKER: Okay. Give me one second. I 21 think those are all of the questions that I have. 22 Thank you, Mr. Schneider. 23 THE WITNESS: Thank you. 24 MR. HEALEY: This is Chris again. Does 25 anybody else on the line have any questions?

1	MS. BOJKO: This is Kim Bojko. I have a
2	couple of questions.
3	MR. HEALEY: You're up.
4	EXAMINATION
5	BY MS. BOJKO:
6	Q. Good afternoon, Mr. Schneider.
7	A. Good afternoon.
8	Q. You stated earlier that your testimony
9	between the rate case and the ESP cases were
10	substantially similar, and if I look at page 17 of the
11	ESP case I'm sorry, page 17 of the rate case and 15
12	of the ESP testimony, there's a discussion there about
13	AMI transition. Do you see that?
14	A. So did you say page 15 of the ESP testimony?
15	Q. Yes.
16	A. Yeah, I don't have the rate case testimony in
17	front of me.
18	Q. Okay. So we can use the ESP. You would
19	agree with me that your testimony is substantially
20	similar on this issue?
21	A. I do agree, yes.
22	Q. So if you look at page 15, there's a
23	reference to Ohio AMI transition and the cost of
24	approximately \$143.4 million. Do you see that?
25	A. Yes, I do.

Is the transition that you're referring to in 1 Q. this section mainly for residential meters? 2 3 Α. Yes, it is. Q. Of the \$143.4 million capital cost that you 4 5 reference, would this cost mostly benefit the residential customers? 6 7 Α. Yes. 8 And do you know in the company's application Q. 9 who Duke is asking to pay the \$143.4 million? I do not. That's not my area of expertise. 10 Α. 11 Do you know in which component of the rates Q. 12 that this charge would be collected or cost would be 13 collected? Again, that's not my area. 14 Α. Okav. Who would know that? 15 Q. 16 I suppose it would be either Witness Laub or Α. 17 wathen. 18 Q. And can you explain to me why you have explained the cost of the proposed AMI transition in 19 20 both the rate cases and the ESP case? 21 I think we just wanted to make sure that it Α. 22 was discussed in both of those dockets. 23 And by the way you responded to a prior Q. 24 question, you can't speak to which case Duke is 25 actually requesting to seek the cost recovery that you

refer to, the \$143.4 million for the transition. Is that fair? A. Again, yeah, that's not my area. I think that would be Don Wathen's. MS. BOJKO: Okay. Thank you so much. That's all I have. THE WITNESS: Okay. Thank you. MR. HEALEY: Anybody else? Okay. That's the end of Mr. Schneider's deposition. Thank you, Mr. Schneider, for your time. It's much appreciated. (whereupon, at 3:19 p.m., the taking of the deposition ceased. Signature was reserved.) 

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43	014.400./904		
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43010	626,000		
4:15	23:2		
43212	<b>64</b>		
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43215-3485	6.15 71.17		
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46	58.7 10		
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48,800	70 6:12		
91:12 92:16 93:7	0.13 71		
49	/1		
124:16,16	0.13		
4901-1-21(B)	13		
8:4	50.4 76		
4928.143	10		
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Post Office Box 23833 Charlotte, North Carolina 28227 Phone (704) 545-3510 Fax (704) 545-3950 Email: depos@cainandcrane.com www.cainandcrane.com

January 12, 2018

Christopher Healey, Esquire Office of Ohio Consumers' Counsel 10 West Broad Street, Suite 1800 Columbus, Ohio 43215

Dear Mr. Healey:

The transcript of the December 6, 2017, deposition of Donald L. Schneider, Jr., in the Duke Energy Matter has been read and signed.

Please let me know in writing within ten days if you wish for me to retain the audio record to verify any corrections that were made.

The original amendment and signature pages have been inserted within the original transcript, and this transcript is enclosed for your use in this matter.

Copies of the amendment page and signature page are being provided to Ms. Elizabeth H. Watts. Attached are copies of these pages for you to associate with your copy of the transcript.

If there are any questions, please feel free to call me at (704) 545-3510.

Sincerely,

inda D. Crane

Linda D. Crane, RMR/CRR

cc: Elizabeth H. Watts, Esquire

Attachments

LIST PLEASE DO NOT WRITE WITHIN THE TRANSCRIPT ITSELF. ANY CORRECTIONS BY PAGE AND LINE NUMBER ON THIS SHEET. IF ADDITIONAL PAGES ARE NECESSARY, PLEASE FURNISH SAME AND ATTACH THEM TO THIS AMENDMENT PAGE. YOU ARE ALLOWED 30 DAYS WITHIN WHICH TO COMPLETE THE SIGNATURE PAGE AND AMENDMENT PAGE. AFTER COMPLETING THESE PAGES, PLEASE RETURN THEM TO CAIN & CRANE COURT REPORTERS, POST OFFICE BOX 23833, CHARLOTTE, NC 28227.

DEPOSITION OF: Donald L. Schneider, Jr.

I, Donald L. Schneider, Jr., certify that I have read my deposition, which was taken on December 6, 2017, and request that the following changes, if any, be made:

Page 36 Line 17 & 20 Change should be MetaVu 10

	Reason IC	r change		
12		-		
13	Page 37 Li	nel	Change	should be MetaVu
14	Peason fo	r change		· · · · · · · · · · · · · · · · · · ·
15	Keason ro	r change	en de <sup>g</sup> en voer anna anna an	
16	Page 38	Line 10	Change	should read "that are o

оп 17

Reason for change 18

Page 96-97 Line 10 \$5 Change in my responses, I should 19 have noted that Networked Energy 20 Services Corporation purchased Reason for change Echelon in 2014 and they are the 21 ones that continue to manufacture the meters now, not Echelon

Page 116 Line 21 & 23 23

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Change should be MetaVu

Reason for change

Schneider,

CAIN & CRANE COURT REPORTERS 704/545.3510

1/9/18

## AMENDMENT PAGE

PLEASE DO NOT WRITE WITHIN THE TRANSCRIPT ITSELF. LIST 2 ANY CORRECTIONS BY PAGE AND LINE NUMBER ON THIS SHEET. IF ADDITIONAL PAGES ARE NECESSARY, PLEASE FURNISH SAME 3 AND ATTACH THEM TO THIS AMENDMENT PAGE. YOU ARE ALLOWED 30 DAYS WITHIN WHICH TO COMPLETE THE SIGNATURE PAGE AND AMENDMENT PAGE. AFTER COMPLETING THESE PAGES, PLEASE RETURN THEM TO CAIN & CRANE COURT REPORTERS, POST OFFICE BOX 23833, CHARLOTTE, NC 28227. DEPOSITION OF: Donald L. Schneider, Jr. I, Donald L. Schneider, Jr., certify that I have

read my deposition, which was taken on December 6, 8 2017, and request that the following changes, if any, 9 be made: Page 121 Line 24 & 25 Change the word "safety" should 10 be "SAIFI" 11 Reason for change 12 Page 133 Line 8 Change the word "were" should 13 be "weire" 14 Reason for change 15 Page Line Change 16 17 Reason for change 18 Page Line Change 19

20 Reason for change 21 Page Line Change \_\_\_\_\_ 22 23

Reason for change

25

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CAIN & CRANE COURT REPORTERS 704/545.3510

Donald L.

1/9/18

Jr.//

Schneider.

1	SIGNATURE PAGE
2	
3	DEPOSITION OF: Donald L. Schneider, Jr.
4	I, Donald L. Schneider, Jr., do hereby certify
5	that I have read the foregoing deposition and that the
6	foregoing transcript is a true and correct record of my
7	testimony, subject to the attached changes, if any, on
8	the amendment page.
9	
10	
11	
12	Daviel Slong
13	Donald L. Schneider, Jr.
14	
15	Subscribed and sworn to before me this day
16	of 2018.
17	
18	Sheela Lemoine
19	Notary Public
20	
21	My Commission expires: Shella Lemone Notary Public
22	Meckanitati Contry North Carolina My Commission Expires 7/2/2019
23	

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in

Case No(s). 17-0032-EL-AIR, 17-0033-EL-ATA, 17-0034-EL-AAM, 17-1263-EL-SSO, 17-1264-EL-ATA, 2

Summary: Deposition Deposition Transcript of Donald Schneider filed on Behalf of the Office of the Ohio Consumers' Counsel electronically filed by Ms. Deb J. Bingham on behalf of Healey, Christopher Mr.