

BRITISH COLUMBIA UTILITIES COMMISSION
IN THE MATTER OF THE UTILITIES COMMISSION ACT
R.S.B.C. 1996, CHAPTER 473

And

Re: FortisBC Energy Inc.
Application for a Certificate of Public Convenience and
Necessity for the Advanced Metering Infrastructure Project

Kelowna, B.C.
March 8, 2013

PROCEEDINGS

BEFORE:

L. Kelsey,	Commission Chair / Panel Chair
N. MacMurchy,	Panel Member
D. Morton,	Panel Member

VOLUME 6

ERRATA

Volume 5, March 7, 2013

All "MR. ATAMANENKO" should be "MR. ATAMENENKO"

All "Mr. Atamanenko" should be "Mr. Atamenenko"

APPEARANCES

G.A. FULTON, Q.C.	Commission Counsel
G.K. MACINTOSH, Q.C. and L.. HERBST	FortisBC Inc.
I. WEBB and C. FOLKESTAD	British Columbia Hydro and Power Authority
C. WEAVER	British Columbia Municipal Electric Utilities and Commercial Energy Consumers Association of British Columbia
E. KUNG and T. BRAITHWAITE	B.C. Pensioner and Senior's Organization, BC Coalition of People with Disabilities, Counsel of Senior Citizens' Organizations and the Tenant Resource and Advisory Centre
W. ANDREWS	B.C. Sustainable Energy Association and Sierra Club of British Columbia
D.M. AARON	Citizens for Safe Technology
C. BENNETT	West Kootenay Concerned Citizens
A. ATAMENENKO	Riding of B.C. Southern Interior
A. SHADRACK	Electoral Area D, Regional District, Central Kootenay
J. FLYNN	On his own Behalf
K. MILES	On his own Behalf

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CAARS

KELOWNA, B.C.

MARCH 8, 2013

(PROCEEDINGS RESUMED AT 8:29 A.M.)

THE CHAIRPERSON: Please be seated.

FORTIS PANEL 2 - HEALTH AND ENVIRONMENT

TOM LOSKI, Resumed:

MARK RICHARD WARREN, Resumed:

WILLIAM HAYES BAILEY, Resumed:

YAKOV SHKOLNIKOV, Resumed:

THE CHAIRPERSON: Good morning, everyone. Welcome to Friday morning. I think we're in the home stretch for the week. Mr. Fulton.

MR. FULTON: Good morning, Mr. Chairman.

THE CHAIRPERSON: Good morning.

MR. FULTON: Good morning, Commissioners. I have a brief report to make on the video conferencing review last night. The review was short-circuited because it became apparent rather quickly that the person on the other end of the video link was Dr. Sears. Given that Mr. Aaron was not in the room, all the lawyers decided that they should not be there as well. So we left the room and left Dr. Sears to Mr. Bemister. And so, I am going to suggest that we try again on Monday afternoon, but this time use someone from Mr. Bemister's office.

1 THE CHAIRPERSON: I hope that Dr. Sears didn't take that
2 personally, the fact that when -- as soon as she
5 appeared, everybody ran for the hills.

4 MR. FULTON: Yes. So with that brief introduction, Mr.
5 Chairman, I'm going to turn the mike back to Mr.
6 Atamenenko.

7 THE CHAIRPERSON: Okay, thank you. Is Mr. Aaron here
8 this morning?

9 UNIDENTIFIED FEMALE VOICE: Yes, he is. He's on the
10 road.

11 THE CHAIRPERSON: Thank you.

12 MR. ATAMENENKO: Well, thank you very much.

13 THE CHAIRPERSON: Good morning.

14 MR. ATAMENENKO: Q: Good morning. Thank you very much,
15 Mr. Fulton. Good morning.

16 **CROSS-EXAMINATION BY MR. ATAMENENKO (Continued):**

17 MR. ATAMENENKO: Q: I'd just like to continue by
18 pursuing the question I had yesterday for Dr. Bailey.
19 Yesterday, Dr. Bailey, I asked you if you agreed with
20 Dr. Hyland when he described the human body as an
21 electrochemical instrument of exquisite sensitivity,
22 and that like a radio it can be interfered with by
23 incoming radiation.

24 In your response, you agreed to the first
25 part, that the human body, the nervous system, is an
26 electrochemical system by which cells communicate with

1 one another, and by both electrical and chemical
2 signals. You went on to say that Dr. Hyland presumes
5 in the second part of his statement, I quote, "that
4 the external fields or stimuli are sufficient to
5 interfere with the electrochemical system to a point
6 where some health effect or harm occurs and certainly
7 at very high levels of exposures that occur."

8 I would just like to point out here that
9 for the way I read it, Dr. Hyland does not in that
10 statement allude to any harmful effects. What I would
11 like to establish from you is whether, like a radio,
12 the human electrochemical system can be interfered
13 with by incoming radiation, whether good or bad or not
14 at all.

15 DR. BAILEY: A: There can be interference with the
16 electrochemical system at sufficiently high exposures.

17 MR. ATAMENENKO: Q: So is there a level that the human
18 electrochemical system does not interact in any way
19 with other electrical or incoming radiation? And at
20 what level is there no electrical effect or
21 interaction? There's a difference here.

22 DR. BAILEY: A: I think the way that scientists look at
23 it is to keep testing at various levels and at some
24 point we determine that there is a threshold below
25 which we cannot reliably detect effects if they exist.

26 MR. ATAMENENKO: Q: So there is a threshold and there

1 is no level where they will not interact with each
2 other.

5 DR. BAILEY: A: In terms of biological effects, the
4 research tells us that as you get lower and lower at
5 some point it is impossible to reliably determine
6 whether there is a response or not.

7 **Proceeding Time 8:34 a.m. T2**

8 MR. ATAMENENKO: Q: Okay, thank you. I'll move on.

9 Yesterday I mentioned certain policies in
10 other jurisdictions. We see -- I'd just like to
11 highlight a few more. We see there's certain -- we
12 see precautionary approaches from other countries, for
13 example such as France, which has banned the marketing
14 of cell phones to children under 14. We see the
15 Public Health Commission of Salzburg, Austria which
16 has recommended that schools not use wireless.
17 There's actually a school in my area, New Denver, that
18 has said we're not going to have wireless technology
19 in our school. So we have people in our country too
20 that are using the precautionary approach.

21 We see that Vienna Doctors' Chamber of
22 Austria, the British Ministry of Health, the Danish
23 Health Council have warned against excessive use of
24 mobile phones, especially by children, and they have
25 specific instructions such as avoid carrying mobile
26 phones in trouser pockets et cetera. Germany, the

1 country's Office for Radiation Protection has
2 recommended that children limit their cell phone use
5 and issued the following general tips for reducing
4 exposure to radio frequencies, such as buy phones with
5 a low specific absorption rate, use land lines where
6 available, make calls as short as possible.

7 And I guess I'm going to the cell phone
8 because we seem to have more information, but the idea
9 is that it's established that the frequency of the
10 link between smart meters and cell phones is the same.

11 So I'm just wondering if in your opinion,
12 Dr. Bailey or Mr. Warren or Mr. Loski, can you explain
13 why there is such a limited warning from Health Canada
14 as compared to other jurisdictions that seem to be
15 taking children's health much more seriously? In
16 other words, in my analysis of this, we don't seem to
17 be using the precautionary approach as much as we
18 possibly could. Do you have any idea why?

19 MR. LOSKI: A: All I can say is that it's up to Health
20 Canada to possess the evidence and provide us with
21 recommendations that they believe are protective of
22 public health, and they have issued those with --
23 regarding cell phones. And since the exposure from
24 smart meters is so far below that of mobile phones, I
25 don't think that there would be a pressing need for
26 them to revise that guidance.

1 MR. ATAMENENKO: Thank you. Mr. Loski, is there -- and I
2 think we've touched upon this before, but is there --
3 when we talk about Health Canada we talk about Safety
4 Code 6. Is there a reason why we don't have a
5 scientist from Health Canada here at the hearings?

6 MR. LOSKI: A: We did not feel it was necessary and we
7 did not reach out to anyone at Health Canada.

8 MR. ATAMENENKO: Q: Okay, thank you. I'm just going to
9 move on a little bit to talk about the United States.
10 There's several jurisdictions that have tried to pass
11 laws requiring mobile device packaging to contain
12 labels warning of potential health risks, but most
13 have failed, although many are still studying the
14 issue. The strongest legislation passed to date has
15 been in San Francisco, where the city passed a right
16 to know ordinance that would require cell phone
17 retailers to display posters and provide fact sheets
18 informing customers of potential health risk and
19 outlining how to reduce those risks. The law is to go
20 into effect October 25th. However, the industry group
21 CTIA which represents large wireless carriers like
22 Verizon and AT&T filed a lawsuit to block the
23 ordinance from taking effect.

24 It seems that there is some industry
25 inference, and I'm wondering if, Dr. Bailey, do you
26 agree that such industry attempts to prevent people

1 from being properly informed of the hazards so they
2 can adequately protect themselves from dangerous
5 levels of emissions may help to explain why it is
4 becoming more difficult to believe for the public and
5 for many of us to believe that the wireless industry
6 has the consumer's best interests at heart.

7 **Proceeding Time 8:39 a.m. T03**

8 DR. BAILEY: A: You know, I can't speak for them. I
9 don't know what their position would be. But my guess
10 would be that they would argue that if health agencies
11 haven't determined that there is a likely health risk,
12 then why would you be posting warnings about something
13 that you don't know is a confirmed hazard?

14 MR. ATAMENENKO: Q: So you, in your analysis, you don't
15 believe there is interference by the industry?

16 DR. BAILEY: A: I haven't made an analysis of that, I
17 just provided a comment. That's all I know.

18 DR. SHKOLNIKOV: A: I would like to add that the
19 specific absorption rate as well as the exposure from
20 devices including smart meter and cell phones is
21 publicly available and if you go to FCC website for
22 any phone, and there is nothing hidden, it's in public
23 domain and you can freely download the exposure for
24 every basically device that has wireless capability.

25 MR. ATAMENENKO: Q: Thank you. I'm going to go now to
26 my letter, I believe it's Exhibit C1-3. I'll give you

1 a minute to conjure it up.

2 Can I move on? Are we okay?

5 MR. LOSKI: A: Yeah.

4 MR. ATAMENENKO: Q: Okay. I'm not going to reiterate
5 what I say in the letter. However, the basic thrust
6 of it is that the Health Canada is committing to
7 reviewing Safety Code 6, to publicly communicate the
8 results, there's appointment of an expert panel, the
9 Royal Society, which has been selected as the means
10 for obtaining independent expert assessment for the
11 review of this code that's currently underway. And
12 it's anticipated that the expert panel report with
13 recommendations will be released by the Royal Society
14 in 2013. And an updated Safety Code 6 will be
15 published.

16 I guess my question is that would it not be
17 -- in light of the information, would it not be
18 prudent to, if not suspend the hearing, but at least
19 to wait for this new revised code which is coming out
20 this year before any concrete plans are made to
21 implement this technology by Fortis?

22 MR. LOSKI: A: I'll start by saying it -- you know,
23 certainly, can't predict what the Royal Society review
24 is going to come up with this year. But it is our
25 view that there is no basis to assume that there will
26 be any change coming out of that review, or that it's

1 far as to mean the advanced meters are no longer
2 compliant, it would also mean that so many different
5 wireless devices, virtually all wireless devices, I
4 would guess, that are used today, things like our cell
5 phones, WiFi routers, baby monitors, garage door
6 openers, the list goes on, all of those things would
7 also be non-compliant. And what that means from the
8 FortisBC, of course, as I alluded to in my opening
9 statement, we use a number of wireless devices in our
10 operations. Such a change to Safety Code 6 would mean
11 we could no longer do that and certainly then there'd
12 be all the attendant increase in cost of service that
13 would result from moving away from using those
14 technologies.

15 And so for all of those reasons, in my
16 view, it's not a reasonable conclusion to come to that
17 waiting could be justified, and I don't think it would
18 be a reasonable decision and wouldn't be such a
19 prudent decision to make.

20 MR. ATAMENENKO: Q: So almost, to use colloquial
21 language, it almost seems as if you'd have an inside
22 track of what Health Canada is doing. But in reality
23 what you're saying is that everything, all the
24 evidence that you've seen to date leads you to believe
25 that there won't be a significant change. However,
26 I'd like to submit that the possibility exists that

1 there are other concerned scientists in the world that
2 are publishing studies and that Health Canada and the
5 Royal Society might consider. So there might be some
4 changes. So I'll move now to --

5 MR. WARREN: A: Can I just comment on that briefly?
6 And I think one of the relevant points that was
7 brought up yesterday to that assertion was brought up
8 by Dr. Shkolnikov when he talked about the national
9 and international limits that do exist, and that even
10 if Safety Code 6 moved to any of those limits that
11 exist today, even the most stringent in the world,
12 that we would still be in compliance with the advanced
13 metering project. And he went on further to say that
14 the limits that are recommended in the Bioinitiative
15 Report 2007, which haven't been adopted anywhere in
16 the world, but are even more stringent, those would
17 also be met by the advanced meters.

18 So I think that really supports our view
19 that a change is not going to impact this project.

20 MR. ATAMENENKO: Q: Thank you. I'm going to continue
21 the -- now moving into Exhibit B1-13 where you --
22 Health Canada's response to Mr. Atamenenko in a letter
23 to me and continuing questioning based on that. Okay
24 there?

25 MR. HERBST: Just for ease of our witnesses, if Mr.
26 Atamenenko could perhaps describe what the exhibit is.

1 I'm not sure, I heard B1-13 but I'm not sure that
2 that's --

5 MR. ATAMENENKO: That's a response. It's a letter from
4 Fortis to me.

5 VOICE: B-13.

6 MS. HERBST: I believe Exhibit B-13. Thanks.

7 MR. ATAMENENKO: Q: Okay, we're ready to go.

8 MR. WARREN: A: I should also address, I neglected to
9 address your point about whether we have an inside
10 track and I can assure you we don't.

11 **Proceeding Time 8:49 a.m. T05**

12 MR. ATAMENENKO: Q: Okay, so that's reassuring.

13 In this letter and basically Mr. Loski
14 states that there is no basis to assume that any
15 revision of the code would be either recommended, or
16 if recommended, significant. So basically then the
17 questions I had in light of that would be irrelevant,
18 I guess, and, my questions were what would it mean to
19 the Fortis AMI program if stricter limits were
20 implemented in any updates to the Code in regard to
21 the effects of low-level EMR, and the other question I
22 had was, how can Fortis be so certain that the AMI
23 technology and program wouldn't be affected to the
24 point that they could not be deployed?

25 And so the feeling -- the answer I'm
26 getting from you is that regardless of how they move

1 the levels, it will still be within the guidelines
2 that you've set -- safety guidelines that have been
5 set. So there would not be any changes to the Code
4 that would make you think that perhaps you couldn't
5 implement the AMI technology. Is that --

6 MR. LOSKI: A: Well, yeah. As I said, I certainly
7 cannot predict what will be the outcome of the Royal
8 Society review. But as I said, based on our
9 understanding of the currently-available science, we
10 anticipate that a change is unlikely, and certainly we
11 believe it's extremely unlikely that there would be a
12 change so radical, such that then the advanced meters
13 would no longer be compliant.

14 So again that would mean for the advanced
15 meters to no longer be compliant, the Safety Code 6
16 limits would have to drop by 1,000 times. And again,
17 as Mr. Warren alluded to, that would also mean that
18 these limits would be lower than the most stringent
19 national and international standards in the world.
20 And again, it is our view that there is no basis for
21 such a change.

22 MR. ATAMENENKO: Q: Okay, thank you. There is the --
23 we are familiar with the letter of the Quebec
24 scientists in their recent open letter to the public,
25 which -- where they refute the concerns. And then
26 there is a rebuttal to their letter by Dr. Carpenter.

1 So, my question is, there is another angle.
2 What if a political decision was made to better
3 reflect the growing public concerns in our province?
4 For example, we've got 85,000 holdouts in the B.C.
5 Hydro service area. In Quebec, there is 10,000
6 signatures registered by a petition in the National
7 Assembly. So there is this thing called public
8 pressure, in people who become concerned. What is --
9 what if, as a result of public pressure, the Safety
10 Code was updated to suddenly require the makers of all
11 wireless technologies must include protective measures
12 especially in regard to children, you know, as a
13 result of what's happened in France, or just as a
14 result of public pressure. You know, we're going into
15 an election. What if there -- and it's possible there
16 may be different policies in our province.

17 What would -- how would Fortis answer those
18 concerns? And those are real concerns, I think.
19 We've seen them before.

20 MR. LOSKI: A: Understood. I've got a few points to
21 make in my response. First, as you point out, that
22 would be in your discussion here a political decision
23 and not a science-based decision. If -- again then,
24 if a decision was made to lower the Safety Code 6
25 limits, certainly the advanced meters would be one of
26 then the last technologies, if you want to put it,

1 touch again very briefly the topic of
2 electrosensitivity that we discussed yesterday. We
3 know that -- and this is something that we find in
4 rebuttal to the Quebec scientists that I guess Dr.
5 Carpenter mentions, is that there are medical
6 authorities such as the Santa Cruz County, that
7 they're worried about EHS after installation of smart
8 meters. There have been surveys in European countries
9 where they found that 10 percent of the population is
10 electro-sensitive. There are physicians that are
11 aware that EHS symptoms triggered by EMF exposures
12 below international limits, and the treatment that
13 they recommend is reduced EMF exposure.

14 If we can establish that in fact there are
15 people who are suffering from this, and I gave a few
16 examples yesterday, is there -- other than just
17 saying, "Well, you know, you can't live in your house
18 or you've got to move somewhere," is there something
19 contingent in the plans of FortisBC if we, through
20 investigation whether it's this hearing or -- that we
21 establish there are more and more people affected by
22 this medical disorder, is there something that you've
23 thought about as to how to address this? Because it's
24 very real. You know, I have a good friend in White
25 Rock. Her name is Linda Eward. She and I were
26 colleagues, were teachers. She cannot function in her

1 house with wireless technology. It's absolutely
2 impossible.

5 Now, if you put a smart meter on her house,
4 how does a person like that -- I mean these are real.
5 These are real people and they have real concerns and
6 it's not just one or two people. This was dismissed
7 fairly lightly yesterday, and I just want to -- I know
8 this is going to be brought again by others. I just
9 want to see if you have some kind of contingency
10 plans.

11 MR. LOSKI: A: Yes, and again sympathize with your
12 friend, Mr. Atamenenko. I, in my view, I don't
13 dismiss this lightly. We are not, at FortisBC, we are
14 not scientists and we are not doctors, so we need to
15 look to, as I said in the last couple of days, we need
16 to look to the authorities, including Health Canada,
17 to tell us, or to enlighten us, I guess, and provide
18 direction and guidance to what we do. And I have to
19 come back to, you know, what I talked about yesterday,
20 which is what the WHO has said and what I read out
21 yesterday, but to summarize that there is no
22 scientific basis to link the EHS symptoms to EMF
23 exposure.

24 And as I said, Health Canada, as I quoted
25 yesterday, is saying the same thing. Health Canada is
26 also saying specific to smart meters, and I read this

1 out the other day but -- and I'll read it again:

2 "Health Canada has concluded that exposure
3 to RF energy from smart meters does not pose
4 a public health risk."

5 So -- and I also mentioned the quote from Dr.
6 Carpenter along the same lines.

7 So again, our position is based on the
8 guidance in effect we've got from these organizations.
9 And the thing I would say in looking out let's say
10 toward the future, hypothetically I guess, but if at
11 some point in the future there was a change as it
12 related to these symptoms such that there was
13 something more definitive coming from these
14 organizations, then we would address that properly at
15 that time.

16 **Proceeding Time 8:58 a.m. T07**

17 MR. ATAMENENKO: Q: Okay, thank you. I'm going to --
18 I'd like to move on to the opening statement by you,
19 Mr. Loski, but before I do that I have one last
20 scientific question for Dr. Bailey. Is it true, or it
21 is -- can you confirm that microwaves are bioactive,
22 in that apparently low-intensity EMFs are used to
23 treat bone fractures, for example? Also they are
24 useful in treating chronic pain. Is that true?

25 DR. BAILEY: A: There are applications that are
26 licensed at a lower frequency range for the treatment

1 of bone healing in the -- more in the ELF range. And
2 there are many therapeutic applications of radio
5 frequency waves in terms of treatment of cancer, radio
4 frequency ablation of tissue during surgery and so on,
5 at very high intensities.

6 MR. ATAMENENKO: Q: So, as a lay person, if this is
7 true, then if EMFs are used in a positive way to treat
8 certain disorders, that means there is an effect on
9 our body. There is an effect. So if they can have a
10 positive effect on the body, would it not be logical
11 to assume that this radiation exists and it can have a
12 negative effect on our body, thereby triggering
13 certain disorders and in long-term possible cancers or
14 other diseases?

15 DR. BAILEY: A: The difference, sir, is that the levels
16 at which these fields are applied for therapeutic
17 purposes are much above the guidelines. So that --
18 and for medical applications, you can apply these
19 electromagnetic fields at much high levels. And,
20 frankly, for the radio frequency applications, these
21 levels would frequently involve, you know, very
22 substantial tissue heating and even burning
23 applications.

24 MR. ATAMENENKO: Q: Okay. Thank you. Going to your
25 opening statement, Mr. Loski, you mention that
26 wireless AMI is simply one example of the wireless

1 technology that is ubiquitous in Canada. Do you not
2 agree that it is -- it's widespread, that maybe we
3 should be slowing down and taking stock of where all
4 this is heading? Have we -- and I guess maybe this is
5 a repetition, I'll ask it anyways. Have we not --
6 have we established the real full potential for harm
7 by this -- by RF energy interactions with the
8 biological electrical systems that are inherent in
9 life forms? Are we one hundred percent sure that we
10 can move -- go forward?

11 THE CHAIRPERSON: I think that question has been
12 canvassed a number of times.

13 MR. ATAMENENKO: Okay. I'll move on. Thank you, Chair.

14 THE CHAIRPERSON: Thank you.

15 MR. ATAMENENKO: Q: Okay. The other one is, it's a
16 personal question. And you mentioned in point 8, like
17 our customers, we all have AMI at our homes where we
18 and our families live. So, would you let your
19 grandfather sleep on the side of the wall to a smart
20 meter if he had a pacemaker or other life-saving
21 sustaining medical devices? Would you want your
22 pregnant wife sleeping on the other side of the wall
23 to a smart meter, or how much would you allow small
24 children to be in contact with this technology?

25 MR. LOSKI: A: Certainly when I looked at -- you know,
26 got involved with this project, you know, certainly

1 needed to satisfy myself both as a Fortis executive
2 that what we were planning to do, you know, was going
3 to be safe. Also look at that from the perspective
4 of, you know, being a parent myself, a family man.
5 And I can tell you that based on, you know, all of the
6 science and the evidence before us, I've satisfied
7 myself on both of those. And I'd like to talk about
8 that a bit more, if I could, seeing as we're getting
9 into the personal here.

10 MR. ATAMENENKO: Q: Sure.

11 MR. LOSKI: A: You know, I have -- my advanced meter is
12 on the side of my house, which is -- it's probably, if
13 I calculate it or estimate, is probably about five or
14 six feet away from, you know, where my daughter
15 sleeps. And, you know, and beside her bedside is a
16 cell phone. My mother-in-law, elderly mother-in-law,
17 lives with us and my wife stays home to care for her.
18 We are -- I have satisfied myself, based on my review
19 that I'm not putting, you know, putting her at a
20 potential for adverse health effects.

21 So, I guess I've certainly satisfied myself
22 both from my responsibilities as an executive at
23 FortisBC as well as an individual.

24 **Proceeding Time 9:03 a.m. T8**

25 MR. ATAMENENKO: Q: Thank you. I just have a couple of
26 other questions. As a preamble I would just like the

1 Commission that we're doing this, this democratic
2 process, so thank you. It's important.

5 Hydro, B.C. Hydro didn't have to do this.
4 Does Fortis feel it's unfair that you should be here
5 undergoing this public review whereas B.C. Hydro was
6 exempt?

7 MR. LOSKI: A: I don't know if I can use the word
8 "fair", but as we talked about earlier in this hearing
9 and in speaking with Mr. Weafer, and as Mr. Kung
10 addressed in his opening statements, I think the fact
11 that B.C. Hydro did not have a process like this has
12 put much greater attention on this and certainly,
13 arguably I would guess, has resulted in a lengthier
14 and more significant process here, therefore
15 potentially and certainly arguably a more costly
16 process. I am sure that our customers would think it
17 fair and reasonable if some of those costs could be
18 shared by B.C. Hydro, but I do not think, based on my
19 experience, the Commission can make that happen.

20 MR. ATAMENENKO: Q: Well, we can make that an election
21 issue, I guess. I guess it's -- B.C. Hydro, there are
22 something like, and I mentioned, 85,000 households who
23 are holding out, doing their utmost to prevent being
24 forced to allow installations on their homes, and I'm
25 not sure if we talked about this, but do you have
26 contingency plans should something similar happen when

1 I as a B.C. Fortis customer say I don't want you guys
2 tampering with my meter? What's going to happen?

5 MR. LOSKI: A: I think we laid this out in a response
4 to one of the IRs, but -- and perhaps Mr. Warren can
5 answer this. No, our intention is to work with the
6 individual customers and hopefully we can get to the
7 point that we would be able to address the concerns,
8 perhaps that's through awareness, such that the
9 customer will allow an advanced meter to be put on
10 their home.

11 In the event that we are not successful in
12 doing that, there is an option that we have for our
13 customers, and this is normal course for us in terms
14 of when -- which would be that we could move the meter
15 so it'd be away from the house, to say the perimeter
16 of the property, although, again consistent with our
17 tariff and current practice, that would be a cost to
18 be borne by the customer. So that would be an option.

19 And then barring that, if that wasn't going
20 to be an option for the customer, then ultimately we
21 would be looking at the last option available to us,
22 which would be to disconnect the customer.

23 MR. ATAMENENKO: Q: Okay, thank you. That's all I'm
24 going to do this morning. There's other questions
25 that I could have asked. They will be, I'm sure,
26 included in the next presentation, so I'll let my

1 colleagues continue. I'd just like to thank you very
2 much for being here and doing this.

5 MR. LOSKI: A: Thank you.

4 THE CHAIRPERSON: Thank you, and also just before you
5 leave, I'd like to thank you as well. I can
6 appreciate you don't appear before this type of
7 tribunal on a regular basis and I'd like to thank you
8 for your fairly focused questions.

9 MR. ATAMENENKO: Thank you very much, Mr. Chair.

10 MR. FULTON: Mr. Shadrack is next, Mr. Chairman.

11 THE CHAIRPERSON: Thank you.

12 MR. SHADRACK: Good morning, Mr. Chairman and Panel.

13 THE CHAIRPERSON: Good morning, Mr. Shadrack.

14 **CROSS-EXAMINATION BY MR. SHADRACK:**

15 MR. SHADRACK: Q: For the sake of our two guests or
16 expert witnesses, my name is Andy Shadrack. I'm the
17 director for Area D in the Regional District Central
18 Kootenay and I'm here representing those constituents.
19 I'm the equivalent of what you call a county
20 commissioner in the United States.

21 **Proceeding Time 9:10 a.m. T09**

22 I do have, if it will be helpful, a list of
23 the materials I'm going to cross-examine on, Mr.
24 Chairman. I can --

25 THE CHAIRPERSON: That would be helpful, thank you.

26 MR. SHADRACK: Okay.

1 THE CHAIRPERSON: Presumably this is the order that you
2 intend to --

5 MR. SHADRACK: I will be moving around a bit, because
4 some things I want to try and pull together.

5 THE CHAIRPERSON: Sure.

6 MR. SHADRACK: Q: Okay. What I want to cross-examine
7 on today primarily are three areas of health. The one
8 that concerns me the most, I think, is the issue of
9 hyper-sensitivity. And then there are what I would
10 describe as there are constituents I have who have
11 general health concerns, and then beyond that as a
12 local government representative I have concerns about
13 a group of people, I guess, who I call the unaware.
14 And I want to put this in a context for the panel.

15 In my opening statement at the oral
16 hearing, I said in April of 2010 the board I sit on,
17 when adopting the land use bylaw for Area D, put in
18 general commercial policy that it supported the right
19 of communities to be informed of any changes to the
20 electromagnetic spectrum by all operators of cell
21 phone towers, WiFi systems, microwave systems, et
22 cetera, that create man-made electromagnetic fields
23 and also supports the right of communities to propose
24 zoning designations that apply to these operations.
25 So that's the context in which I'm here.

26 And I agree with Mr. Loski in his opening

1 statement at 38, and I think it's on page 2.7. And
2 you don't need to go there, Mr. Loski, but the
5 question of the ubiquitous nature of wireless, I want
4 to start at that place. I assume you have a cell
5 phone, correct?

6 MR. LOSKI: A: Yes.

7 MR. SHADRACK: Q: I've had mine since 2004. How long
8 have you had yours?

9 MR. LOSKI: A: I've had one probably since '96,
10 something like that.

11 MR. SHADRACK: Q: Do you have WiFi in your house?

12 MR. LOSKI: A: Yes, I do.

13 MR. SHADRACK: Q: Yeah. How long have you had it?

14 MR. LOSKI: A: Eight years, perhaps, give or take.

15 MR. SHADRACK: Q: Yeah. I've had WiFi since about
16 2003, if I remember. I've had a laptop since '96. So
17 I agree, we use these things.

18 Now, I'd like to take us to the preface to
19 Safety Code 6 in C-5. This is Appendix B-6 of B-1.
20 And I know we covered a lot of the issues yesterday,
21 but I want to drill down on it. And I want to look at
22 the sentence -- the last sentence of paragraph 2. And
23 I'll read it out.

24 "Safety Code 6 is not intended for use as a
25 product performance specification document,
26 as the limits in this safety code are for

1 2. And let's at the same time, because it's in a
2 graph form, look at B11-2 as well. This was a
5 correction to an IR.

4 So, am I right in understanding, in terms
5 of my house, let's use my house as an example. You're
6 attaching a smart meter. It's going to have the
7 option for a ZigBee HAN network. And then in
8 addition, and I'm going to bring one other point in
9 here, and this wasn't on the list, and I apologize,
10 but at B-15 -- B-15.

11 DR. SHKOLNIKOV: A: B one five.

12 MR. LOSKI: A: So what was the reference in B-15?

13 MR. SHADRACK: Q: B-15, it's IR response number 2, and
14 it's question 9.

15 MR. LOSKI: A: And this is from the -- one of your
16 questions?

17 MR. SHADRACK: Q: This is your response to my question
18 nine, all right? And what I'm wanting to do is, I
19 quote from CEC. And what CEC asked was, it talked
20 about 18 to 28 meters forming an RF mesh. So, we have
21 the smart meter on my house. We have the ZigBee HAN.
22 And then we have the area network. Then on top of
23 that we have the FM radio, potential satellite TV,
24 WiFi, cell phone, and then on top of that in the area
25 where I and Mr. Atamenenko -- we're told about radon
26 gas. All right? Now, it's 50 years since I did any

1 physics. But my understanding is, that gas is coming
2 off for from uranium. Am I correct in that? Is there
5 anybody on the panel? I mean, I'll leave it.

4 **Proceeding Time 9:20 a.m. T11**

5 DR. BAILEY: A: And other radio nucleotides in the
6 soil.

7 MR. SHADRACK: Q: Okay, so that in my regional
8 district, we're now encouraging people to properly
9 vent their basements to avoid that. That happens in
10 Castlegar where I live. So when I look at your
11 Undertaking 2 in response to Mr. Andrews, I say, are
12 the exposure limits that you're putting down here
13 reflecting the array of possibility? Because I'm a
14 public official. I'm the one who gets told in
15 relation to land use planning and other things that I
16 have some responsibilities around health and safety,
17 that I have some health responsibilities under the
18 *Building Code*. So that's where I'm coming from.

19 Do you see my dilemma as a public official?

20 THE CHAIRPERSON: Mr. Shadrack, what's your question?

21 MR. SHADRACK: Q: Well, the question is: Is this RF
22 exposure table running the gamut? Does it -- we've
23 got all these wireless going into the house. Do you
24 understand the point I'm trying to get an answer on?

25 DR. SHKOLNIKOV: A: So there are a few answers. One,
26 radon gas, because it is not a radio frequency

1 exposure, I would not add to the cumulative exposure
2 as it is not a -- not the same source of exposure,
5 doesn't even fall into the Health Safety Code 6
4 purview.

5 In terms of the -- is exposure in Table 1
6 of the Undertaking 2, does it cover the whole gamut as
7 I think I was very strongly cross-examined by CEC, the
8 answer is no. If you're inside the house and under
9 most conditions the numbers we have put in this table
10 for the smart meter are very conservative, and even --
11 I would -- actually based on the calculation we used,
12 even outdoors at half a metre which we compute, you're
13 unlikely to reach those values; inside the house
14 you're probably going to be much lower. So from that
15 perspective, yes, clearly, and deferring to CEC, we
16 could have -- we put in our report but we didn't put
17 in our table, you know, the whole gamut of how low the
18 exposure from the smart meter could get as opposed to
19 the value that we have conservatively estimated from
20 the device.

21 In terms of the multiple smart meters, I
22 believe the answer was provided both in the report and
23 maybe in some interrogatories, but I think the summary
24 of that is that the other -- that the additional
25 exposure from mesh network is -- because the other
26 smart meters are so far, it wouldn't even show up on

1 have included it into the calculation, you know, in
2 direct on the table, but I also have included as a
5 percent of it, heading up to .1 percent of the
4 exposure limit.

5 MR. SHADRACK: Q: And then the other factor that I want
6 to ask about is frequency of occurrence during the
7 day. And I note that Mr. Flynn quotes from a hearing
8 of Pacific Gas & Electric, a pulsed average 14,000
9 times a day, every six seconds, to a maximum of
10 190,000 pulse per day. Is that an accurate of what
11 people are going to face with a smart meter?

12 MR. WARREN: A: That's for a different product, Mr.
13 Shadrack.

14 MR. SHADRACK: Q: Okay. But it is true during cross-
15 examination on the issue of security, Mr.
16 Chernikhowsky did say that the smart meters will talk
17 to each other. So, and the other factor, am I not
18 correct, is that there will be a pulse, and I'm not
19 altogether clear how often, because you don't want the
20 meter to go to sleep. So there is a message going to
21 come out that basically says, "Hi, I'm here." Or
22 "Hello, I'm talking to you." I mean, so, how many
23 times a day are we really talking about? Because this
24 is really confusing for the average lay person. (a)
25 they're worried about the impact, and then on top of
26 that, you've got how many times is this thing beeping?

1 DR. SHKOLNIKOV: A: Yes. And I have to apologize for
2 radio frequency engineers. We don't typically spend
5 nearly as much time explaining the technology to
4 people, so I apologize. But as I have explained
5 yesterday, almost all modern technology transmits even
6 if you are not aware of it doing. So the fact that
7 your cell phone can receive a message, can receive a
8 phone call, is a function of the fact that it
9 continuously -- or I should say on a sustained basis,
10 because it's not really continuous, but on a sustained
11 basis tells the cell phone tower that it is alive.
12 The WiFi routers will also periodically send a signal
13 as part of something called ARP protocol. So even if
14 you're not using the WiFi router, it is sending the
15 packets.

16 Cordless phones also communicate with a
17 base station to remind it that it's still around when
18 a phone call comes in. Baby monitors, even if the
19 baby is not talking, are also transmitting about 100
20 times a second, just to notify the receiving station
21 that it is on. So, and I apologize, there is -- you
22 know, there is a difference between continuous and
23 sustained, and maybe that's the part that is
24 confusing.

25 All the technologies that we live in,
26 unless you literally take out a battery out of your

1 cell phone or put it completely off rather than stand-
2 by mode, will by necessity of the design -- of their
3 design, communicate with the surrounding devices. I
4 mean, it's kind of -- and how far it goes back. AM
5 radio, when it's in use, and I don't -- when it is
6 used, AM radio fluctuates in amplitude about, you
7 know, up to 10,000 times a second where the amplitude
8 jumps between a factor of two and five. And that has
9 been going back to the early days of radio.

10 So I think that the confusion here is that
11 it's -- as a technology has moved on, I understand
12 there hasn't -- it's become increasingly difficult to
13 put in lay people -- like in lay-speak, non-RF
14 engineer explanation of how the devices function, and
15 that has, you know, as my wife refers to it, you know,
16 I don't want to touch it, it's magic. That's what my
17 wife tells her. I can't teach her that as well. And
18 I would apologize on behalf of all interveners to not
19 spending as much time on educating of how the
20 technology functions.

21 **Proceeding Time 9:29 a.m. T13**

22 MR. SHADRACK: Q: But I do think it will be very
23 helpful in relation to B11-2, if instead of providing
24 a graph that shows all these things as separate, if we
25 showed people what the cumulative exposure was and if
26 we had a table that showed what the cumulative

1 exposure was so that people could get an
2 understanding. Because that to me is the fear for
5 people.

4 MR. WARREN: A: Just to be clear, Mr. Shadrack, the
5 table -- and I will certainly defer to Dr. Shkolnikov
6 to correct me, but is cumulative exposure over six
7 minutes essentially.

8 DR. SHKOLNIKOV: A: I think that your question is why
9 didn't we add up all exposure from all the sources in
10 the stable into one value? And the answer is kind of
11 eyeballing it, even if we assume all of them were as
12 high as a WiFi, which is .1 percent, then adding 1, 2,
13 3, 4, 5, 6, then even if we assume they're all at the
14 same high as a WiFi, they would still be under 1
15 percent of the Health Canada Safety Code 6.

16 MR. SHADRACK: Q: But in Transcript 3, I mean, I'm
17 standing here, and Mr. Weafer between page 453 at line
18 20 to 477 to line 4, he goes through an extensive
19 argument that the Commission should consider that it's
20 lower. I guess I'm coming from the other point of
21 view and saying, well, no, there's a range here and
22 the range is higher than what Mr. Weafer is arguing.
23 I put to that you. Am I correct in that?

24 DR. SHKOLNIKOV: A: Well, I think you're addressing
25 different issues. Mr. Weafer was arguing that we have
26 used a very conservative standard for estimating the

1 exposure. And as I have addressed, yes, we have
2 because we followed Industry Canada. And I think the
5 question you are asking is if I start -- if you start
4 adding all the other sources where, you know, other
5 sources, what the exposure would be.

6 And so what I would say is that typical
7 exposure from the smart meter would increase exposure
8 by about one ten-thousandth of the Safety Code 6 in
9 addition to other devices, although I defer to Mr.
10 Weafer it would be one millionth.

11 So, you know, you can add up all the
12 devices here as I have mentioned, but if you were to
13 plot on this graph 100 percent for Health Canada,
14 then, you know, according to me you wouldn't --
15 according to the calculations we have performed for
16 Industry Canada, you wouldn't be able to see the
17 contribution, and according to Mr. Weafer I wouldn't
18 even be able to find a printer that would print fine
19 enough line.

20 MR. SHADRACK: Q: I think this point has been covered
21 enough and I don't want to belabour it. But I do have
22 one question before we go to 8.5 and I want to address
23 it to Mr. Bailey. The Commission at G-177-12 said it
24 had no jurisdiction over Safety Code 6, and I don't
25 disagree with that. But if in this hearing they heard
26 things that were of concern, primarily brought by Mr.

1 MR. SHADRACK: Q: Okay, just shy of \$9100. And if we
2 go --

5 MR. LOSKI: A: Sorry for everyone, because I don't know
4 if everyone has this, but this is --

5 MR. SHADRACK: Q: No, they don't. You're the only one
6 that has it.

7 MR. LOSKI: A: Taxable CPP benefits of just under
8 \$9100.

9 MR. SHADRACK: Q: Yeah. So if we go to the bottom at
10 13, there is a list of what the boxes -- can you just
11 read out what that first sentence says, please?

12 MR. LOSKI: A: Okay. So, again, this is a statement
13 from the Canada Revenue Agency, a statement of Canada
14 Pension Plan benefits, and box 13 --

15 "For a disability benefit, this is the date
16 a person is determined to be disabled for
17 CPP purposes. For retirement benefit, this
18 is the date the benefit became payable."

19 MR. SHADRACK: Q: Okay. So, there is a box 16, isn't
20 there? On that form.

21 MR. LOSKI: A: Box 16, yes.

22 MR. SHADRACK: Q: And it says that that's -- therefore
23 it indicates that this is a pension for a disability.
24 Am I correct?

25 MR. LOSKI: A: Yes. In Box 16, it states, "Disability
26 benefit," and then it has the dollar amount as I said,

1 just shy of 9100.

2 MR. SHADRACK: Q: So, I put it to you that someone on a
5 disability pension with that low of an income could
4 not afford to relocate their meter.

5 I mean, what are we looking at, in terms of
6 the cost of relocating a meter?

7 MR. LOSKI: A: The cost of relocating a meter is going
8 to be dependent on a number of variables. You know,
9 things such as, you know, the distance away from the
10 premise that the meter would be relocated to, whether
11 it's underground/overhead service, and other -- there
12 would be other variables as well. So it can be quite
13 a range. You know, certainly it wouldn't be
14 unexpected in some circumstances to be a thousand
15 dollars or more.

16 MR. SHADRACK: Q: Yeah. So we're asking someone who's
17 on a disability pension to consider spending one of
18 the \$9,000 relocating their meter. That's an unfair--

19 THE CHAIRPERSON: Mr. Shadrack, I would appreciate it if
20 you would ask questions.

21 MR. SHADRACK: Sorry.

22 THE CHAIRPERSON: Please. And it's quite appropriate to
23 have a preamble. I don't -- I'm not denying that.
24 But this is an opportunity for you to cross-examine
25 the witness panel.

26 MR. SHADRACK: Q: So would you agree? That it's a

1 hardship?

2 MR. LOSKI: A: First, I'd like to say that, to be
3 clear, that this payment is something that is not --
4 or is driven by a potential customer's decision to
5 want to relocate the meter. And with that, then, if
6 the customer makes that decision, then, yes, there
7 will be a payment.

8 I recognize for some people certainly a
9 payment of that is going to be more difficult than it
10 would be for other people. Absolutely, I accept that
11 and understand it. And this type of situation is
12 something that generally -- you know, we deal with in
13 normal course today, and we make every effort to work
14 with customers to come up with payment plans to deal
15 with, you know, significant -- you know, monies owing
16 that -- where the customer is having difficulty
17 paying.

18 So we would certainly in a situation like
19 this, with this individual, if it went this way, we
20 would be looking to work with that person to develop a
21 payment plan that is going to be workable.

22 **Proceeding Time 9:40 a.m. T15**

23 MR. SHADRACK: Q: Can we drop down to lines 21 to 22.
24 Where you explain that after three months you would
25 consider suspending the customer's service.

26 Now, there's an interesting line --

1 MR. MACINTOSH: Mr. Chair, I object only because of a
2 concern about scope of questioning, given the day's
5 agenda for this panel, which is dealing with health.
4 I don't think that these costs issues and opt-out
5 issues are part of this oral hearing.

6 THE CHAIRPERSON: I think -- Mr. Shadrack, do you have a
7 response to Mr. --

8 MR. SHADRACK: My concern is this. I said at the
9 beginning of this cross-exam I was concerned about
10 people with hypersensitivities. I'm concerned about
11 people who have health concerns around the deployment
12 of these meters. And I was just about to ask Mr.
13 Loski what the extenuating circumstances were that
14 would allow someone not to have a smart meter deployed
15 in relation to health. I think that's a reasonable
16 question given that's in the -- I'm not trying to go
17 out of scope. I understand. My questions are all
18 health related.

19 THE CHAIRPERSON: But I think that question is probably a
20 question that you should move on to because that
21 clearly is more related to health. So I'd ask you to
22 move to that question.

23 MR. SHADRACK: Q: So can you define for us what
24 extenuating circumstances are in your application?

25 MR. LOSKI: A: Yes. Here what we're referring to
26 specifically here is, again, after a period of three

1 months of refusal, then there would be a
2 disconnection. So here what we're talking about with
3 these extenuating circumstances relates to that
4 situation, and an example would be when we wouldn't
5 disconnect in these -- we wouldn't disconnect would
6 be, for example, if it's the dead of winter and
7 someone uses power to heat their home. Well, we would
8 not be disconnecting in that circumstance. Similarly,
9 if someone has medical equipment in their home that
10 they need to survive and it's run off of electricity,
11 we would not be disconnecting service.

12 This was not meant to be something then
13 that just -- that was allowing opt-out.

14 MR. WARREN: A: I should also add that this was not a
15 new policy for FortisBC. This is our existing
16 practice today for situations, whether it's a non-pay
17 disconnect or a disconnect that's required for some
18 other reason. This is effectively current process.

19 MR. SHADRACK: Q: So I'm to understand if someone
20 brought a letter from a doctor saying I have a health
21 condition, you wouldn't agree that that was an
22 extenuating circumstance. And I'm asking this
23 specifically in relation to someone, like Ms. Nicholas
24 for example.

25 MR. LOSKI: A: The short answer is that's correct.
26 Based on what we're proposing, there's no opt-out for

1 any reason.

2 MR. SHADRACK: Q: Before I move on there is one last
5 question. We've talked about all the other wireless
4 devices that we own and used. They're all optional,
5 aren't they?

6 **Proceeding Time 9:45 a.m. T16**

7 MR. WARREN: A: Whether you choose to have a cell phone
8 or a WiFi router or something to that effect is
9 certainly at the choice of an individual person.
10 Whether you are exposed to signals from cell phone
11 towers, however, is another matter. And so you can
12 consider it a matter of personal choice, I suppose,
13 but it will not prevent you from being exposed to low
14 levels of radio frequency signals in the environment.

15 MR. SHADRACK: Q: But from a health perspective, a
16 consumer perspective, if I choose to avoid something,
17 I can.

18 MR. WARREN: A: You can avoid purchasing something, I
19 agree with you there.

20 MR. SHADRACK: Q: Yeah. But in this instance, I can't
21 avoid purchasing power from Fortis, can I?

22 MR. WARREN: A: Well, technically yes, but I wouldn't
23 want to be without power, no.

24 MR. SHADRACK: Q: And as a consumer, I don't have a
25 choice. I can't go to another utility and buy power
26 from another utility. Fortis, like B.C. Hydro in

1 terms of service territory, has a monopoly.

2 MR. WARREN: A: Yes, a natural monopoly, that's
5 correct.

4 MR. SHADRACK: Q: Yeah. So in relation to the market
5 and the society we live in, why should Fortis be
6 different than my ability to choose whether I want to
7 buy a cell phone or WiFi? When it comes to purchasing
8 electricity. I've -- oh.

9 MR. MACINTOSH: Excuse me, Mr. Chair. That's an enormous
10 discussion that's outside the purview of this hearing,
11 let alone this scope. It has to do with the
12 circumstance of a publicly regulated utility and the
13 fact that in exchange for having a monopoly or near a
14 monopoly sometimes in providing a service, it is
15 answerable to a regulatory body like this one. And
16 the reason we're here is to get permission to install
17 the meters, which requires the company to satisfy to
18 the Commission that the meters are safe.

19 And it's beyond the scope of today, and
20 beyond the scope of this panel, to get into a
21 discussion of why it is that the utility, if it
22 obtains the Order in question, is able to install
23 these smart meters.

24 It's a very large discussion, it's an
25 interesting topic, but I mean, you know, I mean that
26 accurately, but it's outside the scope of this

1 questioning, I submit.

2 THE CHAIRPERSON: Mr. Shadrack, do you have a response to
5 Mr. Macintosh's comments?

4 MR. SHADRACK: In relation to this application, Mr.
5 Chairman, I put it to the panel that as a consumer in
6 this society I have the right not to purchase
7 something if I think it might harm my health. And in
8 relation to this application, I'm asking Fortis why
9 should they be different than the norm in this
10 society. On a health matter. Why is that wrong for
11 me to ask that question?

12 MR. MACINTOSH: Well, with great respect, there is some
13 rhetoric there that has a persuasiveness to it, but
14 let me try and answer it. The reason is that the
15 issue here is whether the meters are safe or not.
16 That's the issue. The issue is not how is it that if
17 the meters are safe, the customer is required to take
18 them. That's an opt-out topic, in my respectful
19 submission.

20 THE CHAIRPERSON: Thank you. Just give me a moment to
21 confer with my colleagues.

22 I think we'll allow a question on the
23 topic, if you can phrase your comment as a question.
24 But being mindful of the scope of this hearing is to
25 entertain a request for -- from Fortis, for a
26 Certificate of Public Convenience and Necessity, to

1 here that is different when it relates to an advanced
2 meter as compared to consumer items such as cell
3 phones, WiFi's, *et cetera*, and that is in fact that
4 the utility owns the meter and it's part of the
5 utility system. So that's part of it.

6 Secondly then, as we've been looking at
7 here and talking about over the last several days, is
8 that -- again based on what agencies like Health
9 Canada are saying is that, you know, there are no
10 adverse health effects from smart meters.

11 MR. WARREN: A: And I would add to that response a
12 little bit, to your question as well, Mr. Shadrack,
13 that as I'm thinking through this a little bit, that
14 if a customer -- and by way of analogy, which is
15 perhaps a little bit dangerous, but if a customer said
16 that they wanted an electromagnetic meter on their
17 house and that was the only way they were going to
18 accept service, that would be equally unacceptable.
19 This is why the utility applies to the Commission, why
20 there is a regulatory board, is that that's who we
21 answer to in terms of the equipment that's installed
22 on customers' properties.

23 MR. SHADRACK: Q: I'm having a problem with this and I
24 want to go further.

25 THE CHAIRPERSON: I think you have an answer, Mr.
26 Shadrack.

1 MR. SHADRACK: I agree I have an answer.

2 Q: Does Fortis in the workplace accommodate people
5 for reasons of health?

4 MR. WARREN: A: That's a very general question.

5 MR. SHADRACK: Q: Okay, I'll be specific. Some
6 workplaces now are scent free.

7 VOICE: Scent free?

8 MR. SHADRACK: Q: Scent free. In other words, people
9 don't wear perfumes.

10 MR. WARREN: A: I guess that -- yeah, I'm aware that
11 some are, that's right. If you're getting at are
12 there RF emission, or is there equipment in the Fortis
13 offices and Fortis workplace that emit RF emissions,
14 yes, and leave it at that.

15 **Proceeding Time 9:55 a.m. T18**

16 MR. SHADRACK: Q: No, I'm asking whether you -- I'm
17 specifically asking whether you accommodate employees
18 for a variety of health-related things. Disabilities.
19 All right? Are your workplaces wheelchair-accessible?

20 MR. LOSKI: A: Well, we certainly, you know, comply
21 with all of the applicable legal framework with
22 respect to that, and then comply with our union
23 agreements, et cetera, with respect to that. I'm not
24 sure -- frankly I don't know how that relates to
25 advanced meters and this application, but --

26 MR. SHADRACK: I see Mr. Macintosh looks like he's about

1 ready to rise, and I'm wondering --

2 THE CHAIRPERSON: Well, I'm getting ready to rise too.

5 So, I --

4 MR. MACINTOSH: Well, let me have a try.

5 MR. SHADRACK: All right.

6 MR. MACINTOSH: I mean, the question sort of proves the
7 point of why this questioning shouldn't go further,
8 and here is why. Any issue at the workplace that
9 involves worker safety or looking after people who are
10 handicapped, the company has to comply with a myriad
11 of provincial regulations. And those regulations are
12 put in place, as I say, by the provincial government,
13 some of them by the federal government.

14 This hearing is another example of that.
15 Here is a regulated utility that needs to come to a
16 regulator to show -- to endeavour to show, that the
17 product in question is safe enough. One of the
18 touchstones for that will be comparison with a federal
19 standard.

20 So, I mean, it's an interesting comparison.
21 But to get into all of the different ways in which
22 either customer safety or worker safety is adhered to
23 is getting too far afield. And we should just stick
24 to the health issues regarding the smart phones.

25 THE CHAIRPERSON: Mr. Shadrack, do you have a response to
26 that concern?

1 MR. SHADRACK: I'll simply observe this, all right? In
2 relation to health and sensitivities, I would observe
3 that Section 15 of the *Charter* says we have a duty to
4 protect and not discriminate against people with
5 mental and physical disabilities. I'll leave it at
6 that.

7 THE CHAIRPERSON: Thank you.

8 MR. MACINTOSH: Just before I get fired, I should replace
9 my earlier comment on smart phones with AMI, when I
10 just spoke.

11 THE CHAIRPERSON: Just on that point, Mr. Macintosh, I
12 have noted through this past week we've referred to
13 the particular meters in question as advanced meters,
14 smart meters, those meters, et cetera. And I think
15 it's important that the record be clear that this is a
16 hearing on an application for the Fortis advanced
17 metering infrastructure project, and we're talking
18 about advanced meters here. Now, they're referred to
19 as -- in a variety of different ways, but I just want
20 to make sure there is no misunderstandings going
21 forward on that.

22 Please continue, Mr. Shadrack.

23 MR. SHADRACK: Q: I want to go to -- now to page 496 on
24 -- transcript 3. And I want to discuss with Dr.
25 Bailey his testimony in answer to Mr. Miles. And I
26 have the two documents from -- I believe it's C11-6.

1 **Proceeding Time 10:00 a.m. T19**

2 MR. SHADRACK: Q: So, Dr. Bailey, and I think I want
5 to get clear on something. When we look at papers and
4 we talk about peer review, my background is a
5 political scientist so I delivered a paper to a
6 symposium two weeks beforehand. That paper was sent
7 out to two of my peers who were knowledgeable on the
8 subject I was writing about, and then at the symposium
9 they critiqued me in terms of methodology and
10 everything else. Are we agreed that's what peer
11 review means in the academic world?

12 DR. BAILEY: A: Yes, that's a succinct description,
13 yes.

14 MR. SHADRACK: Q: And are we also agreed that in terms
15 of a peer review it's very important that the people
16 who are doing the critique when it's peer reviewed are
17 actually knowledgeable on the subject and are in fact
18 able to speak to that subject because they've got the
19 experience and the training to do so?

20 DR. BAILEY: A: Yes, that's an aspect of this,
21 certainly.

22 MR. SHADRACK: Q: And could we say that in terms of
23 expert witnesses as well?

24 DR. BAILEY: A: Yes.

25 MR. SHADRACK: Q: So at 496, 20 to 24, you say: "...we
26 don't have any kind of indication about what kind of

1 assessment or review, what studies were considered or
2 not..." et cetera, et cetera.

5 Are you concerned about the methodology of
4 the documents or are you concerned about the
5 conclusions that the documents that Mr. Miles
6 presented to you? What is it you are concerned about
7 here? And I raise that in the sense that these are
8 two documents from the American Academy of
9 Environmental Medicine, and there's a long list of
10 board of directors, all of whom are physicians. I'm
11 sorry, I don't know what a D.O. is. Perhaps you could
12 elucidate what a D.O. is. I know what an M.D. is but
13 what's a D.O.?

14 DR. BAILEY: A: It's an osteopathic physician.

15 MR. SHADRACK: Q: Okay, thank you. Because I'd like to
16 go over this. I'm concerned about your approach here.
17 And maybe we can take a minute and put this aside and
18 go to your own report on page 4, and I'm looking under
19 "Dose-response assessment" and I'm looking at the
20 third paragraph. Why is this in your report? What
21 were you trying to illustrate here?

22 DR. BAILEY: A: This whole section is described on page
23 3, starting on page 3 as evaluating scientific
24 research so as to help people understand how
25 scientists perform health risk assessments and how
26 this is relevant to the review and assessment of

1 research on radio frequency fields.

2 MR. SHADRACK: Q: Okay. But is there a problem here
5 with the way you state this? And particularly around
4 the sodium hypochlorite. Yes? No?

5 DR. BAILEY: A: I don't know. I don't have a question
6 here.

7 **Proceeding Time 10:05 a.m. T20**

8 MR. SHADRACK: Q: Okay. Did you write a paper with
9 Linda Erdreich in 2007 which it -- for health physics,
10 "Accounting for human variability and sensitivity in
11 setting standards for electromagnetic fields".

12 DR. BAILEY: A: Yes.

13 MR. SHADRACK: Q: And can you confirm that the
14 abstracts -- and I'm going to read a portion of it
15 out, because I think it's really important --

16 "...biological sensitivity and variability are
17 key issues for risk assessment and standard-
18 setting. Variability encompasses general
19 inter-individual variations in population
20 responses while sensitivity relates to
21 unusual or extreme responses based on
22 genetic, congenital, medical, or
23 environmental conditions.

24 For risk assessment and standard-setting,
25 these factors affect estimates of the
26 thresholds for effects and dose response

1 relationships and inform effects to protect
2 the more sensitive members of the
5 population, not just the typical and
4 average."

5 Is that a correct --

6 DR. BAILEY: A: It is.

7 MR. SHADRACK: Q: Okay. So let's go back to the last
8 sentence of that paragraph that I referred to in C-5.

9 "...the concentration of sodium hypochlorite
10 is extremely low and the dosage far too low
11 to produce toxic effects."

12 DR. BAILEY: A: Excuse me. I thought we were on page
13 3. Have you moved to a different page?

14 MR. SHADRACK: Q: Sorry, I said page 4.

15 DR. BAILEY: A: Oh, I'm sorry.

16 MR. SHADRACK: Q: My apologies if I misquoted the page
17 number. And what I'm referring to is "and the dose is
18 far too low to produce toxic effect."

19 Is that true in all cases?

20 DR. BAILEY: A: That is the way that public health
21 agencies have determined the acceptability of
22 protecting the population from disease due to water-
23 borne bacteria through disinfection systems, and have
24 made an assessment as to the public health benefit
25 versus any potential or real risks.

26 MR. SHADRACK: Q: But is it not true within the

1 population that there are persons who are so sensitive
2 to chlorine that they can't tolerate it?

5 DR. BAILEY: A: I know that there are -- or I am aware
4 that there are concerns of people that they have
5 reactions to trace amounts of chemicals in the
6 environment, in their foods, and I would assume that
7 that would apply to chlorine in drinking water as
8 well. Whether those have been scientifically
9 established or not, I couldn't say.

10 MR. SHADRACK: Q: So, are you saying that you don't
11 recognize -- or you don't agree with the term
12 "multiple chemical sensitivities"?

13 DR. BAILEY: A: I don't have a disagreement about
14 people using the term. I just don't find from a
15 scientific perspective that it's very informative to
16 me.

17 MR. SHADRACK: Q: Okay. Do you agree that there are
18 tests, diagnostic tests, that we can run to do this?

19 DR. BAILEY: A: I am aware that there are a variety of
20 tests that are applied. I have not made a thorough
21 study of all of the ones that are used to look for
22 chemical sensitivity, but I am aware that a variety of
23 tests can be applied.

24 MR. SHADRACK: Q: So is it possible that someone could
25 be shown to have a toxic effect at a low level?

26 DR. BAILEY: A: Under the appropriate testing

1 conditions, that might be possible. But I don't have
2 -- I don't accept it as a general proposition
3 independent of scientific evidence.
4 MR. SHADRACK: Q: Are you familiar with the Alcat test,
5 for example?
6 DR. BAILEY: A: The what?
7 MR. SHADRACK: Q: The Alcat test.
8 DR. BAILEY: A: I am not.
9 **Proceeding Time 10:10 a.m. T21**
10 MR. SHADRACK: Q: Okay. All right. What about, you
11 talk about "application of sunscreen lowers an
12 individual's exposure to sunlight, thus reducing the
13 risk of sunburn". Aren't there variabilities within
14 the human population in terms of protection to
15 sunburn?
16 DR. BAILEY: A: Certainly.
17 MR. SHADRACK: Q: Pigment, skin pigmentation, correct?
18 DR. BAILEY: A: Yes.
19 MR. SHADRACK: Q: And is it not also true that
20 sunscreen in some individuals is not a protection at
21 all, and we know that from the rise in the incidence
22 of cancer?
23 DR. BAILEY: A: There are varying degrees to which the
24 application will provide protection from the sun, and
25 unfortunately many people have not been that diligent
26 about applying sunscreens either. So I think both of

1 those things could be factors in the rise of adverse
2 effects from sun exposure.

5 MR. SHADRACK: Q: But I put it to you in terms of this
4 general statement where you're talking about dose
5 response and relating it back to electromagnetic
6 hypersensitive -- electromagnetic frequencies, that in
7 accordance with your abstract in 2007, that there's a
8 huge range of variability in response.

9 Is it not true that some scientists have
10 said they think there might be a genetic
11 predisposition to electrical hypersensitivity?

12 DR. BAILEY: A: I have heard that but I have not seen
13 any scientific evidence on this.

14 I think I would just to just clarify
15 something here. You've asked me about these examples
16 we gave about sunlight and sodium hypochlorite. This
17 goes back to the earlier stage of risk assessment. We
18 have determined conclusively that sunlight and sodium
19 hypochlorite have toxic properties. The hazard
20 assessment has concluded that these are known hazards
21 and toxic -- and have adverse effects.

22 The question then is, at what level of
23 exposure to something that is known to have an adverse
24 effect do we allow exposures? The propositions that
25 you have been putting to me regarding radio frequency
26 fields, we haven't determined in the relevant range of

1 exposures in our everyday environment that there is a
2 hazard. We haven't established that. And so that's
3 the difference between talking about potential
4 sensitivity to sunlight or potential sensitivity to
5 chlorine in the water supply. Here in those cases we
6 have a confirmed hazard, and the question in the dose
7 response is at what level do these adverse effects
8 become so low as to not be of concern?

9 In the case of radio frequency fields at
10 levels found in everyday environment, we haven't
11 identified that hazard.

12 MR. SHADRACK: Q: But like chlorine, we have identified
13 that there are hazards to electro frequencies.

14 DR. BAILEY: A: At high intensities.

15 MR. SHADRACK: Q: Yeah.

16 DR. BAILEY: A: Not typically found in our everyday
17 environment.

18 MR. SHADRACK: Q: But I put it to you that we've also
19 determined that we have people who react to chlorine
20 at very low levels. In line with what you wrote in
21 2007.

22 **Proceeding Time 10:15 a.m. T22**

23 DR. BAILEY: A: My -- what I wrote in 2007 did not
24 establish that people react to chlorine at very low
25 levels.

26 MR. SHADRACK: Q: No, but you used it as an example for

1 dose response assessment, the chlorine. You said
2 there was no toxic effect at a low level. I think
5 we've established that for some people there is a
4 response. Am I correct?

5 DR. BAILEY: A: As I said before, I haven't seen that
6 evidence. So with regard to what may or may be
7 people's reactions to trace amounts of chlorine in the
8 water supply, I haven't examined that. So, I don't
9 know what the scientific evidence is for or against
10 whether someone does have a response at the levels of
11 chlorine in that water supply. But I would say that's
12 a matter for scientific evidence to determine, not
13 frank opinion.

14 MR. SHADRACK: Q: Okay, let's go back to the American
15 Academy of Environmental Medicine document. And I
16 think this links into the World Health Organization
17 document as well.

18 THE CHAIRPERSON: Mr. Shadrack, is this -- just a
19 practical point of view here, or point. Is this a new
20 line of questioning? Or -- because I do want to allow
21 everybody to have a break, and I -- if this is a
22 convenient time, I'd like to do that.

23 MR. SHADRACK: Sure.

24 THE CHAIRPERSON: If this is a continuation --

25 MR. SHADRACK: That's fine. No, no.

26 THE CHAIRPERSON: Does this work for you?

1 MR. SHADRACK: Yeah, this works.

2 THE CHAIRPERSON: Okay. Thank you. All right. It's --
3 my watch says twenty after ten. We'll break for 15
4 minutes and be back at 25 to 11:00. Thank you.

5 **(PROCEEDINGS ADJOURNED AT 10:17 A.M.)**

6 **(PROCEEDINGS RESUMED AT 10:33 A.M.)** **T23/24**

7 THE CHAIRPERSON: Please be seated.

8 Please continue.

9 MR. SHADRACK: So, Mr. Chair, I'd like to turn to what I
10 think is B15-1 and it's a response to BCH 2.6, and I'm
11 doing this still in relation to the two documents
12 filed in C11-6.

13 Q: So this is the World Health Organization and
14 Electromagnetic Fields and Public Health document,
15 it's a Backgrounder in 2005. And at the top of page 2
16 the word "idiopathic" is used, Dr. Bailey, and that
17 means there's no causality, right?

18 DR. BAILEY: A: Yes.

19 MR. SHADRACK: Q: Okay. But can we now go to
20 Conclusions. Where it starts,

21 "The symptoms are certainly very real and
22 can vary widely in their severity..."

23 And then it specifically talks to physicians and I'm
24 looking at the last paragraph of that section. It
25 says:

26 "Treatment should aim to establish an

1 effective physician/patient relationship,
2 help develop strategies for coping with the
3 situation, and encourage patients to return
4 to work and lead a normal social life."

5 So I understand that your position is that
6 EMS doesn't exist. Is that correct?

7 DR. BAILEY: A: I understand that there are individuals
8 who have symptoms that are troubling them or causing
9 difficulties or perhaps worse.

10 MR. SHADRACK: Q: Okay, I don't want --

11 DR. BAILEY: A: But I don't have, I don't have -- I
12 don't see the scientific evidence, nor does the WHO,
13 that these can be linked to radio frequency fields at
14 the levels in our environment.

15 MR. SHADRACK: Q: I don't want to mischaracterize your
16 testimony here. So I'm going to put a number of
17 statements to you. Are you simply saying, "We have no
18 proof"?

19 DR. BAILEY: A: In essence that's what the WHO, and I
20 would agree that there's not scientific proof that
21 radio frequency fields is the cause of these symptoms.

22 MR. SHADRACK: Q: Are you saying we have no proof?

23 DR. BAILEY: A: The evidence -- it's not that there's
24 no research or nothing -- there's no evidence at all;
25 that the evidence does not persuade that there is a
26 cause and effect relationship.

1 is no proof, but we're treating people who say they've
2 got this. I mean, are you saying -- and I don't want
5 to put words in your mouth -- we have no proof,
4 therefore we can't treat these people?

5 DR. BAILEY: A: I have not said that.

6 MR. SHADRACK: Q: No? Well, then, I want to go back
7 now to the American Academy of Environmental Medicine
8 document. And I want to go back to your testimony at
9 20 to 24. And I'm -- I'm going to ask you a question,
10 and I don't want you to misconstrue what I'm saying.
11 But in the responses you gave to Mr. Miles, is there a
12 bias in your opinion? Are you biased? Are you
13 prejudiced against this document?

14 DR. BAILEY: A: The AAEM document?

15 MR. SHADRACK: Q: Yes.

16 DR. BAILEY: A: I don't have a prejudice against it,
17 sir. I just find it to be scientifically inadequate.

18 MR. SHADRACK: Q: Well, let's look at the bibliography.
19 Are you familiar with the *Journal of Bioelectricity*?

20 DR. BAILEY: A: Yes, I've read papers in it.

21 MR. SHADRACK: Q: Okay. So, on the first page, it
22 says,

23 "Based on double-blind placebo controlled
24 research in humans, medical conditions and
25 disabilities that would more than likely
26 benefit from avoiding electromagnetic and

1 radio frequency..."

2 So my understanding is that in '91, Rea,
5 Pan and Fenyves determined in a double-blind study
4 that there was electro hypersensitivity.

5 DR. BAILEY: A: Only, sir, only a part of that study
6 involved double-blinding. And this is more akin
7 almost to a case series report. And that was in 1991,
8 and since then many other studies have been done which
9 do not support those findings.

10 MR. SHADRACK: Q: Are you familiar with the
11 *International Journal of Neuroscience*?

12 DR. BAILEY: A: You know, I'm familiar with literally
13 probably maybe a hundred different journals. You'd
14 have to point me to a particular paper to see if there
15 was something --

16 MR. SHADRACK: Q: Okay. Do you remember a paper in
17 2011 by McCardy *et al.*?

18 DR. BAILEY: A: I do.

19 **Proceeding Time 10:42 a.m. T26**

20 MR. SHADRACK: Q: Okay. Did he argue that they had
21 found hypersensitivity?

22 DR. BAILEY: A: They reported a series of tests on a
23 single person. And from some of that data they
24 suggested that this was proof of electrical
25 hypersensitivity. You know, the observations
26 themselves were not totally persuasive. And this has

1 not been found in many other investigations of persons
2 with -- who have symptoms of electrical
3 hypersensitivity. So it's an interesting report. But
4 I don't think that it has much of an impact on the
5 weight of the evidence on this topic.

6 MR. SHADRACK: Q: Are you familiar with a Dutch study
7 from -- which was released in April of 2012?

8 DR. BAILEY: A: If you could give me a reference, or a
9 copy of the paper, I'd be happy to tell you.

10 MR. SHADRACK: Q: Yeah. It's called "Knowledge note:
11 health complaints of electromagnetic fields".

12 DR. BAILEY: A: That's not enough information for me to
13 go on, sir. Could you show me the document?

14 MR. SHADRACK: Q: Okay. No, I can't. I found it --

15 DR. BAILEY: A: Do you have the authors?

16 MR. SHADRACK: Q: It's just called "Knowledge note".
17 It's a document put out by the Dutch government.

18 DR. BAILEY: A: I don't think that I've seen it from
19 what you've been able to tell me about it.

20 MR. SHADRACK: Q: Okay. I found it yesterday while --
21 at page 29 it reports that some studies have found two
22 to three percent of the population in the study that
23 can tell when EMF happens.

24 DR. BAILEY: A: Sir, I can respond to that. Thank you.
25 There have been a number of surveys that have been
26 conducted, much in the way that we surveil about many

1 things of interest in our society, about asking people
2 whether they send out a questionnaire and ask them
5 whether they have symptoms of electrical
4 hypersensitivity. And I think that kind of statistic
5 that you've quoted, of two or three percent, is
6 something that is coming from those kinds of surveys,
7 where people have self-reported to a questionnaire
8 that -- as to the prevalence of this concern in the
9 population.

10 MR. SHADRACK: Q: I want to correct you on that. What
11 I saw was that they've done double-blind studies, and
12 that's what they've -- and I don't want to belabour
13 this point, but would you agree -- you've have said
14 there is no evidence, in your testimony.

15 DR. BAILEY: A: I did not say that, sir. I said -- my
16 evidence is that having all of this research that's
17 been done, like the World Health Organization, we
18 can't conclude that there is a causal link between
19 exposure to radio frequency fields and electrical
20 hypersensitivity symptoms.

21 I didn't say that there was no research on
22 this topic. I said that if you evaluate all of the
23 research, there is not a causal relationship.

24 MR. SHADRACK: Q: Well, I didn't say -- I'm not asking
25 about whether there's any research. What I'm asking
26 you is, you have said -- and I don't want to -- have

1 you say that there is no evidence for -- on
2 hypersensitivity.

5 MR. MACINTOSH: I think the conversation has been a bit
4 more nuanced than that, Mr. Chair, and it's a couple
5 of times it's been asked and answered. It's not as if
6 no one has ever put pen to paper with such a
7 conclusion thus far, if I can summarize. Dr. Bailey
8 has said that the weight of scientific evidence in his
9 opinion is not leading to the conclusion that there is
10 the linkage between EHS and RF.

11 It's a little bit -- it's nuanced. But
12 it's a different thing.

13 THE CHAIRPERSON: Yes. I think you've had the question
14 answered. If you'd like to re-pose the question in a
15 different manner, considering the points that -- the
16 comments that Mr. Macintosh has made, then we will
17 certainly permit another question. But I think you've
18 had an opportunity to ask many questions on the same
19 topic.

20 MR. SHADRACK: Q: I put it to you, Dr. Bailey, that
21 this document in front of us--

22 THE CHAIRPERSON: Now, which document are you talking
23 about?

24 **Proceeding Time 10:47 a.m. T27**

25 MR. SHADRACK: Q: The American Academy of Environmental
26 Medicine. Is a reasoned argument by a group of

1 physicians who work in the environmental field of
2 medicine. If you look at both papers, would you agree
3 that what they're saying is "We're treating more and
4 more people who say they have this sensitivity"?

5 DR. BAILEY: A: I get -- I understand that from that
6 document, yes.

7 MR. SHADRACK: Q: And in that sense would you concur
8 that they're following the WHO document from 2005?

9 DR. BAILEY: A: In providing treatment to their
10 patients, I assume that they are.

11 MR. SHADRACK: Q: Would you agree that they are trying
12 to help those patients live in the world and try and
13 live as normal a life as possible, given the
14 condition?

15 DR. BAILEY: A: I would assume so.

16 MR. LOSKI: A: If I could add, Mr. Shadrach, certainly
17 from our perspective going to the WHO document that
18 you just referenced, in that same subheading under
19 "Physicians", in the first paragraph it states that:

20 "Treatment of affected individuals should
21 focus on the health symptoms in the clinical
22 picture and not on the person's perceived
23 need for reducing or eliminating EMF in the
24 workplace or home."

25 MR. SHADRACK: Q: Dr. Bailey, are you aware of the work
26 of Dr. Rea?

1 DR. BAILEY: A: Yes, I am.

2 MR. SHADRACK: Q: Is it not true that he runs the
3 Environmental Health Centre in Dallas?
4 DR. BAILEY: A: I understand that, yes.

5 MR. SHADRACK: Q: And he is a -- he was at one point
6 head of surgery of one of the Texas hospitals?
7 DR. BAILEY: A: I'm not aware of that, but that's --

8 MR. SHADRACK: Q: So he spent years working on
9 environmental medicine issues. Do you understand that
10 to be the case?
11 DR. BAILEY: A: Yes.

12 MR. SHADRACK: Q: So given his clinical experience and
13 what he's trying to do, I put it to you that you are
14 making a biased statement between 17 and 24 on page
15 496.

16 MR. WARREN: A: Sorry, page 497?

17 MR. SHADRACK: Q: 496.

18 DR. BAILEY: A: Well, let's take the position that
19 you've commented on from Dr. Rea. You know, his
20 opinion has been out for a long time, since 1991, and
21 a number of different agencies have reviewed it. For
22 instance, the World Health Organization in their
23 reviews, the California Department of Health Services
24 have it scientifically wanting. So I don't feel that
25 by doing an evaluation of that study that that's bias
26 if I find the study wanting, as have other health and

1 scientific agencies.

2 MR. WARREN: A: And I note again and I think Mr. Loski
3 has already said this twice, but that even -- that Dr.
4 Bailey's opinion is shared by the WHO. It's also
5 shared by one of the intervener witnesses, Dr.
6 Carpenter.

7 **Proceeding Time 10:52 a.m. T28**

8 MR. SHADRACK: Q: Okay. But this is a document put out
9 by a group of physicians who have experience in
10 treating people with a variety of environmental
11 illnesses, including electromagnetic sensitivity.

12 DR. BAILEY: A: I understand that, sir, but working to
13 alleviate the symptoms of their patients is not the
14 same thing as having the expertise to necessarily
15 determine from scientific research what the origin of
16 those complaints are. And I would argue that
17 scientific research rather than just clinical opinion
18 is required to establish a causal link between radio
19 frequency field exposure in the everyday environment
20 and these symptoms.

21 DR. SHKOLNIKOV: A: I would like to add, and this is
22 not as a biologist but as a physicist, if you look on
23 page 3 of the document --

24 MR. SHADRACK: Q: Which document?

25 DR. SHKOLNIKOV: A: -- there are two -- oh, the AAEM --
26 this is the press advisory, April 12th, 2012. This is

1 the paragraphs that start with "Although the studies
2 clearly show causality and disprove the claim" and
5 then it goes on to discuss Newtonian classical and
4 other physics. I don't know if you have --
5 MR. SHADRACK: Q: Okay. Page -- which page?
6 DR. SHKOLNIKOV: A: It's page 3.
7 MR. SHADRACK: Q: Yes, okay.
8 DR. SHKOLNIKOV: A: I've been doing research in my
9 Ph.D. on exactly the topics and even cited the papers,
10 some of the papers in this report, on -- the
11 scientific papers. And I would say those two
12 paragraphs are, from physics point of view, are
13 complete nonsense. They make no -- they are
14 completely inconsistent with the terminology even that
15 those people are using. The physics they're
16 discussing just don't make any sense. It's really
17 similar to reading a pseudo-scientific document. I
18 mean, I'm not going to talk about the biology. But
19 just based on the physics point of view, thermal
20 bioeffect they're describing requires you to be at
21 temperatures at which -- that are so low that the last
22 thing the patient would have to worry about is radio
23 frequency exposure, because they'd be cryogenically
24 frozen. And similar things to other topics.
25 So, you know, I haven't addressed this in
26 E*Ponent Report, but now that you have shown to me and,

1 you know, based on my experience of six years of in-
2 depth research, four years of education, and as a
3 referee on *Physical Review Letters*, which is one of
4 the top journals in physics, if somebody had submitted
5 such a claim to this journal, it would be dismissed
6 without argument, I believe, of any referee or
7 editorial, just due to lack of plausibility and even
8 basic understanding of the concepts involved.

9 MR. SHADRACK: Q: And yet, if I understand what you're
10 talking about, it's cited as 26 and 27, would you
11 agree?

12 DR. SHKOLNIKOV: A: Yes. And I would also note that
13 those are not -- considering they're discussing
14 physics topics, I would pose to you the *Journal of*
15 *Alternative and Complementary Medicine* is not a
16 physics journal. So if somebody were to posit that
17 something in biological system violates a fundamental
18 law of physics, then an appropriate venue and a
19 discussion forum wouldn't be a biology journal,
20 because people who would posit it would get a Nobel
21 Prize in physics and should have submitted it to a
22 more prestigious venue.

23 MR. SHADRACK: Q: Twenty-seven is, as I understand it,
24 Highland and Rowlands are the editors. Fröhlich, in a
25 book published by the University of Liverpool. And
26 it's in theoretical physics. So, it's not as if it's

1 than in the 19th century was because at normal room
2 temperature these effects cannot be observed because
5 they're overwhelmed by basic radio frequency and other
4 thermal noise in the environment. And that's my
5 point. The language makes it sound like it's a
6 plausible argument, but it is not -- you know, there
7 are a few things you can talk in certainty about, but
8 the topics discussed in these paragraphs are
9 demonstratively false. So they're not even an
10 opinion, they're a fact, and I would ask you to
11 actually talk to the authors of the papers they cite,
12 on Aharonov-Bohm effect and Josephson Junction, and
13 some of those I would venture you can actually talk to
14 because they're still around and I have talked to some
15 of them, and I would pose to them these two paragraphs
16 and I would actually ask you to, you know, if you are
17 interested to ask the physicists who have developed
18 the theories whether they agree in those two
19 paragraphs, and the argument -- you know, the answer
20 is absolutely no.

21 I mean, this is first year of graduate
22 school, this is a topic that is covered in the field
23 I'm in. I mean we're talking even research. Just
24 basic knowledge in these areas of physics.

25 MR. SHADRACK: Q: Fair enough. But Dr. Bailey, would
26 you not agree that references to bioelectromagnetic

1 The other reference number 10 is a study of
2 -- by Henry Lai, "Magnetic-field-induced DNA strand
3 breaks in the brain cells of rates". And if I recall
4 that particular study, it was done with extremely low
5 frequency magnetic fields, not radio frequency fields.
6 And again, neither of those *in vitro* studies, to my
7 knowledge, have anything to do directly with these
8 diseases.

9 So I don't know how the writers of this
10 document took two studies of *in vitro* observations on
11 cells and then all of a sudden jumped to the
12 conclusion that radio frequency fields were the cause
13 of Alzheimer's, Parkinson's, and amyotrophic lateral
14 sclerosis.

15 MR. SHADRACK: Q: Okay. All right. Let's move on,
16 then.

17 Let's go to page 498. Lines 16 to 22. And
18 you're again referring to this document that Mr. Miles
19 put in evidence. And you're talking about various
20 national and international agencies. Now, are you
21 aware that in Sweden and Spain hypersensitivity is now
22 recognized as a disability?

23 DR. BAILEY: A: I understand that in Sweden, that there
24 is accommodations to people with these symptoms. I do
25 not know anything about Spain.

26 MR. SHADRACK: Q: Okay. So there are -- there is -- we

1 are agreed there is at least one country now that's
2 moved to recognize hypersensitivity, in Europe.

5 DR. BAILEY: A: I understand that they have a program
4 or some kind of system for addressing the issues faced
5 by persons who have symptoms of electrical
6 hypersensitivity. That's not the same thing as saying
7 that the Swedish health authorities have concluded
8 that radio frequency fields are the cause of those
9 symptoms.

10 MR. SHADRACK: Q: Okay. But again, is it not true --
11 this is the question I put to you. I didn't ask you
12 whether they found the causality link, I said do they
13 recognize it and allow people to have -- be on a
14 disability pension with that particular medical
15 condition?

16 MR. MACINTOSH: That's not quite what was asked and
17 answered, but I don't object to it being asked now.

18 DR. BAILEY: A: It would appear that's the case.
19 Obviously I don't have all of the details about the
20 Swedish policy, so I can't go any further than that,
21 but it appears that they're making some accommodation
22 to people with these complaints.

23 MR. SHADRACK: Q: At page 508, you say there is uniform
24 agreement on this issue.

25 THE CHAIRPERSON: Can you give us a line on --

26 MR. SHADRACK: Q: Sorry, Mr. Chair. I'm looking at --

1 let's say we start at line 10 and we go down to line
2 14.

5 **Proceeding Time 11:06 a.m. T31**

4 THE CHAIRPERSON: Thank you.

5 MR. SHADRACK: Q: Are you saying that there -- you've
6 alternated between consensus, here you say uniform.
7 Am I correct? In your testimony so far you've said
8 uniform or consensus around this issue.

9 DR. BAILEY: A: Well, looking at page 508, lines 11 and
10 12, I stated:

11 "...and I think there is pretty much uniform
12 agreement in the scientific community as
13 summarized in the health reviews that I
14 discussed in our report..."

15 MR. SHADRACK: Q: Okay.

16 DR. BAILEY: A: So let's take that.

17 MR. SHADRACK: Q: Are you familiar with the
18 organization The International Commission on
19 Electromagnetic Safety? It was founded in Venice in
20 2002.

21 DR. BAILEY: A: I am.

22 MR. SHADRACK: Q: Okay.

23 DR. BAILEY: A: Yes.

24 MR. SHADRACK: Q: Are you aware that they held a
25 symposium in June of 2008? I believe it was in
26 Venice.

1 DR. BAILEY: A: Yes.

2 MR. SHADRACK: Q: Okay. Are you aware of the statement
5 that have publicly on their website?

4 DR. BAILEY: A: I've seen the statement. Whether it's
5 exactly the same one that's on the website or not I
6 couldn't be sure, but --

7 MR. SHADRACK: Q: Okay.

8 DR. BAILEY: A: It's probably the same thing.

9 MR. SHADRACK: Q: Okay. So "We recognize," this is
10 from part of their statement:

11 "We recognize the growing public health
12 problem known as electro hypersensitivity,
13 that this adverse health condition can be
14 quite disabling."

15 So is there not a body of opinion in the
16 scientific community that says to the contrary of what
17 you say?

18 DR. BAILEY: A: I don't think that statement
19 contradicts my testimony, sir. I believe that what I
20 stated is that no scientific or health agencies had
21 recognized a causal relationship between exposure to
22 radio frequency fields and electro hypersensitivity
23 symptoms.

24 MR. SHADRACK: Q: But --

25 DR. BAILEY: A: There may be, as you indicated, from
26 this group, much like the Bioinitiative report, there

1 are scientists who have a different opinion, but that
2 is not the opinion of the national and international
5 health agencies.

4 MR. SHADRACK: Q: But is it not true what you've just
5 stated is contrary to what you stated on page 508?
6 You said there was uniform agreement in the scientific
7 community. There isn't.

8 DR. BAILEY: A: Sir, if you go back to lines 12 and 13
9 it says:

10 "Pretty much uniform agreement in the
11 scientific community as summarized in health
12 reviews that I discussed in our report."

13 I did not say the entire scientific community of the
14 world. I was talking about those agencies that have
15 the responsibility for identifying and protecting
16 public health with regard to radio frequency fields.
17 And I certainly acknowledge that there are other
18 people who are appearing as witnesses in this hearing
19 who have a different opinion.

20 MR. SHADRACK: Q: Thank you. In conclusion on this
21 topic, in your discussion with Mr. Miles, he
22 specifically asked about his spouse's condition.

23 **Proceeding Time 11:11 a.m. T32**

24 DR. BAILEY: A: Yes.

25 MR. SHADRACK: Q: Would you agree that there are
26 scientists and physicians who would disagree with your

1 conclusion?

2 DR. BAILEY: A: What do you understand my conclusion to
5 be, sir?

4 MR. SHADRACK: Q: Well, he asked whether it was safe --

5 THE CHAIRPERSON: Are you able to give us a page
6 reference, Mr. Shadrack? It would be helpful.

7 MR. SHADRACK: Q: Okay, there are a number of
8 references. Let's look at page 512 and I'm looking at
9 lines 12 to 19. That's one reference.

10 DR. BAILEY: A: On page 512, okay.

11 MR. SHADRACK: Q: I mean there's a series of responses
12 that you make. I also say concurrent with this, and I
13 don't want to -- 513, 11 to 21, and I think -- what
14 I'm putting to you is that you've said, no, there are
15 no concerns, you shouldn't have any concerns with the
16 smart meter.

17 DR. BAILEY: A: Sir --

18 MR. SHADRACK: Q: Yeah.

19 DR. BAILEY: A: I have no control what people's
20 concerns may or may not be. All I can do is to tell
21 you that from a scientific perspective I don't see the
22 evidence to suggest harm or hazard.

23 MR. SHADRACK: Q: I understand that, but what I'm
24 asking you is, in relation to the opinion you gave,
25 are there scientists and are there doctors who would
26 disagree with the opinion you gave?

1 DR. BAILEY: A: Sir, you'd have to put it to me of
2 those opinions. I just, you know, I have no idea what
3 thoughts people might have or opinions they might have
4 about this topic. I do know that this is -- with
5 regard to the condition asked about, that there has
6 been research on this. There was an investigation
7 done as part of a cohort study that looked at multiple
8 sclerosis, and one study they found no association
9 with the use of mobile phones, and in a later study
10 they came back again --

11 MR. SHADRACK: Q: I'm not asking, I'm not asking about
12 mobile phones. At 11:11 -- yes, 11:11 and we don't
13 need to go there, Mr. Miles specifically stated he has
14 a concern because the smart meter is on his bedroom
15 wall of his house, that his wife's condition will be
16 impacted by having the smart meter put there. And I'm
17 simply asking you the question in relation to your
18 responses to Mr. Miles on that topic, are there
19 scientists and doctors who would disagree with your
20 opinion?

21 MR. MACINTOSH: The way this worked, Mr. Chair, with
22 respect, he put this to Dr. Bailey and Dr. Bailey,
23 "Well, before you ask me to say whether I'm differing
24 from another person on my opinion, what opinion is it
25 that you're attributing to me?" and that has not been
26 addressed yet. And in fairness, Dr. Bailey should be

1 asked, you know, what is his opinion and what is the
2 opinion before there can be a proper contrast.

5 THE CHAIRPERSON: Do you have any response to that
4 concern, Mr. Shadrack?

5 MR. SHADRACK: I'll try and rephrase the question, Mr.
6 Chair.

7 THE CHAIRPERSON: Okay, and I'm just going to interrupt
8 for a second here as well. I asked you earlier to
9 take us to the specific pages that you were referring
10 to.

11 MR. SHADRACK: Yes.

12 THE CHAIRPERSON: Because I think it's very important.
13 And I mentioned this to you and I think it's important
14 for everybody. I want to be fair to everybody who's
15 going to be -- who has and who's going to be cross-
16 examining, that we have to be specific, we have to ask
17 specific questions. And so I would ask you to take us
18 to the specific references and then ask a focused
19 question of the panel.

20 MR. WARREN: A: Mr. Shadrack, I have some specific
21 information -- you had asked about the recognition of
22 electro hypersensitivity in Sweden. I have some
23 information from an information request.

24 THE CHAIRPERSON: Could we come back to that?

25 MR. WARREN: A: Absolutely.

26 THE CHAIRPERSON: Because we have a question at play

1 THE CHAIRPERSON: Please speak into the microphone. I'm
2 having difficulty --

5 MR. SHADRACK: Q: I have put into evidence --

4 THE CHAIRPERSON: I'm not trying to make things difficult
5 for you.

6 MR. SHADRACK: No no.

7 THE CHAIRPERSON: It's just important that we have this
8 properly recorded.

9 MR. SHADRACK: Fair enough.

10 Q: I put into evidence at 13-17-1 a DVD 27, a tape
11 of Dr. Klinghart. Have you seen that tape?

12 DR. BAILEY: A: I have not, sir.

13 MR. SHADRACK: Q: Okay, all right. I'll simply submit
14 that Dr. Klinghart is of a different opinion, in terms
15 of -- I'll leave it at that.

16 THE CHAIRPERSON: Mr. Warren, did you have a comment you
17 wanted to make that would be helpful?

18 MR. WARREN: A: It's certainly up to you, and I
19 apologize for interrupting. I thought Mr. Shadrack
20 had abandoned that line of questioning.

21 THE CHAIRPERSON: Okay, thank you.

22 MR. SHADRACK: Q: Well, I want to move on. I have one
23 more -- I want to go back to page 23.

24 DR. BAILEY: A: Of what report, sir?

25 MR. SHADRACK: Q: Of the E^xponent Report. A number of
26 reports are cited by Hardell, and then it goes on to

1 say that there's a critique of Hardell. And it talks
2 about no specified minimum period of use. Now, isn't
5 it true -- my understanding is that Hardell found a
4 correlation.

5 **Proceeding Time 11:21 a.m. T34**

6 DR. BAILEY: A: He did report a correlation.

7 MR. SHADRACK: Q: Okay.

8 DR. BAILEY: A: And we've described that.

9 MR. SHADRACK: Q: Now, you say there's no amount --
10 there's no proper description of time of -- minimum
11 time of use of a cordless phone or cell phone. Am I
12 correctly understanding that?

13 DR. BAILEY: A: There were unclear exposure
14 definitions, and hence selection results from
15 overlapping studies. The other thing to recognize is
16 that I was cross-examined about the comments by Ahlbom
17 and Swerdlow, these expert panels, about those
18 studies. There are other studies that were -- other
19 criticisms that were leveled against the study in that
20 in that same time period, by the National Radiological
21 Protection Board of Great Britain, by the Swedish
22 Irradiation Protection Institute, by a number of other
23 scientists, including Professor Rothman, who is
24 arguably one of the most famous epidemiologists in the
25 world, and his text book is a standard use in
26 epidemiology. So, there are multiple criticisms that

1 have been available about this. And the way to
2 resolve these issues that have been raised about the
5 study is to -- for Dr. Hardell to do this kinds of
4 things that the Interphone investigators did in their
5 study, in which they made available a whole host of
6 supplementary analyses to help us understand issues
7 that had arisen in conjunction with the Interphone
8 study. But I haven't seen that with regard to the
9 Hardell group of studies.

10 MR. SHADRACK: Q: But I mean, one of the things I see
11 here is that Hardell's finding a relationship. Then
12 if there's no minimum amount specified, then isn't
13 there more reason for concern? I mean, he's finding
14 -- he's clearly finding over a long-term period that
15 there is a relationship, right?

16 DR. BAILEY: A: That is what he is reporting for --

17 MR. SHADRACK: Q: That's what he's reporting.

18 DR. BAILEY: A: -- from his data set.

19 MR. SHADRACK: Q: And one of the critiques is that he
20 didn't talk about minimum or maximum, and I'm saying,
21 he's found the relationship. That's important, in
22 terms of long-term use. Isn't that --

23 DR. BAILEY: A: There are many --

24 MR. SHADRACK: Q: Isn't it -- isn't it a bit of a
25 strange critique -- sorry, I didn't mean to interrupt
26 you.

1 DR. BAILEY: A: Any time an epidemiology study, or for
2 that many experimental study is done, there are
5 strengths and weaknesses. There are areas where
4 people have questions to try and understand exactly
5 how the study was done, and to -- and part of that is
6 to enable to determine how similar the results may be
7 to other studies.

8 So a lack of transparency is, some times --
9 and if you look through reviews by, for instance the
10 AGMAR in their 2012 report, they will comment about a
11 study that the details about some aspect of it, it
12 could be the exposure or how the cases were selected
13 or so on, was not sufficiently described for them to
14 fully evaluate it, and the inference is that therefore
15 they're going to place less weight on that data, as
16 opposed to a study that is totally transparent as to
17 the methodology.

18 MR. SHADRACK: Q: But are you familiar with who Leonard
19 Hardell is?

20 DR. BAILEY: A: Yes.

21 MR. SHADRACK: Q: He's an oncologist, isn't he?

22 DR. BAILEY: A: Yes.

23 MR. SHADRACK: Q: From the medical school, I think in
24 Orebro in Sweden?

25 DR. BAILEY: A: Sounds correct.

26 **Proceeding Time 11:26 a.m. T35**

1 MR. SHADRACK: Q: So he's a specialist in cancer.

2 DR. BAILEY: A: Yes.

5 MR. SHADRACK: Q: So when a specialist in cancer comes
4 up with a study, even with its weaknesses, should we
5 not put a preponderance of weight on that study?

6 DR. BAILEY: A: Sir, we evaluate scientific studies by
7 the data that are contained in them and the methods
8 that arrive at the data and not the resumes of the
9 people who did the study. For instance, when we
10 review scientific papers for a journal, a number of
11 journals have a policy of hiding the identities of the
12 authors of the study, so that the reviewers will not
13 know who the authors are --

14 MR. SHADRACK: Q: But Hardell didn't do that, did he?

15 DR. BAILEY: A: Excuse me, sir. Can I complete my
16 response? And so we don't evaluate scientific
17 research by the CVs of the authors. We evaluate the
18 research and the data that's obtained. And I gave the
19 example from peer review of scientific research for
20 some journals, where they take explicit steps to
21 prevent knowledge about a person's position or CV or
22 expertise from entering into their scientific
23 evaluation of the evidence.

24 MR. SHADRACK: Q: But we agreed earlier, when we
25 started out this exchange or cross-examination, that
26 in terms of peer review it's really important that the

1 peers doing the review have the knowledge and
2 experience. So surely it is other oncologists that
3 should look at what Dr. Hardell is saying and not
4 people outside of his field. Is that not important in
5 scientific discovery?

6 DR. BAILEY: A: Sir, one could make the argument that
7 oncologists, just as a group, would probably not be
8 the right group to evaluate Dr. Hardell's research for
9 the reason that most oncologists are not involved in
10 conducting and evaluating epidemiology studies.
11 They're more involved in perhaps in treating patients
12 or evaluating genetic characteristics of tumours or of
13 the histopathology of tumours, whatever, and so the
14 reviewers -- since this is an epidemiology study,
15 among the many reviewers of it, by health agencies and
16 the general scientific community, would include a far
17 wider range of scientists than just oncologists.

18 MR. SHADRACK: Q: Are you familiar with the story of
19 Dr. John Snow?

20 DR. BAILEY: A: Yes.

21 MR. SHADRACK: Q: He was a medical doctor, wasn't he?

22 DR. BAILEY: A: He was.

23 MR. SHADRACK: Q: And wasn't he the doctor that
24 discovered the origins of -- or at least how cholera
25 was transmitted?

26 DR. BAILEY: A: Sir, I don't have -- I'm not disputing

1 what happened, but -- are you familiar with that case
2 and --

5 DR. BAILEY: A: Only what I saw in a newspaper article.

4 MR. SHADRACK: Q: Okay. So in relation to the issue of
5 cancer with cell phone use from a long-term, we have a
6 growing body of evidence on it. Would you not agree?

7 DR. BAILEY: A: I would not agree that the document you
8 just -- the court decision you just described would
9 necessarily be part of that body of scientific
10 evidence. And I would say that we have a lot more
11 information today about the potential effects of radio
12 frequency fields than we've ever had, and that has
13 still not changed the consensus of public health
14 agencies.

15 MR. SHADRACK: Q: My last question. Would you agree
16 that there are two opinions of thought? You are on
17 one pole, and there are others in the scientific
18 community and in positions who are on another pole
19 around the concerns around electromagnet sensitivities
20 and health concerns.

21 DR. BAILEY: A: I understand that there is a difference
22 in opinion among some of the different groups that you
23 mentioned today, and among witnesses to this hearing.

24 MR. SHADRACK: Q: Yes. Thank you very much.

25 THE CHAIRPERSON: Thank you. Mr. Fulton, who is our next
26 cross-examiner?

1 MR. FULTON: I believe it's Mr. Bennett.

2 THE CHAIRPERSON: Okay, we'll call Mr. Bennett, then.

5 Okay, Mr. Bemister has been dispatched to find Mr.

4 Bennett.

5 I will just comment that we will break at
6 twelve o'clock, and that one of the panel members has
7 some other Commission business to attend to, by way of
8 a conference call that's been scheduled shortly after
9 twelve o'clock. So we will break at twelve o'clock.

10 MR. BENNETT: I was actually having a little bit of a
11 computer difficulty and my little antique doesn't have
12 that forever cordless capabilities. So, Mr. Fulton,
13 do we have a power cord under there? Mr. Bemister?

14 **Proceeding Time 11:35 a.m. T37**

15 THE CHAIRPERSON: While you're getting prepared, Mr.
16 Bennett, I'll just ask you if you heard my comments,
17 oh, half an hour or so ago. And I was talking
18 specifically to Mr. Shadrack, but generally to others
19 that will be cross-examining, and that is to please,
20 if you're referring to a document, please be specific
21 about the document and the passage in the document
22 that you're referring to, and then ask questions that
23 are focused rather than of a general nature.

24 MR. BENNETT: And I want to thank you for that and I want
25 to thank you guys for the education, because as you
26 know, you've informed me several times about process.

1 I've tried to just keep that in mind so we can just do
2 a good job for you.

5 THE CHAIRPERSON: We do appreciate that many of the
4 interveners are not experienced in appearing before
5 the Commission, and I'm afraid that at times it sounds
6 like we may be being a little tough. But we're really
7 just trying to be fair and to be information as well,
8 so --

9 MR. BENNETT: I actually commented to my family yesterday
10 that all of you must be parents to have the patience
11 that you do.

12 THE CHAIRPERSON: Some of us are even grandparents.

13 MR. BENNETT: I can understand that. Are we ready to
14 proceed right now?

15 THE CHAIRPERSON: Yes, please do.

16 **CROSS-EXAMINATION BY MR. BENNETT:**

17 MR. BENNETT: Q: I just want to start with Mr. Warren.
18 Mr. Warren, you're an engineer?

19 MR. WARREN: A: Yes.

20 MR. BENNETT: Q: What's your engineering specialty?

21 MR. WARREN: A: I have a degree in engineering physics
22 with a mechanical specialty.

23 MR. BENNETT: Q: So is that mechanics relating to HVAC
24 equipment? Or --

25 MR. WARREN: A: Not specifically, but I have some
26 experience in that area.

1 MR. BENNETT: Q: Do you guys carry professional errors
2 and omissions insurance as an engineer?

5 MR. WARREN: A: I personally don't have any, no.

4 MR. BENNETT: Q: Okay, and the reason we get this to
5 is, you know, engineering is an exact science. You
6 know, we don't send somebody up on an elevator and
7 have a sign up there that says Good Luck. You know,
8 everything's there for particular reasons.

9 Engineering is an exact science. And Mr. -- can you
10 say your name again, please?

11 DR. SHKOLNIKOV: A: You can actually just call me
12 Doctor if that saves you the time.

13 MR. BENNETT: Q: If I say just Doctor that's fine?

14 DR. SHKOLNIKOV: A: Yes.

15 MR. BENNETT: Q: I'll just refer to you -- and the same
16 thing for you. As an electrical professional in this
17 end, electricity is an amazing and exact science. It
18 shocked the heck out of me to go through that
19 education and see how exact it was, you know,
20 literally counting electrons passing a given point to
21 product electricity. You'd agree with that, wouldn't
22 you? It's more than peer-reviewed science, of course.

23 DR. SHKOLNIKOV: A: Well, I would say electrical
24 engineering is engineering discipline that is based on
25 science but it is engineering.

26 MR. BENNETT: Q: Yes, yes. Do you as a professional

1 engineer carry errors and omissions insurance?

2 DR. SHKOLNIKOV: A: Because I work in a professional
5 firm, I believe the issue of insurance is handled by
4 my firm, but I comply with -- but my firm makes sure
5 that I comply with all the engineering regulations.

6 MR. BENNETT: Q: Okay. Does that also include -- would
7 that also include in your participation with the
8 E^xponent Report?

9 DR. SHKOLNIKOV: A: All my work is under the firm. I'm
10 not sure if -- I'm not sure if this specific work,
11 because it wasn't sealed and stamped, would fall under
12 the specific regulations for engineering because the
13 issues of safety in this specific case were already
14 addressed by a national agency.

15 MR. BENNETT: Q: Yes.

16 DR. SHKOLNIKOV: A: But all my work is -- as a
17 professional work I believe is covered by my company's
18 policies and they comply with the regulations of
19 whatever jurisdiction they're in.

20 MR. BENNETT: Q: Would you agree that if electrical
21 information was kept from you, not intentionally, as
22 an electrical engineer, that that would change a
23 consultation in this report? If that's the case.

24 DR. SHKOLNIKOV: A: It will be my duty as a licensed
25 engineer to revise any opinion if the information
26 pertinent to health and safety of the population were

1 to be involved.

2 MR. BENNETT: Q: I appreciate that and respect that.

5 Now, Mr. Loski, was the ordering of the
4 E^xponent Report specific to addressing the AMI project
5 being compliant with Safety Code 6 and any potential
6 health effects? That was the purpose of the report,
7 which is just to deal with that issue, and I've heard
8 this many times throughout here that that's what we go
9 with. Is that correct?

10 MR. LOSKI: A: That is correct.

11 DR. SHKOLNIKOV: A: Okay, and has the specific
12 absorption rate been adopted internationally for
13 limits of human exposure to radio frequency EMFs?

14 DR. SHKOLNIKOV: A: The answer is a little bit more
15 nuanced. Depending on the device and depending on
16 what you mean by adapted and definitions, the answer
17 would vary by jurisdiction. If you're talking about
18 legal requirements and -- or regulatory requirements,
19 and depending on the scientific question at hand.

20 **Proceeding Time 11:40 a.m. T38**

21 MR. BENNETT: Q: About just the science aspect of it.
22 You know, in order for anything to be happening, you
23 have to have the radio frequency MFs being absorbed or
24 interacting with tissue. So there has to be some
25 scientific process to validate that?

26 DR. SHKOLNIKOV: A: If you please -- are you

1 specifically referring to the AMI, the advanced
2 meters?

5 MR. BENNETT: Q: No, I'm referring to the whole
4 process. Health Canada uses Safety Code 6. Health
5 Canada uses the specific absorption rate.

6 DR. SHKOLNIKOV: A: I would say that Health Canada,
7 Safety Code 6, depending on which frequency you're
8 looking at, and depending on the distance, specifies
9 different requirements.

10 MR. BENNETT: Q: Not the distance. We'll get into the
11 distance part of it later. But they use a specific
12 absorption rate.

13 DR. SHKOLNIKOV: A: No, I believe for low frequencies
14 they use -- they also use specifically electric and
15 magnetic fields separately for issues of compliance.

16 MR. BENNETT: Q: And where does this -- these
17 frequencies fall within what range of that?

18 DR. SHKOLNIKOV: A: Well, that's why I've asked you to
19 specify whether we're working --

20 MR. BENNETT: Q: Well, with the smart meter program.

21 DR. SHKOLNIKOV: A: For the smart meter program, there
22 are -- you can do an analysis with respect to either
23 specific absorption rate or maximum permissible
24 exposure.

25 MR. BENNETT: Q: Now, isn't a specific absorption rate
26 in effect validating that tissue is being

1 electromagnetically induced? That's how the
2 frequencies would have to interact with the tissue to
3 heat it.
4 DR. SHKOLNIKOV: A: I don't believe that is a -- I
5 mean, the statement is in Safety Code 6 --
6 MR. BENNETT: Q: Not related to Safety Code 6, excuse
7 me.
8 THE CHAIRPERSON: Please let --
9 MR. BENNETT: I'm sorry. Sorry.
10 THE CHAIRPERSON: Let the expert answer your question.
11 DR. SHKOLNIKOV: A: So, and maybe this is a point where
12 I can explain a little bit about how this different --
13 if it would please the Commission, I can give a little
14 bit more detail about what all the different units
15 are. Because if this -- I believe that this will
16 continue -- you know, this will continue. I can spend
17 about two minutes to explain the terminology if it
18 would please the Commission.
19 THE CHAIRPERSON: Well, if that would help us understand
20 the line of questioning, if there is -- if you can
21 provide a technical overview, that would perhaps be
22 helpful, yes.
23 MR. BENNETT: And just -- can I just --
24 THE CHAIRPERSON: But then I don't want to forget the
25 question.
26 DR. SHKOLNIKOV: A: Yes. And I will --

1 MR. BENNETT: Q: And again, I'm just referring to a
2 mechanism of action. Something has to heat it.
5 That's all.

4 DR. SHKOLNIKOV: A: So, there is a specific absorption
5 rate which is a dosage -- measure of dosage. How much
6 energy is absorbed in a human body. Based on those
7 constraints, Safety Code 6 has devised a method which
8 is shared by other regulatory agencies such as FCC and
9 IEEE, for example, as a standard, that says that if
10 you limit the maximum permissible exposure or the
11 power density is a way of measuring it, below a
12 certain level you are not going to exceed the specific
13 absorption rate in a body. So therefore for a large
14 class of devices, Safety Code 6 says that by complying
15 with power density measures you are guaranteeing that
16 specific absorption rate in a human body will not be
17 exceeded. And that's a relationship between these two
18 quantities.

19 MR. BENNETT: Q: Now that you're bringing that up,
20 what's the --

21 THE CHAIRPERSON: No, let's go back to the question,
22 okay?

23 MR. BENNETT: Well, no, he actually did answer the
24 question.

25 THE CHAIRPERSON: Okay.

26 MR. BENNETT: Q: And the reason he answered the

1 question is, you have to have a mechanism of action to
2 heat tissue, to discuss this Code-related issue. So
5 when he talked about absorption and the frequencies
4 being absorbed, this is just an important issue for
5 you to look at with this.

6 Q: Now, with regards to that, what is the allowable
7 exposure for smart meter frequencies? How much a day?

8 DR. SHKOLNIKOV: A: Sorry, you're asking what's
9 exposure allowed --

10 MR. BENNETT: Q: Exposure levels for humans from smart
11 meters.

12 DR. SHKOLNIKOV: A: In a period of 6 minutes, the
13 allowed exposure limit is 6 watts per metre squared,
14 as averaged over six minutes.

15 MR. BENNETT: Q: Okay. So, what would -- how would
16 that change that if they were actually being exposed
17 24/7?

18 **Proceeding Time 11:45 a.m. T39**

19 DR. SHKOLNIKOV: A: The Safety Code 6, in definitions
20 section defines -- the table that I referred to for
21 the standard defines it as "uncontrolled environment".
22 Where there is an explicit statement that no
23 consideration should be given to the people exposed in
24 ability to mitigate or understand exposure, and
25 therefore no reduction is allowed to assume that
26 people can leave the exposed area, and therefore the

1 exposure calculations should assume that a person will
2 be exposed on continuous or on sustained basis
5 throughout the duration of their exposure and presence
4 in that environment.

5 MR. BENNETT: Q: But 24/7, 365 days a year, does it
6 allow for that?

7 DR. SHKOLNIKOV: A: It basically does not allow you to
8 assume that a person is leaving the exposed area to
9 mitigate their RF exposure. So if you are
10 inaccessible -- you know, if you're in an area where
11 an uncontrolled population can be in 24/7/365, then
12 the answer is yes.

13 MR. BENNETT: Q: Okay. Now, with regards to that as
14 well, now that's also based on, you know, because the
15 smart meter isn't held against the head like a cell
16 phone, is that correct?

17 DR. SHKOLNIKOV: A: The definition of "uncontrolled
18 exposure" does not -- as was earlier pointed out, the
19 Safety Code 6 when it sets exposure does not tell you
20 what device it is serving as an exposure. Depending
21 on the distance of the device, you have a different
22 metric of evaluating the exposure, but the statement
23 about uncontrolled exposure does not care about the
24 distance or any other factors. That is just a
25 definition of who the uncontrolled -- who the
26 population covered under uncontrolled exposure section

1 is.

2 MR. BENNETT: Q: Okay. Now, Mr. Loski, you've referred
5 to the fact that Health Canada specifically says this,
4 that, you know, these meters are considered safer
5 because they're not held against the head.

6 MR. LOSKI: A: I did not say that.

7 MR. BENNETT: Q: Well, I think I can actually refer to
8 the page with this but --

9 MR. LOSKI: A: I can remind you what I said, which was
10 reading from Health Canada document --

11 MR. BENNETT: Q: Volume 3, March 5th.

12 MR. LOSKI: A: I'll reread it then if it needs to -- so
13 from Exhibit B-15, the response to B.C. Hydro No. 2,
14 question 2.4 and Attachment B.C. Hydro 2.4, it states:

15 "Health Canada has concluded that exposure
16 to RF energy from smart meters does not pose
17 a public health risk."

18 MR. BENNETT: Q: Correct, and what's the date of that
19 document please?

20 MR. LOSKI: A: As I mentioned the other day, it's
21 December 2011.

22 MR. BENNETT: Q: Okay, good. I just want you to keep
23 that in mind because we'll be talking about that in a
24 bit. Okay, so -- well, we've already answered one
25 question because, you know, we are talking the
26 frequencies making contact with the body.

1 That electromagnetic induction heating
2 tissue, and the term used for that heating is called
3 watts, a power density, watts per coverage area?
4 DR. SHKOLNIKOV: A: Sorry, to clarify, are you asking
5 me the units of measure of exposure?
6 MR. BENNETT: Q: Yeah. Well, you know, listen, watts
7 as opposed to a power load versus heat.
8 DR. SHKOLNIKOV: A: With respect to the specific
9 absorption rate, the units that are specified as watts
10 of absorbed energy per kilogram of tissue, the units
11 for power density if you are using measuring -- using
12 that metric of exposure are in units of watts per
13 metre squared incident onto the human body.
14 MR. BENNETT: Q: Okay, so when they're talking about --
15 I think the exposure limits are -- am I correct in
16 saying exposure limits are 1,000 microwatts per
17 centimetre squared?
18 DR. SHKOLNIKOV: A: I would have to -- not to do
19 arithmetic here, the units in a standard are in units
20 of watts per metre squared.
21 MR. BENNETT: Q: That's making reference to just heat,
22 correct?
23 DR. SHKOLNIKOV: A: It is making a reference to energy
24 -- I mean the heat is specific terminology, but the
25 answer is on energy. Whether that's heat or not,
26 incident on a human body, as long as that's

1 electromagnetic spectrum energy.

2 MR. BENNETT: Q: Now, is electromagnetic induction
5 considered peer-reviewed science?

4 DR. SHKOLNIKOV: A: I'm sorry?

5 MR. BENNETT: Q: Is electromagnetic induction, is how
6 we create electricity, that's considered beyond peer-
7 reviewed science. We use that to generate
8 electricity.

9 DR. SHKOLNIKOV: A: Electromagnetic induction as used
10 by physicists and by engineers refers to change in
11 magnetic field or geometry for purposes of generating
12 electricity.

13 **Proceeding Time 11:50 a.m. T40**

14 MR. BENNETT: Q: Precisely. But it's a recognized
15 science, correct? Just yes or no is --

16 DR. SHKOLNIKOV: A: Yes, it is recognized that
17 electromagnetic fields can be used to induce electric
18 voltages and currents.

19 MR. BENNETT: Q: That isn't what I asked you. I just
20 asked you if it was recognized as science.

21 DR. SHKOLNIKOV: A: I believe so, yes.

22 MR. BENNETT: Q: Thank you. Now, I asked about Safety
23 Code 6, the limits of a thousand microwatts per square
24 centimetre, and whether you call it heat or what, it's
25 still an electrical load, is that correct? Isn't
26 watts an electrical load?

1 DR. SHKOLNIKOV: A: Actually, I'm going to -- for
2 purposes of -- because I do want to do the conversion
5 correctly for -- I will refer to -- for right now, in
4 terms of --

5 MR. BENNETT: Q: You know, if we're going to take a
6 break, you can even bring that back, if you like.

7 DR. SHKOLNIKOV: A: But I would say --

8 MR. BENNETT: Q: I'm just getting to some bigger points
9 here first.

10 DR. SHKOLNIKOV: A: So the answer is, regardless of
11 units used, at the 900 megahertz, the limits are not
12 the value you have stated. The limits are 6 watts per
13 metre squared.

14 MR. BENNETT: Q: Okay, even six watts, we're talking
15 about an electrical load.

16 DR. SHKOLNIKOV: A: It isn't -- when people refer to
17 electrical load, as electrician, they are talking
18 about a very different concept, which is, if you have
19 an electrical circuit and you put a device in there,
20 such as, for example, the residence, in case of a
21 utility company, that is how much energy usage that
22 device consumes.

23 MR. BENNETT: Q: Yes.

24 DR. SHKOLNIKOV: A: I have never heard the term
25 "electrical load" referred to in an exposure
26 environment.

1 MR. BENNETT: Q: Yeah. I'm just trying to figure out
2 how you're using the terminology "watts". You know,
3 is this like a hundred-watt light bulb burning you?
4 Is this an electrically induced load on tissue?

5 DR. SHKOLNIKOV: A: In case of watts per metre squared,
6 it is a measure of how much energy per unit time --
7 it's joules per second -- is present on the surface of
8 a human body. Or incident on the surface of the human
9 body.

10 MR. BENNETT: Q: Okay. Can I -- people hand out
11 documents that I had brought forward here? Was that
12 done? Oops, I'm sorry, guys, I should have --

13 THE CHAIRPERSON: Are you moving to another topic?

14 MR. BENNETT: I'm actually just going to refer to an
15 exhibit, but this is all going to tie into the same
16 issue.

17 THE CHAIRPERSON: Okay.

18 MR. BENNETT: It's just -- and again, sir, it's just a
19 very complex technical issue with -- this has to be,
20 it just has to be addressed. So if you -- you know,
21 if you wanted to take a break before --

22 THE CHAIRPERSON: Yes. I think we will, then, take a
23 break now and perhaps the documents also can be given
24 to the Hearing Officer --

25 MR. BENNETT: Absolutely.

26 THE CHAIRPERSON: -- and he can pass them around.

1 MR. BENNETT: Absolutely.

2 THE CHAIRPERSON: Because then they can be entered and so
3 on. We will take a break now, then, for lunch. And
4 we'll return at one o'clock.

5 But before we leave, I noticed that a
6 gentleman just came in with some photography
7 equipment, and we've already dealt with that matter
8 with respect to the hearing, and so I'll ask Mr.
9 Bemister to review that with the gentleman. Thank
10 you.

11 We'll return at one o'clock. Thank you.

12 **(PROCEEDINGS ADJOURNED AT 11:53 A.M.)**

13 **(PROCEEDINGS RESUMED AT 12:59 P.M.)** **T41/42**

14 THE CHAIRPERSON: Please be seated.

15 I'd just like to remind everyone that
16 further to our discussion yesterday, I believe it was,
17 we will be adjourning the hearing at 4:00 today to
18 allow people to travel home. So we'll be organizing
19 our time to, as I say, adjourn at 4:00.

20 Mr. Bennett, please continue.

21 MR. BENNETT: Okay. Now, I wanted to make reference to
22 Exhibit C19-8, page 4. There is a link on page 4, but
23 what I've provided is, I've just printed off separate
24 sheets of that link.

25 MR. FULTON: Mr. Chairman, Mr. Bennett has made copies of
26 a number of the exhibits for ease of reference, and so

1 Mr. Bemister will pass those copies out, and it will
2 reduce the amount of arm strength that we need to
5 employ.

4 THE CHAIRPERSON: Thank you.

5 MR. BENNETT: Q: If you want to go to page 4,
6 gentlemen, you'll see that one page there is the link
7 that I'm referring to. But you'll actually see the
8 link on page 4 with that title.

9 MR. LOSKI: A: Mr. Bennett, is it this one?

10 MR. BENNETT: Q: Yes? Yes.

11 MR. LOSKI: A: Thank you.

12 MR. BENNETT: Q: Yeah. You just let me know when
13 you're ready, if you want me to -- if you want to talk
14 at the same time while you're looking at that paper,
15 that one sheet of paper. It's just making reference
16 to frequency interaction. Even though it's considered
17 extremely low-frequency, I just want to draw relevance
18 to the issue and the significance of the topic.

19 Is everybody ready to go?

20 MR. LOSKI: A: Yeah.

21 MR. BENNETT: Q: Okay. Doctor, you know, some people
22 might not be used to seeing infrared, so have you seen
23 infrared work or thermography used for electrical
24 inspections before?

25 DR. SHKOLNIKOV: A: Yes, I have performed it on many
26 occasions.

1 MR. BENNETT: Q: Okay, that's good. Now, in qualifying
2 the technology, just so people can understand this
5 accurate technology, wouldn't you agree that this
4 technology, used properly, allows electrical problems
5 to be seen prior to failure and assisting electrical
6 professionals in doing their job?

7 DR. SHKOLNIKOV: A: I think that's a broad statement.
8 The infrared thermography, which for other people is a
9 measurement of temperature using optical means, so you
10 see it as if it's a real image, but unlike human eye,
11 it can see basically the temperature of the
12 environment. It's useful to identify where on
13 equipment the temperature may be exceeding tolerances
14 for the design of the device. So, for example, when I
15 work on cases or on projects where there is a
16 suspicion that electrical overstress condition,
17 meaning too much electricity flew through some area,
18 it is sometimes a quick and dirty way to see the hot
19 spots on the surface and through that identify whether
20 there are plausible mechanisms to explain the field
21 failure.

22 MR. BENNETT: Q: Yes. Absolutely. Now, you can see
23 the parallel feeds coming through the top of the motor
24 control centre?

25 DR. SHKOLNIKOV: A: I'm not --

26 MR. BENNETT: Q: On the infrared image up top, you've

1 got, you know -- those are parallel feeds coming
2 through the top of a motor control centre.

5 DR. SHKOLNIKOV: A: There is nothing here, but I'm
4 going to take it at your word that this is what it is.

5 **Proceeding Time 1:04 p.m. T43**

6 MR. BENNETT: Q: Just -- yeah. Take as word now. Now,
7 where the conductors are coming through the -- now,
8 keeping it -- I want to keep this simple, but the
9 technical information is really relevant. Keeping it
10 simple, you know, these are single conductors coming
11 through the top of a metal cabinet and they require
12 special consideration and installation, so the 60
13 hertz frequency of each conductor don't interact or
14 electromagnetically induce the cabinet, the metal
15 cabinet. Is that correct?

16 DR. SHKOLNIKOV: A: Considering that I just have two
17 poor resolution documents with no specifications, I
18 cannot --

19 MR. BENNETT: Q: You've got single conductors coming
20 through the top of the metal cabinet with no mica
21 board.

22 DR. SHKOLNIKOV: A: But I don't know even what gauge
23 wire it is. I can't tell --

24 MR. BENNETT: Q: The gauge isn't really significant for
25 this application. We're talking about the frequency
26 interaction, the importance of installing

1 electromagnetic fields correctly because of what they
2 can interact with. I can tell you that, and here's an
3 example of this, those conductors are insulated for a
4 maximum of 90 degrees Celsius. Now, because of the
5 installation and the fact that they did not use a mica
6 board or insulation board in the top of the cabinet,
7 you know, spot temperature number 3 shows that that
8 field that's been induced around that conductor has
9 created heat of 88 degrees, and we don't know the load
10 it was under at that particular time. But if it
11 exceeds that load you're going to have a problem with
12 insulation.

13 DR. SHKOLNIKOV: A: I'm sorry, maybe I -- I mean, not
14 knowing the details of this, based on my experience of
15 looking at images like this, all I'm seeing is that
16 there is a device, whether it's a large device or
17 small device, without knowing the gauge of wire I
18 can't tell you --

19 MR. BENNETT: Q: It's a motor control centre, sir.

20 DR. SHKOLNIKOV: A: I know but --

21 MR. BENNETT: Q: It's controlling several different
22 motors. It's a big gauge wire.

23 THE CHAIRPERSON: Mr. Bennett, please.

24 DR. SHKOLNIKOV: A: All I'm seeing is that there is a
25 temperature increase. Whether that is because of the
26 fact that there's a current flowing through it and

1 there's joints, soldered joints or other joints above
2 it or due to other nature is -- there's not enough
3 information in this document for me to describe what,
4 you know, the nature of the temperature increase in
5 this diagram.

6 MR. BENNETT: Q: Okay, since I did the inspection for
7 Tokol Industries, for them and their insurer at the
8 same time, there's no mica board in the top of the
9 cabinet, no insulating board. So the frequencies, the
10 60 hertz frequencies are interacting with the cabinet
11 because of what it's made out of.

12 DR. SHKOLNIKOV: A: I'm sorry, I -- and to do justice,
13 even -- for projects even like this, I usually ask for
14 a lot of information from my client to understand what
15 I'm looking at, so that I don't make an engineering
16 opinion or scientific opinion based on lack of
17 information. Like for the smart meter case, for the
18 smart meter project, I went to the FCC and have
19 downloaded specifications to understand what am I
20 given and what am I measuring. You're asking me to do
21 the same here with two poor resolution images.

22 THE CHAIRPERSON: I'm going to have to interrupt for a
23 second because I have to admit that I've lost sight of
24 the question.

25 MR. BENNETT: Well, the whole --

26 THE CHAIRPERSON: No, please just restate the question.

1 MR. BENNETT: I'm sorry.

2 THE CHAIRPERSON: And that'll perhaps help focus
5 everybody, most importantly perhaps me.

4 MR. BENNETT: Q: Would you agree that if everything I'm
5 saying is correct, that you've got 60 hertz parallel
6 conductors coming through the top of that cabinet,
7 there is no mica board, that those electromagnetic
8 fields because of the way this is installed, they're
9 just interacting with the cabinet? Those
10 electromagnetic field, that simple.

11 DR. SHKOLNIKOV: A: If you're saying for me to take
12 your word that they're interacting with
13 electromagnetic field?

14 MR. BENNETT: Q: Can they do that?

15 THE CHAIRPERSON: Please, let the doctor answer your
16 question.

17 DR. SHKOLNIKOV: A: I mean, you're an engineer the same
18 way as I am, and you set it to precise science.
19 You're asking me to make decisions based on hypothesis
20 and statements I cannot confirm. So I mean I have no
21 issue if you would like to understand the failure
22 analysis performed in this case, but it would be
23 imprudent of me and improper of me to make this
24 analysis based on two images with no documentation
25 accompanying them.

26 MR. BENNETT: And with respect, Mr. Chairman, as an

1 I mean, I'm not going to argue with you. I'm not an
2 electrical engineer.

5 MR. BENNETT: And that's all I'm talking about here,
4 is--

5 THE CHAIRPERSON: You'll have to either be satisfied with
6 his answer or ask another question to probe more
7 deeply.

8 MR. BENNETT: Okay, but -- no, it's really actually, you
9 know, for the education of the people just to
10 understand generally. This is a very complex issue.
11 That just because a frequency is lower, an extremely
12 low frequency, does not mean that it can't cause
13 problems. And I'm just prepared to move on from
14 there.

15 DR. SHKOLNIKOV: A: I mean, if -- you're moving on? Or
16 would you like me to respond? I didn't understand.

17 MR. BENNETT: Q: I can tell you that they put in a
18 piece of insulating board and corrected the problem.
19 Where otherwise they would have gone to failure and
20 caused an explosion.

21 DR. SHKOLNIKOV: A: I have no way to --

22 MR. BENNETT: Q: Okay, so we can just move on from
23 there.

24 I know. Listen, I do apologize for that,
25 but in our technical world when things are going to
26 blow up, we just tell people to run and they try to

1 keep up.

2 Okay, in that -- on that same sheet, can
3 you see the sine wave, the image of the sine wave?

4 DR. SHKOLNIKOV: A: Yes.

5 MR. BENNETT: Q: Sixty-hertz sine wave.

6 DR. SHKOLNIKOV: A: Yes, one cycle sine wave, correct.

7 MR. BENNETT: Q: Okay. Does that represent one cycle
8 of a 60-hertz electrical cycle?

9 DR. SHKOLNIKOV: A: I don't see the time scale, but I
10 will take your word for it.

11 MR. BENNETT: Q: Okay -- yeah. Does that cycle happen
12 sixty times per second?

13 DR. SHKOLNIKOV: A: By --

14 MR. BENNETT: Q: If it is --

15 DR. SHKOLNIKOV: A: -- the oscillation happens sixty
16 times a second.

17 MR. BENNETT: Q: Sixty times a second. Does that --
18 does that EMF -- does that frequency expand and
19 collapse with every half a cycle?

20 DR. SHKOLNIKOV: A: Sir, could you repeat --

21 MR. BENNETT: Q: Does an electromagnetic field expand
22 and collapse with every half-cycle, or twice per
23 cycle?

24 DR. SHKOLNIKOV: A: The intensity of electromagnetic
25 fields induced by the current flow, this would go up
26 and down twice -- at twice the frequency, 120 hertz.

1 MR. BENNETT: Q: Right. 120 hertz. Now, my point is
2 this. Is it just the metal of the cabinet interacting
3 with 120 -- or, pardon me, with 60 hertz? And what
4 it's trying to do is, when you see these -- when these
5 frequencies are expanding and collapsing, going
6 positive and negative, you've got metal domains in
7 that cabinet. If they can, they're trying to polarize
8 and change direction, 120 times a second. With the
9 frequencies. Just yes or no.

10 DR. SHKOLNIKOV: A: Well, if you're asking me if the
11 grain boundaries that are in the metal move as a
12 function of this frequency, considering this as a
13 solid conductor, I doubt that's an effect. I suspect
14 if you raise -- if this was a powder material, I would
15 -- rather than a wire, I think I would agree with you.

16 MR. BENNETT: Q: Wouldn't anything atomically polarize
17 with the oscillation of the frequency? That's the
18 basics of physics related to it.

19 DR. SHKOLNIKOV: A: I think -- well, that was a
20 different question you asked. I think the answer is,
21 electric and magnetic fields can cause rotation of
22 molecules, but inside the metal conductor the
23 conduction of current happens by flow of electrons,
24 and usually shield the nuclear and molecular domains
25 to be fixed, because the majority of the -- because
26 electrons effectively shield the atoms from the

1 electric and magnetic field.

2 MR. BENNETT: Q: Yeah, I was -- even the first part of
5 your question, just verifying that, is that they
4 oscillate, or polarize with that, atomically.

5 **Proceeding Time 1:13 p.m. T45**

6 DR. SHKOLNIKOV: A: I think what I'm saying is that
7 electrons flow back and forth. I think your statement
8 about molecules or grain boundaries in a metal
9 rotating as a function of electromagnetic field,
10 unless this is a much much -- unless this is a
11 basically micro scale diagram, where there's electro
12 migration or other microscopic effects are happening,
13 I would have to disagree.

14 MR. BENNETT: Q: Well, isn't everything on the periodic
15 table -- everything in existence is electrical at an
16 atomic and molecular level. Protons, neutrons,
17 electrons.

18 DR. SHKOLNIKOV: A: No, protons are not electrical.
19 Protons are --

20 MR. BENNETT: Q: Atoms and molecules are electrons.

21 DR. SHKOLNIKOV: A: Atoms and molecules contain
22 electrons, but far from everything in them is
23 electrical.

24 MR. BENNETT: Q: But they contain -- they are
25 electrical.

26 DR. SHKOLNIKOV: A: I don't --

1 MR. BENNETT: Q: They have electrical properties.
2 There's much more to them, but they have electrical
3 properties.
4 DR. SHKOLNIKOV: A: I would agree they have electrical
5 properties.
6 MR. BENNETT: Q: Thank you. And having electrical
7 properties, what does a magnetic or an electromagnetic
8 field do when it interacts with those properties? I
9 mean, a whole variety of things can happen, but that
10 oscillation you're talking about, or the movement is
11 part of it.
12 DR. SHKOLNIKOV: A: Well, if you take a free atom or
13 molecule, there could be a lot of behaviours. But
14 we're talking about a solid conductor and therefore
15 the rotations and movement of objects requires a force
16 that can overcome the bounds to actually cause a
17 rotation of a molecule.
18 MR. BENNETT: Q: I'm not talking about a conductor.
19 I'm talking about that atom or molecule. I'm talking
20 about outside that conductor, the very basics of
21 science related to this.
22 DR. SHKOLNIKOV: A: Yes.
23 MR. BENNETT: Q: It's going to oscillate, it's going to
24 oscillate with the frequency.
25 DR. SHKOLNIKOV: A: So in experiments where, you know,
26 Bose Einstein Kanten states that 20 micro Kelvin Gauss

1 of molecules, if you apply electric magnetic field, it
2 is true you're going to observe the molecules are
5 rotating in air.

4 MR. BENNETT: Q: Okay. A question for you, and again,
5 just yes or no. Can extremely --

6 MR. MACINTOSH: Wait for the question.

7 MR. BENNETT: Q: Okay. Can extremely low frequencies
8 of 60 hertz be very dangerous if consideration isn't
9 given to what they interact with, and can they be very
10 dangerous? Not in all applications. Can they be
11 dangerous, yes or no, if it's not installed properly?

12 DR. SHKOLNIKOV: A: Sorry, there are two separate
13 questions. Installed properly, consideration.

14 MR. BENNETT: Q: Can -- you know, with respect, I'm
15 just really trying to get to the basics. I'm not
16 trying to get into --

17 THE CHAIRPERSON: Well, ask your questions one question
18 at a time.

19 MR. BENNETT: Q: Okay. Can extremely low frequencies
20 be dangerous?

21 DR. SHKOLNIKOV: A: Yes, the electric shock is one of
22 the common considerations given to 60 hertz
23 frequencies.

24 MR. BENNETT: Q: Thank you, and I appreciate that, I
25 really appreciate your patience. What's the frequency
26 or number of cycles for the smart meter?

1 DR. SHKOLNIKOV: A: There are two. The 900 megahertz
2 LAN means 900 million oscillations per second.
5 There's also a ZigBee which is 2.45 million cycles per
4 second.
5 MR. BENNETT: Q: 2.45 billion, billion.
6 DR. SHKOLNIKOV: A: Sorry, billion. Sorry, billion,
7 yes, you're correct.
8 MR. BENNETT: Q: Okay. Okay, and okay, and you've
9 already answered that, how many times -- how many
10 times per cycle or second are they oscillating? Is it
11 double the speed of the -- double the frequency of 1.8
12 billion times per second for the 900 and 4.8 billion
13 times per second for the Zig-Bee?
14 DR. SHKOLNIKOV: A: Yes, the intensity of the fields
15 does oscillate at that frequency.
16 MR. BENNETT: Q: Thank you very much. Now, and here's
17 a question for you. It is said that these radio
18 frequencies are too weak to break DNA. Okay. I'd
19 like to know what can possibly stay together trying to
20 change direction 180 degrees, you know, 1.8 billion
21 times a second or 4.8 billion times a second. And I'm
22 making reference to this for interaction with --
23 THE CHAIRPERSON: Just ask the question.
24 MR. BENNETT: Q: Okay, sorry about that.
25 DR. SHKOLNIKOV: A: Can you restate? Sorry.
26 MR. BENNETT: Q: Okay, it's said that -- I've read this

1 too, that radio frequency EMFs are too weak to break
2 DNA. Okay. But I'm asking this. What could possibly
3 stay together trying to change direction 180 degrees
4 at 1.8 or 1.8 billion times a second, or 4.8 billion
5 times a second?

6 **Proceeding Time 1:18 p.m. T46**

7 DR. SHKOLNIKOV: A: To address that, coming back to our
8 discussion of the wire, there is a difference between
9 frequency of applied force and the rotation of the
10 device. And there are many different answers to why
11 that is the case for DNA. A simple one is that the
12 energy gap to require DNA to -- let me take a step
13 back. The DNA is inside, from my understanding of
14 discussion of biologists, is inside the liquid. So if
15 the RF signal hits it, like, is impinging on it, and
16 tries to force it to rotate, it immediately contacts
17 -- makes contact with water and other molecules around
18 it, and instead of rotates in it, it goes back. So it
19 never rotates fully.

20 And this concept of the electric heating,
21 because this process generates heat, is the
22 microscopic basis for the heating that is considered
23 as part of Safety Code 6.

24 MR. BENNETT: Q: Precisely. But you're talking -- they
25 do try to change direction 120 -- 180 degrees,
26 regardless of whether they hit water and slow down,

1 more resistance, creating heat. It is still trying to
2 polarize and change direction 180 degrees. Trying to.
5 Whether it can or not.

4 DR. SHKOLNIKOV: A: Well, okay. So it is trying to
5 rotate, but it rotates as a response to the electric
6 and magnetic field.

7 MR. BENNETT: Q: Precisely. Could inducing current
8 into the body create a heat effect?

9 DR. SHKOLNIKOV: A: Absolutely.

10 MR. BENNETT: Q: Thank you. Could polarization
11 billions of times per second produce another heat
12 effect?

13 DR. SHKOLNIKOV: A: Absolutely.

14 MR. BENNETT: Q: With the human organism -- and now,
15 this is a question to Mr. Bailey. With the human
16 organism as a whole being electrical, couldn't
17 inducing currents into an existing electrical system
18 create heat as a byproduct of that electrical failure
19 in the body?

20 DR. BAILEY: A: I don't know what the basis is for
21 assuming an electrical failure in the body. I don't
22 understand that.

23 MR. BENNETT: Q: Okay. Being in the neurosciences, and
24 what are the voltages of a cell?

25 DR. BAILEY: A: Oh, it's in the range of about minus 70
26 millivolts.

1 MR. BENNETT: Q: Is that -- and there is a hundred
2 trillion cells in the body. Are they all minus 70
5 millivolts?

4 DR. BAILEY: A: No.

5 MR. BENNETT: Q: Does each cell generate its own
6 electricity?

7 DR. BAILEY: A: It maintains -- cells maintain
8 electrical potential between the inside and the
9 outside of the cell. That's what I referred to.

10 MR. BENNETT: Q: Yeah. Do they have their own
11 frequencies? How many frequencies associated with a
12 human organism? The body -- from the whole entire
13 body, how many frequencies?

14 DR. BAILEY: A: I don't know that there is -- that's
15 ever been collected in one place.

16 MR. BENNETT: Q: The brain, and then what's the
17 frequency of a brain?

18 DR. BAILEY: A: The frequency that you can record from
19 the human brain, as we did in the laboratory, could be
20 in the range from a DC field all the way up into, you
21 know, hundreds of hertz.

22 MR. BENNETT: Q: Hundreds of hertz. And where I'm
23 going now with this is, you know, your report -- did
24 you -- well, does your report, the E^xPonent Report,
25 refer to the number of frequencies in electricity in
26 each cell?

1 DR. BAILEY: A: No. We referred to the frequencies of
2 the system that was impinging upon the body.

5 MR. BENNETT: Q: The frequencies of the system. You
4 negated [*sic*] to consider the interaction with a
5 living human being.

6 DR. BAILEY: A: No, sir, we did not.

7 MR. BENNETT: Q: Well, where is your electrical
8 information? How is -- how can you leave out the
9 electrical information related to a human organism?
10 And just refer to heat? Oh, there appears to be a
11 heat effect.

12 DR. BAILEY: A: We did not leave it out of our
13 consideration in assessing the Itron smart meters.

14 MR. BENNETT: Q: You didn't leave it out?

15 DR. BAILEY: A: We did not leave it out, because, as is
16 well known in the scientific and engineering
17 communities, the interactions of oscillating fields
18 with the body, including the nervous system, the
19 induction of voltages and currents is a property which
20 is largely confined to frequencies below 10 megahertz
21 and particularly below 100 kilohertz. In the ELF
22 range, for instance, as you talk about your diagram
23 here, where the induction of the -- of potentials in
24 the body if sufficiently high, might be able to
25 perturb that membrane potential of the nerve cell, and
26 for instance cause it to fire.

1 **Proceeding Time 1:23 p.m. T47**

2 So we know that the application of
3 electricity, either directly to tissues or by
4 sufficiently high 60 hertz EMF fields can trigger
5 nerve cells to fire, and this is used -- you can
6 demonstrate this, as we've done many times in the
7 laboratory, or you can -- a neurologist will use this
8 as a basis for testing the response of nerves to
9 determine whether they have been injured or not. So
10 it's a very well-known phenomenon.

11 But at higher frequencies in the radio
12 frequency range, these effects are not observed at the
13 lowest level, but rather the heating effect of tissue
14 is observed as the response.

15 MR. BENNETT: Q: Can I just -- I just wanted to know
16 where in your report you incorporated the electrical
17 properties, everything electrical related to a human
18 organism in order to talk about a frequency
19 interaction which is an electrical interaction with
20 something electrical. Something very basic and if I
21 can say this, is --

22 THE CHAIRPERSON: No, no, just ask the question.

23 MR. BENNETT: Q: Where is that in your report?

24 DR. BAILEY: A: I answered that question already, sir.

25 MR. BENNETT: Q: It's not in the report?

26 DR. BAILEY: A: I did not go into a description of the

1 electrical properties of the human body and include it
2 in the report.

5 MR. BENNETT: Q: Okay. Now a question to you, Doctor.
4 Is electrical information left out of a report a cause
5 of concern for you as an electrical professional?

6 DR. SHKOLNIKOV: A: So I want to maybe clarify
7 something with my colleague, and there is where
8 biologists and physicists talk in a slightly different
9 language. The human body has a very large set of
10 electromagnetic frequencies due to a simple fact that
11 our body is not at zero, absolute degree zero. So
12 every molecule in our body oscillates. You know, the
13 frequency range is broad and the centre is about -- at
14 about 10 to the -- it's about in terahertz, so 10 to
15 the 12 cycles per second. So all the molecules in our
16 body oscillate. If you start measuring in that
17 frequency range you will detect it.

18 So for example, as we have stated in our
19 report, the natural RF frequency -- RF energy from a
20 human body is, you know, there's a significant
21 component compared to FortisBC advanced meters, and
22 that is actually a consequence of the fact that in a
23 human body, molecules continuously rotate and distort
24 and operate -- you know, move in space, move around
25 each other as a function of time.

26 MR. BENNETT: Q: Okay. Wouldn't you as an electrical

1 professional, wouldn't you as an electrical
2 professional like to know every frequency in a
5 frequency equation? Yes or no is -- wouldn't you as
4 an electrical professional really insist upon having
5 all the electrical information in an electrical
6 equation when you're talking about interaction with
7 this type of magnetic field, electromagnetic field?
8 And --

9 DR. SHKOLNIKOV: A: No, but I would just --

10 MR. BENNETT: Q: Just let's have an answer.

11 DR. SHKOLNIKOV: A: No, but if you give me a brief two
12 or three sentence response to clarify that answer.

13 MR. BENNETT: Q: When you mix two frequencies, just say
14 that you're mixing two frequencies. Two frequencies.

15 DR. SHKOLNIKOV: A: Mm-hmm.

16 MR. BENNETT: Q: Do you get a resultant frequency? Can
17 you get a resultant frequency?

18 DR. SHKOLNIKOV: A: If you have -- you're talking about
19 in a human body or in general?

20 MR. BENNETT: Q: Just anything in general. When you
21 mix two frequencies, just let's pick two and say that
22 they're mixing together, don't we electrically add
23 them up and there's a resultant frequency?

24 DR. SHKOLNIKOV: A: If you put two frequencies into a
25 mixer, which is a specific non-linear device made by
26 microwave engineers, your outcome can be -- you will

1 part of electromagnetic fields, will begin to -- you
2 know, through this long process of, like, different
3 levels of effect, will result in heating, and that's
4 exactly what Safety Code 6 is trying to address.

5 MR. BENNETT: Q: I don't know if I'm allowed to say
6 this, but you're just talking around the issues as an
7 electrical professional. But again, I'll just stop
8 right there, sir.

9 MR. MACINTOSH: Well --

10 MR. BENNETT: Q: We've got a 60 hertz --

11 MR. MACINTOSH: No, no, excuse me. With respect, Mr.
12 Bennett isn't allowed to say that if he hasn't
13 established the basis for it, and I ask him to just be
14 mindful that he's not supposed to insult a witness
15 gratuitously, and he should put another question.

16 MR. BENNETT: And, sir, truly I mean no disrespect
17 whatsoever. But if I had this discussion with an
18 electrical professional --

19 MR. MACINTOSH: "Talking around the issue" has that kind
20 of ring to it, okay? I ask Mr. Bennett to just put
21 more questions.

22 MR. BENNETT: Q: As electrical professionals, we just
23 wouldn't talk to each other like that. That's just
24 ridiculous. But that's just -- we have a 60 hertz
25 electrical grid, is that correct? In North America.

26 DR. SHKOLNIKOV: A: Yes, that is correct.

1 MR. BENNETT: Q: That 60 hertz grid, why does it have
2 to talk to 60 hertz appliances inside the building?
3 Why is everything on a spec plate say 60 hertz?
4 DR. SHKOLNIKOV: A: I think the term "talk" is not
5 precise.
6 MR. BENNETT: Q: Okay. Electrical compatibility is
7 really important?
8 DR. SHKOLNIKOV: A: Actually, a wide range of
9 appliances around us don't necessarily even care about
10 the frequency. They're operating -- the wall clocks
11 that keep the time based on 60 hertz absolutely have
12 to do it. But if I take that laptop over there and I
13 use 50, 60 hertz, or a range of frequencies, it will
14 continue to perfectly function regardless of the
15 frequency within the range that I've put into it.
16 MR. BENNETT: Q: How wide a range?
17 DR. SHKOLNIKOV: A: It's depending on the power supply
18 designer. Those ranges are going to be printed and
19 the power block that that laptop has will actually
20 list the frequency ranges it can utilize.
21 MR. BENNETT: Q: B.C. Hydro's manager of the smart
22 meter program, Gary Murphy, stated this, and you just
23 tell me whether it's accurate or not. "60 hertz
24 electrical grid communicates with a 60 hertz
25 appliance, and if that differed, and if they differed,
26 they may not run efficiently or safely. May not."

1 DR. SHKOLNIKOV: A: It is correct that there are some
2 appliances which are designed -- because of historical
3 use of 60 hertz, are designed to operate most
4 efficiently at 60 hertz. But for example, the power
5 supplies that are in laptops actually typically
6 operate as efficiently, if not even more, on a 50
7 hertz circuit -- 50 hertz grid in Europe.

8 MR. BENNETT: Q: What human cell -- or what organism,
9 what anything related to a human, runs at 900 million
10 cycles per second, or 2.4 billion cycles per second?

11 DR. SHKOLNIKOV: A: There are a range of frequencies in
12 human body, and I would agree majority of -- on the
13 microscopic level, majority of the frequencies you're
14 going to encounter will have a peak that is higher
15 into 10 to the 12 hertz, but there will be a
16 substantial percentage of oscillations in the human
17 body at lower frequencies all the way, you know,
18 throughout the whole RF range.

19 **Proceeding Time 1:32 p.m. T49**

20 MR. BENNETT: Q: And here's an example I just put to
21 you that the people that do the specific absorption
22 rate said that -- they state in their literature,
23 here's a brain wave at 8.3 hertz. Half a hertz when
24 you're sleeping. Half a hertz when you're sleeping.
25 What would 900 million hertz a field do with that
26 human organism? What would 2.4 billion cycles,

1 billion cycles per second do to an 8 cycle electrical
2 system, electro-chemical system?

5 DR. BAILEY: A: Sir, that issue has been under study
4 for some time, and if you go to the reports that we
5 reference, there is a wealth of information about
6 studies in which people have been exposed, and the
7 electrical activity of the brain and their cognitive
8 function and performance have been studied. And we
9 don't have any indication from all of these biological
10 experiments that in fact a harmful effect of these
11 radio frequency field exposures, including those like
12 smart meters, have or are having adverse effects.

13 MR. BENNETT: Q: How would you expect to get a result
14 like that when you leave out the electrical properties
15 and frequencies of humans, the orientation to the
16 electromagnetic field that's hitting them, that's
17 going into their body, electromagnetically inducing
18 electrical systems? You left that information out of
19 your report. How do you qualify that?

20 DR. BAILEY: A: Sir --

21 MR. BENNETT: Q: Where is that in your report?

22 DR. BAILEY: A: Sir, I answered that question already.

23 MR. BENNETT: Q: Can you refer me to the page?

24 DR. BAILEY: A: Sir, I don't draw conclusions based
25 about assumptions of interactions. You're assuming
26 that radio frequency fields have an interaction which

1 is harmful. And I'm telling you I don't care about
2 assumptions. I look at the data, and the data that we
5 have do not indicate the kind of effects that you are
4 suggesting.

5 MR. BENNETT: Q: Incomplete data. You know, first I'd
6 just like to say that you know what? Electricity is
7 an assumption.

8 THE CHAIRPERSON: No, Mr. Bennett, please ask a question.
9 I mean we've --

10 MR. BENNETT: Q: Okay. Where is the data in your
11 report related to the electrical information
12 associated with the human organism, orientation to the
13 electromagnetic fields associated with these
14 frequencies so they can be realistically looked at for
15 what they are?

16 DR. BAILEY: A: I have answered that question already,
17 sir.

18 MR. BENNETT: Q: Where is that? In which page of your
19 report?

20 DR. BAILEY: A: I said, I have already told you that I
21 did not do a discussion of the electrical properties
22 of the human body.

23 MR. BENNETT: Q: Doctor, you know, could 900 million
24 hertz per second cause an electrical change in an
25 electrical device or a brain 8 hertz? Could it?

26 DR. SHKOLNIKOV: A: Not being a biologist, I'll answer

1 it from the point of view of an electrical engineer.
2 If I were to design an antenna system, and I'm sure
3 you have seen antennas since you're an electrical
4 engineer, they usually have a centre frequency at
5 which they operate, and a bandwidth. So if I have
6 something that is designed to oscillate at, let's say
7 -- not going to as extreme as 8 hertz. If I have 100
8 kilohertz antenna for -- well, 200 kilohertz for AM
9 radio, and then I try to use that antenna to receive
10 900 megahertz, I will have spectacularly failed
11 because the bandwidth of each antenna is usually
12 limited by the size at the frequency -- at the size of
13 cells, like DNA molecules, there was a calculation
14 recently in response to Mr. Blank's assertion, there
15 was an article published that calculated that the
16 bandwidth of an antenna of the size of a DNA molecule
17 would be about one-tenth of the hertz.

18 So if I look at one-tenth of the hertz at
19 900 -- you know, for a molecule of 900 megahertz,
20 there's quite a few .01 hertz jumps I'd have to go
21 through to get to the brain frequency. So I would
22 actually, from just a purely electrical engineering
23 considerations, I would consider any system that has a
24 natural oscillation frequency on order of a hertz, to
25 be very likely completely transparent and not
26 interacting with 900 megahertz frequency radio waves.

1 MR. BENNETT: Q: How is that electrically possible?
2 How is that electrically for it not to have an
5 interaction?

4 DR. SHKOLNIKOV: A: So I can give you an example. Your
5 cell phone, or like this cell phone has multiple
6 antennas. Because antennas are tuned to each specific
7 frequency, they don't want to reuse -- even on those
8 devices they don't want to reuse it because one
9 antenna is efficient for receiving cellular signal;
10 another antenna is efficient for receiving WiFi
11 signal. So they split them apart.

12 **Proceeding Time 1:38 p.m. T50**

13 And for example when you bought receivers
14 when -- you know, you buy an AM and FM radio
15 receivers, they will have an antenna for AM radio and
16 FM radio, because using the same antenna for both
17 would result in a bad performance.

18 And we're talking about small changes of
19 frequency as a ratio to each other, and you're saying
20 let's take a 10 hertz antenna and use it for -- that's
21 tuned to ten hertz and try to receive 900 megahertz,
22 and that's a ratio of 90 million. And basically it
23 would be a very bad design for engineer to try to do
24 that.

25 MR. BENNETT: Q: Precisely. And that's the whole point
26 related to it. Question for you on your phone. What

1 if the frequencies changed on one end or another?

2 Would your appliance work?

5 DR. SHKOLNIKOV: A: So, when I say a bad design, I am
4 saying that if the cell phone frequencies changed a
5 lot, my cell phone would stop receiving the signal.
6 Likewise I am saying if there was something in the
7 human body that was tuned to receive 10 hertz signal,
8 changing the frequency that it's exposed to by a
9 factor of 90 million would result in that system not
10 receiving any of the signal and just letting it pass
11 through the body.

12 MR. BENNETT: Q: Correct. Now, Mr. Bailey, based on
13 what he just said, what does it mean to a neurological
14 system to stop receiving a signal.

15 DR. BAILEY: A: I don't see any analogy to stop
16 receiving a signal in biology except death.

17 MR. BENNETT: Q: Precisely.

18 DR. SHKOLNIKOV: A: But here I'm talking about a system
19 stopping to receive -- not interacting and receiving
20 signal from AMI advanced meter, and I don't -- you
21 know, we have -- our human body seems to have survived
22 without receiving AMI advanced meter signal for a long
23 time, so I can't imagine a plausible mechanism of how
24 stopping to receive AMI advanced meter signal could be
25 considered a detrimental or hazardous effect, as an
26 electrical engineer.

1 MR. BENNETT: Q: But, so, you're saying that the
2 electrical devices wouldn't work, but the AMI program
5 is okay.

4 DR. SHKOLNIKOV: A: I don't --

5 MR. BENNETT: Q: The human electrical device might not
6 work. The signal might not get through. Is that a
7 reality? If your brain stops working --

8 THE CHAIRPERSON: One question at a time.

9 MR. BENNETT: Okay. Sorry.

10 DR. SHKOLNIKOV: A: So, I don't -- if you -- I think
11 the question you're asking, if a human body stopped
12 receiving AMI smart meter signal, would that be a bad
13 thing? And the answer is, we have -- I mean, I am in
14 this room, not exposed to AMI advanced meter signal,
15 and my health is not adversely affected. And so if I
16 stop receiving it, even with advanced meter near me, I
17 can't see how that causes an electrical hazard.

18 MR. BENNETT: Q: To respond to that part of that, Mr.
19 Bailey, isn't it -- wouldn't it be a reality of the
20 physiology that every human being would be considered
21 to be different when it comes to sensitivity to these
22 fields, based on hydration, toxicity, lifestyle,
23 genetics, DNA, and just a whole bunch of different
24 factors?

25 DR. BAILEY: A: You can theorize about that, but in
26 fact it would actually take measurements in a

1 formed.

2 MR. BENNETT: Q: Dr. Bailey, are nerves electrical?

5 DR. BAILEY: A: Yes.

4 MR. BENNETT: Q: Do they send electrical impulses?

5 DR. BAILEY: A: Yes, they do.

6 MR. BENNETT: Q: If a high-speed electromagnetically
7 induced frequency interfered with that transmission of
8 that signal, could it affect the nervous system?

9 DR. BAILEY: A: At sufficiently high intensities that's
10 possible.

11 MR. BENNETT: Q: Did you know that Safety Code 6 admits
12 that causality, biological plausibility, and
13 reproducibility is missing as far as how a linking
14 frequencies to adverse health effects? Have you seen
15 that on page 9?

16 DR. BAILEY: A: Yes.

17 MR. BENNETT: Q: Okay. Have you also seen the strength
18 of this code where this code says stimulation --
19 "Unintentional stimulation of tissue is to be avoided,
20 as are heat effects"? And when it talks about
21 unintentional stimulation of tissue, now here again it
22 says, "Stimulation of tissue is to be avoided.
23 Experimental studies show it can cause nerve -- lead
24 to nerve and muscle depolarization." What is nerve
25 and muscle depolarization.

26 DR. BAILEY: A: That is where you have stimulation of

1 nerves. And obviously the purpose of Safety Code 6 is
2 to avoid such events, and that's why the code is in
5 place.

4 MR. BENNETT: Q: So the code is in place to avoid the
5 stimulation of tissue, but the specific absorption
6 rate talks about how much you're heating tissue. Is
7 that correct?

8 DR. BAILEY: A: At the radio frequency range, that's
9 correct.

10 MR. BENNETT: Q: Can nerve and muscle depolarization --
11 can affecting the neurological system also adversely
12 affect the immune and hormonal systems? Are they tied
13 together?

14 DR. BAILEY: A: Yes, there can be an influence between
15 these systems.

16 MR. BENNETT: Q: So would you agree that it's not a
17 good idea to use an EMF trigger on neurology? A
18 manmade -- I'm sorry, go ahead.

19 DR. BAILEY: A: I don't know what you mean by EMF
20 trigger.

21 MR. BENNETT: Q: These frequencies that are being
22 imposed upon people, if they're stimulating nerves and
23 causing depolarization, that's a mandate
24 electromagnetic field trigger.

25 If I can make an analogy like your car,
26 when you press the button to lock your car door,

1 you're imposing these frequencies on something and
2 it's causing a neurological problems. Is that a good
3 idea to do that with a manmade frequency?
4 DR. BAILEY: A: Sir, I don't think the body of
5 scientific research shows the claim that you are
6 proposing.
7 MR. BENNETT: Q: Safety Code 6 says that, the
8 guidelines.
9 DR. BAILEY: A: Not for exposures below the guidelines,
10 sir.
11 MR. BENNETT: Q: Exposures to the guidelines related to
12 heat only, is that correct?
13 DR. BAILEY: A: The guideline is set to protect against
14 adverse effects that occur at the lowest intensity
15 levels. And in the radio frequency range, those
16 effects are determined by Safety Code 6 as due to
17 heating of tissue.
18 MR. BENNETT: Q: Do you know, when we contacted Safety
19 Code 6 related to the code, do you know that Industry
20 Canada has replied to us on -- a reply was "Humans
21 aren't electrical"?
22 DR. BAILEY: A: Sir, I have no idea what conversations
23 you may have had with someone at Safety Code 6.
24 MR. BENNETT: Q: Do you know that Safety Code 6 left
25 out the antennas, the routers, and the entire coverage
26 area when it comes to frequency exposure?

1 DR. BAILEY: A: I'll have Dr. Shkolnikov address that.

2 DR. SHKOLNIKOV: A: Safety Code 6, as I have mentioned
3 earlier in testimony, does not distinguish between the
4 sources of RF exposure. You're supposed to explicitly
5 in the equations calculate the cumulative exposure and
6 verify -- cumulative, meaning additional exposure from
7 all the different sources, and to verify that the
8 total exposure be below the limit. It is not -- it
9 does not have, like some other countries, a
10 distinction depending on the source of the signal.

11 **Proceeding Time 1:47 p.m. T52**

12 MR. BENNETT: Q: I agree with you. And consistently
13 through this entire process, you have led the panel
14 and everybody else to believe that we're just talking
15 about a meter. Is that correct? We've just referred
16 to a meter. Is that correct?

17 DR. SHKOLNIKOV: A: I believe that is not correct, and
18 I believe on the record there is a summary of
19 collectors and other devices on the network that were
20 mentioned in the course of the submission, at least
21 from what I recall of reviewing the documents. As
22 well I think it was brought up as part of the oral
23 hearing testimony.

24 MR. WARREN: A: Yes, it was, Dr. Shkolnikov spoke to
25 the additive effects or potential additive effects of
26 WiFi routers and those sort of things too, with Mr.

1 Shadrack.

2 MR. BENNETT: Q: Do you know that Health Canada Safety
5 Code 6 left those out of their safety code? And that
4 that interaction from those pieces of equipment?

5 DR. SHKOLNIKOV: A: I believe that would be in a miss
6 -- well, not quite a correct statement, because as I
7 mentioned, Safety Code 6 doesn't leave anything out.
8 It says that you're supposed to evaluate devices based
9 on their frequency of operation and the strength of
10 the exposure. It does not say that a device with
11 label A or a device with label B is allowed to exceed
12 the limit and should have a particular distinction,
13 and that's why the Safety Code 6 is so short. Had it
14 started to list all the different sources of exposure,
15 it would be a by far longer document, if it started to
16 distinguish between the different sources of exposure.

17 MR. BENNETT: Q: When we contacted Health Canada in
18 September of 2010, and asked them what they did
19 related to frequency exposures and how they
20 incorporated the antennas, the routes, the wireless
21 infrastructure, talking to the meters, did you know
22 that they replied that they did not incorporate them
23 into Safety Code 6?

24 DR. SHKOLNIKOV: A: I think, as I said, the purpose of
25 health Safety Code 6 is to identify the exposure for
26 the human body if you will, serving as something that

1 receives a signal. If I think, and maybe when I
2 contacted Canadian government about questions on
5 specific installation, I have called Industry Canada,
4 which does have regulations that specify the testing
5 included in compliance with Safety Code 6 for the
6 specific devices. I think the Health Canada would --
7 you know, is not -- is trying to satisfy the -- to
8 specify a standard for exposure, not the standard for
9 verifying if each individual appliance meets it,
10 because that would be in the purview of Industry
11 Canada.

12 DR. BAILEY: A: And as Dr. Shkolnikov testified earlier
13 today, if you add up the exposure from all of these --
14 from the AMI meters and other sources, you're still
15 less than 1 percent of the Safety Code limit. So, we
16 don't have to have a separate standard for each one of
17 these devices if their exposure does not exceed the
18 overall limit.

19 MR. BENNETT: Q: Safety Code 6 based on heat, not
20 neurologic -- not an electrical interaction,
21 neurological function, immune system response, just
22 based on heat. And --

23 THE CHAIRPERSON: As a question, please. Is that a
24 question? Or --

25 MR. BENNETT: Q: Just -- everything you're talking
26 about is based on heat. No electrical interaction

1 with different frequencies, different electricity.

2 Isn't that correct?

5 DR. BAILEY: A: I understand that you have a
4 disagreement with Safety Code 6, sir, and --

5 DR. SHKOLNIKOV: A: Actually, let me respond to that
6 statement, and I think this is where we should defer
7 to Safety Code 6 to say what it protects against. It
8 specifically says on page 9 of the standard and 11 out
9 of 30 of the exhibit, which is Appendix B-6, and I am
10 in Chapter 2 or Section 2 of the standard.

11 THE CHAIRPERSON: Mr. Bennett, do you have that in front
12 of you? Because I think it would be useful if
13 everybody was on the same page.

14 MR. BENNETT: Actually, no, I do not.

15 THE CHAIRPERSON: Okay, perhaps you could give that to
16 Mr. Bennett.

17 DR. SHKOLNIKOV: A: So, I am reading third paragraph
18 from the top, which starts with:

19 "For frequencies from 3 to 100 kilohertz,
20 the predominant health effect to be avoided
21 is unintentional stimulation of excitable
22 tissues, since the threshold for
23 electrostimulation in this frequency range
24 will typically be lower than that of the
25 onset of thermal effects."

26 So, taking Health -- you know, as an engineer, reading

1 the standard, it tells me that depending on the
2 frequency, it goes on to describe what happens above
5 100 kilohertz, Health Canada Safety Code 6
4 specifically addresses your concern about stimulation
5 of excitable tissues which would include nerve and
6 cardiac tissues.

7 **Proceeding Time 1:53 p.m. T53**

8 It just goes on to say the predominant fact
9 that higher frequencies is thermal, and therefore to
10 prevent any hazard from exposure, they consider the
11 lowest threshold for adverse effects, which at higher
12 than 100 kilohertz includes thermal effects. But
13 clearly, and I don't -- I'm in agreement with you that
14 depending on the frequency of exposure, Health Canada
15 Safety Code 6 does concern, is concerned about those
16 effects and does explicitly address them as part of
17 the standard.

18 MR. BENNETT: Q: In responding to that I'd just like to
19 say that again, the predominant health effect to be
20 avoided is the unintentional stimulation of excitable
21 tissues. All tissues interacting with these
22 frequencies would be excitable, is that correct?

23 DR. BAILEY: A: Even those cells of the body have an
24 electrical potential across the cell membrane, we
25 ordinarily do not describe cells as being electrically
26 excitable unless they have the characteristics of

1 those cells in the nervous system in which, when you
2 alter the membrane potential, you can trigger an
5 action potential which then travels down axons and
4 causes the release of a neurotransmitter, which then
5 influences another nerve cell.

6 FEMALE VOICE: (inaudible)

7 THE CHAIRPERSON: Ma'am. Excuse me.

8 FEMALE VOICE: (inaudible)

9 MR. BENNETT: Q: And my point to which you referred to
10 there is that making a reference to thermal effects
11 that could be caused by electromagnetic induction
12 inducing currents, high-speed polarization of
13 excitable tissues, in leaving out the electrical
14 information, the neurological stimulation, the immune
15 system responses, is just very limited information.
16 And again, are you aware that, you know, Health -- you
17 know, Safety Code 6 again says that causation,
18 biological plausibility and reproducibility has
19 limited their belief that this is causing adverse
20 health effects?

21 DR. BAILEY: A: For these non-thermal effects, that's
22 their opinion.

23 MR. BENNETT: Q: So, and causality is missing because
24 they're missing -- could the causality be that they're
25 missing an interaction between an intricate electrical
26 system called a human organisms with all those

1 different considerations?

2 DR. BAILEY: A: Sir, it doesn't matter what you
5 speculate about how an interaction might occur. If
4 you expose animals and cells and people to some agent,
5 in this case radio frequency fields, you make those --
6 you observe what the responses are. And you don't
7 have to know what the mechanism is to determine
8 whether you can (a) measure something in a biological
9 system in response, or whether the response you
10 observe is something that can be replicated by
11 scientists around the world. You don't have to
12 speculate about interactions of radio frequency fields
13 with the body. You do experiments to measure those
14 responses if they exist.

15 MR. BENNETT: Q: If you left out mechanisms we wouldn't
16 have electricity.

17 Next one for you with this is -- I'm just
18 going to move on because we've got some area to cover
19 and I just want to hurry in respect to this process.
20 And doesn't including -- doesn't including all of the
21 electrical information associated with human organisms
22 being electromagnetically induced by these high-speed
23 electromagnetic fields substantiate causality?
24 Biological plausibility. Plausibility. And
25 reproducibility.

26

Proceeding Time 1:58 p.m. T54

1 DR. BAILEY: A: I don't believe the scientific evidence
2 supports the kind of inference in your statement, sir.

5 MR. BENNETT: Q: If you incorporate the missing
4 routers, the antennas, FortisBC wants to cover 17,000
5 square kilometres. If you incorporate those routers
6 and antennas, and the fact that humans are electrical,
7 doesn't that bring -- isn't that causality?
8 Biological plausibility? And reproducibility?

9 DR. BAILEY: A: No, sir, that's speculation.

10 MR. BENNETT: Q: It's an electrical reality. Otherwise
11 the devices wouldn't work, you wouldn't be putting the
12 smart meter program.

13 DR. SHKOLNIKOV: A: I think that this is where, for
14 benefit of Dr. Bailey, who doesn't work -- I think
15 what the question is, is if you don't include
16 specifically designed equipment into the system, the
17 Fortis AMI smart meter system will not work, because
18 it needs other information. Is that the question,
19 meaning that it's not -- that you're saying that all
20 the other -- I mean, I'm trying to understand the
21 question. Is it that you need all the different
22 pieces to make the Fortis AMI smart meter work? The
23 advanced meter system?

24 MR. BENNETT: Q: You've got to incorporate 100 trillion
25 cells and a human organism as a whole, every
26 electrical component, are related to orientation of

1 the field, size of the child, an unborn fetus, or a
2 fetus, all the above, you have to incorporate all of
3 the information into that before you can come to a
4 conclusion of any particular kind. You can't leave
5 that out related to safety.

6 DR. BAILEY: A: And do I, sir, understand your position
7 that Health Canada completely did not consider any of
8 these issues that you've just raised?

9 MR. BENNETT: Q: That's actually precisely what I'm
10 saying. And the reason I say it, the reason I can say
11 this to you is this, is that -- Mr. Warren, are you an
12 electrical professional? You understand electricity.
13 Are you an electrical professional?

14 MR. WARREN: A: No, I am not an electrical
15 professional.

16 MR. BENNETT: Q: Mr. Bailey, are you an electrical
17 professional?

18 DR. BAILEY: A: I am just a neurobiologist, sir.

19 MR. BENNETT: Q: Are you a medical professional,
20 doctor?

21 DR. SHKOLNIKOV: A: No, I am an electrical
22 professional.

23 MR. BENNETT: Q: You're an electrical professional.
24 You're not a medical professional.

25 The whole point -- and the reason this was
26 -- did you know that October 28th of 2010, that expert

1 witness was provided -- or, pardon me, a testimony was
2 provided to Canadian Parliament Standing Committee on
3 health related to this issue, incorporating this
4 information, because this takes the scope of every
5 professional involved before you want to think about
6 doing this.

7 THE CHAIRPERSON: That's not a question, Mr. --

8 MR. BENNETT: Q: Yeah. Don't you have to incorporate
9 every professional related to this to have that full
10 opinion related to this?

11 DR. SHKOLNIKOV: A: I'm taking an analogy back to the
12 first question you've asked, which had to do with this
13 figure and these wires. If I were designing in a
14 system -- well, maybe if I'm designing a system, it's
15 not, but normal -- you know, I am obsessed about the
16 microscopic details. But when you design an
17 electrical system, the question you ask, let's say, is
18 the current -- what is the current, what is the
19 voltage, and what is the current I require, what gauge
20 wire I need, what material.

21 If I am designing the circuit, as an
22 electrical professional, I'm not going to ask, you
23 know, questions like what orbitals are occupied on
24 electronic, microscopic level. Because the question
25 in front of me when I design a question is to include
26 all the pertinent information for designing a circuit.

1 the many conductors associated with being a human
2 being.

5 DR. SHKOLNIKOV: A: So if the question is "Can human
4 bodies interfere with a function of AMI meter
5 network?" I think that the question to that is, well,
6 there have been many smart meter and advanced meter
7 installations with humans in the area, and the system
8 continued functioning. If the question is "Has Safety
9 Code 6 considered human bodies as electrical
10 conductors?" the answer is yes, and it specifically
11 has addressed it by looking at the facts of radio
12 frequency signal impinging on a human body and the
13 facts it can have, such as temperature and excitation,
14 and explicitly included those electrical concepts into
15 the design of the standard, although as I have
16 mentioned, Health Canada Safety Code 6 doesn't
17 describe in microscopic details all the interactions
18 that led to the observational variables that they are
19 providing for the purposes of the evaluation.

20 MR. WARREN: A: I need to take exception, Mr. Bennett,
21 with your characterization of us irradiating 17,000
22 square kilometres, and that's -- it's simply a
23 complete exaggeration and an untruth. And what we
24 heard from Dr. Shkolnikov earlier is that the amount
25 of increase in radiation that would result from smart
26 meters is going to be barely perceptible -- the entire

1 smart metering system is going to be barely
2 perceptible over background levels. And that's the
3 truth of the matter. We can exaggerate it all we want
4 but it doesn't change that fact.

5 And you imply that there's some liability
6 associated with that, and that is simply not true
7 either. Like to the extent -- well, I can't say, I'm
8 not a lawyer, but to my knowledge we are not just
9 compliant with all laws and regulations with respect
10 to radio frequency, but we are far, far below those
11 levels. And so I submit it's just not helpful to make
12 those assertions.

13 MR. BENNETT: Q: Is your coverage area 17,000 square
14 kilometers?

15 MR. WARREN: A: That's roughly correct.

16 MR. BENNETT: Q: Are you going to communicate with
17 these wireless devices with these high-speed
18 frequencies over 17,000 square kilometers?

19 MR. WARREN: A: I think we've been very clear about
20 that, yes.

21 MR. BENNETT: Q: Now, well, Doctor here on the end says
22 that the human beings will not interfere with the
23 function of the smart meter infrastructure. The smart
24 meter infrastructure is interfering with the
25 electricity of the humans, the biology in the areas.

26 MR. WARREN: A: We understand that's your theory.

1 MR. BENNETT: Q: There's no theory to electricity, sir.
2 And again I'd like to say this. Mr. Loski --
5 THE CHAIRPERSON: No, just let's ask questions.
4 MR. BENNETT: I'm sorry. Mr. Loski --
5 THE CHAIRPERSON: We're not having an argument about
6 different points of view here.
7 MR. BENNETT: Okay.
8 THE CHAIRPERSON: There is an opportunity at the end of
9 the hearing when we make submissions for you to argue.
10 MR. BENNETT: Okay.
11 THE CHAIRPERSON: This is designed to explore answers to
12 specific questions that you have.
13 MR. BENNETT: Okay, I appreciate that.
14 Q: Did the Doctor already confirm that, you know,
15 electromagnetic induction is science and therefore not
16 assumption?
17 MR. LOSKI: A: You asked me?
18 MR. BENNETT: Q: Just yes or no is fine.
19 MR. LOSKI: A: Yes, he confirmed that induction is a
20 real thing, yes.
21 MR. BENNETT: Q: Isn't my opinion based on science and
22 electromagnetic induction? Just yes or no is fine.
23 MR. LOSKI: A: I can't answer that question. I'm
24 sorry, I don't understand your theory.
25 MR. BENNETT: Q: Mr. Loski, did you know the document
26 that you refer to from Health Canada on the safety of

1 DR. BAILEY: A: I already testified to that, that it is
2 -- that the whole process is critical, and I
5 referenced documents that I believe satisfy that
4 assessment process.

5 MR. BENNETT: Q: If the risk assessment was inaccurate
6 or missing data, wouldn't that affect the risk?

7 DR. BAILEY: A: Sir, I don't know that those agencies
8 are missing data in their review of the potential
9 health effects of radio frequency fields.

10 MR. BENNETT: Q: As Mr. Loski said, isn't Health Canada
11 the governing authority related to this?

12 DR. BAILEY: A: Sir, the reviews that I'm talking
13 about, I referenced, are those that are not setting
14 standards, that are going through and reviewing the --
15 all of the scientific evidence and coming up with a
16 conclusion about what are the types of exposures and
17 their potential risks associated with that.

18 That information is similarly reviewed, we
19 understand, by Health Canada and then they take that
20 information and design a standard to protect against
21 established adverse health effects. So, in addition
22 to Safety Code 6, we directed readers to other
23 documents that do provide a much more detailed and
24 thorough human health risk assessment and if you read
25 them, will address many of the questions that you have
26 at the electrical level, at the level of exposure, and

1 also at the biological level.

2 MR. BENNETT: Q: Well, as an author of that document,
3 can you refer me to where they talk about the
4 electrical properties of humans? The orientation of
5 these fields? And all the electrical properties of
6 humans.

7 DR. BAILEY: A: Let the record reflect that I am
8 referring to the document that human -- "Health
9 effects from radio frequency electromagnetic fields"
10 report of the Independent Advisory Group on Non-
11 Ionizing Radiation dated 2012, and if somebody could
12 help me, give me the exhibit reference for that, we'll
13 make sure it's in.

14 But if you go to Chapter 2, there is a
15 whole chapter titled "Exposures, interaction
16 mechanisms, dosimetry and sources." It starts out
17 talking about characteristics of radio frequency
18 fields. It talks about wave forms, including
19 modulation and pulsing, signal fading, fading,
20 source-dependent considerations, exposure to RF
21 fields, measurement of electromagnetic fields, and
22 then it goes on and deals with interaction mechanisms.

23 It then goes in the next subsection, 2.3,
24 into radio frequency dosimetry and under that, it
25 talks about the valuation of SAR, how it's modeled,
26 the dielectric properties of tissue, the age-

1 dependence of dosimetry, for head, whole body
2 exposure, the fetus. It talks about measurement
5 limitations.

4 **Proceeding Time 2:13 p.m. T57**

5 And then there is in Section 2.4 sources of
6 radio frequency fields, there is a very extensive
7 discussion of the natural background fields from
8 broadcasting wireless telecommunication, industrial
9 applications, medical applications, security and
10 navigation applications. All of this is some 70 pages
11 of preface before any discussion of the biological and
12 human studies is discussed.

13 MR. BENNETT: Q: I didn't hear your reference there to
14 the frequency modulation of human organisms. Where is
15 that located in there?

16 DR. BAILEY: A: There is a -- there is a discussion in
17 the biological section in which the frequencies of the
18 body in terms of the nervous system are addressed.

19 MR. MACINTOSH: Just for the record, Mr. Chair, the
20 document that Dr. Bailey has been referencing is
21 Exhibit B-42.

22 THE CHAIRPERSON: Thank you.

23 MR. BENNETT: Q: And I can read that and look -- like
24 you said, provide something in there.

25 MR. BENNETT: Q: For the record, Doctor, you know,
26 prior to consulting on the E^xponent Report, were you

1 aware that the routers were left out of discussion,
2 the electrical properties were left out of codes, the
3 Safety Code 6 did not incorporate the routers, the
4 means of this whole wireless circuit? Safety Code 6
5 did not incorporate human electrical properties. Were
6 you aware of that prior to consulting on the report?

7 MR. MACINTOSH: Mr. Chair, I object, only because this
8 topic has been covered four or five times, and the
9 response has been that Safety Code 6 isn't aimed at
10 the particular materials -- or equipment that is
11 giving rise to the emissions. It instead is measuring
12 the emissions and determining their safety or their
13 health.

14 THE CHAIRPERSON: I agree. You've approached this topic
15 and received numerous answers on it.

16 MR. BENNETT: No, I just wanted to know if he knew that
17 this information was missing prior to consulting on
18 the report.

19 THE CHAIRPERSON: Well, except I think the way you've
20 posed the question was not informed by the information
21 you received previously.

22 MR. BENNETT: Okay.

23 MR. BENNETT: Q: So you did take into consideration the
24 frequencies of the smart meter interaction with
25 different frequencies associated with cells,
26 neurological function, overall biological function?

1 DR. BAILEY: A: That's correct.

2 MR. BENNETT: Q: And those calculations again are in
5 your report, your E^xponent Report?

4 DR. BAILEY: A: In my evaluation of the literature I
5 consider all these things. The purpose of the
6 document we presented was not to duplicate from the
7 type of review that the AGMAR produced for the Health
8 Protection Agency. It was to provide a shorter
9 overview of the topic, not a detailed risk assessment.
10 But I did reference those detailed risk assessments in
11 our report.

12 MR. BENNETT: Q: Did your report also make reference
13 to, you know, okay, the HAN and ZigBee function, the
14 home access network and the ZigBee function, the
15 future considerations for the homeowner to include
16 several wireless devices inside the home? Is there an
17 estimated number of home many wireless devices they're
18 talking about for power safety?

19 MR. WARREN: A: No, although I seem to recall this was
20 discussed earlier, but we haven't -- we have no
21 estimate of what the uptake might be, other than 30
22 percent -- I believe there was a 30 percent
23 penetration of IHDs, subject to check, over the study
24 period of the report.

25 MR. BENNETT: Q: Has the E^xponent Report considered risk
26 assessment with the installation of each and every

1 separate smart device put inside the building?

2 DR. BAILEY: A: That's not the goal of our particular
5 report. That's an entirely separate issue.

4 MR. BENNETT: Q: Doesn't the smart meter have two
5 frequencies? One the 900 megahertz and the other one
6 is the ZigBee?

7 DR. SHKOLNIKOV: A: Yes, and exposure for both was
8 actually part of the report. There is a separate
9 calculation for the ZigBee component and a separate
10 one for LAN, and the Industry Canada document -- or
11 the FCC document introduced yesterday has actually
12 confirmed compliance with Safety Code 6. So both of
13 those devices turned on and communicating
14 continuously.

15 **Proceeding Time 2:17 p.m. T58**

16 MR. BENNETT: Q: Okay. Has the E^xponent Report
17 considered the risk assessment of every device that's
18 going to be put in the home, the orientation of the
19 electromagnetic fields from every device and the
20 physiological differences between each occupant?

21 DR. BAILEY: A: We did not address any site-specific
22 issues. We addressed interactions of radio frequency
23 fields with organisms on a general basis that is
24 appropriate to, for instance, addressing whether the
25 fields in a more general sense, not in a site-specific
26 sense, would be effected by radio frequency field.

1 DR. SHKOLNIKOV: A: And I would like to add that, at
2 least in United States, every device before being sold
5 -- or used or imported in the country, has to be
4 individually evaluated for compliance with the
5 exposure limits. So even if devices are added to the
6 household network, and again that's why -- it's not a
7 topic of the report we've written. I would assume
8 that those would be tested to comply with Safety Code
9 6 limits.

10 MR. BENNETT: Q: Based on heat.

11 DR. SHKOLNIKOV: A: Based on the compliance
12 requirements of Safety Code 6 and Industry Canada RSS
13 102.

14 MR. WARREN: A: I should point out as well that with
15 respect to the ZigBee devices at least, that there's
16 -- although we haven't projected any particular
17 penetration of those, that home automation devices
18 aren't -- the use of home automation devices won't --
19 will happen regardless of whether or not we install an
20 advanced metering infrastructure. There's many ways
21 that customers can perform those kind of functions.
22 The ZigBee network that we're talking about, which is
23 -- I remind everybody, entirely optional, as to
24 whether it's turned on. Simply provides a little bit
25 more information into a home area network in terms of
26 pricing and consumption information.

1 Whether or not we install this project,
2 lots of customers will want to take advantage of home
3 automation for controlling their energy use, and they
4 don't need -- they don't need this system to do that.

5 MR. BENNETT: Q: Well, do the frequencies from the
6 ZigBee -- pardon me, do the ZigBee frequencies go
7 through walls?

8 MR. WARREN: A: Well, that's our hope, because they
9 won't be able to communicate with the devices
10 otherwise.

11 MR. BENNETT: Q: Doesn't it contradict, you know,
12 earlier evidence provided that, you know, these
13 frequencies weren't penetrating far into the wall
14 system to effect, perhaps, a vulnerable baby?

15 MR. WARREN: A: I'm sorry, I don't understand the
16 question.

17 MR. BENNETT: Q: Well, we're talking about smart meter
18 frequencies in the meter -- the meter itself, just as
19 an end-use device, reflecting the frequencies away
20 from the building, it wasn't penetrating the building
21 very far.

22 MR. WARREN: A: Yes, certainly there's some attenuation
23 of the signal from the meter by walls and that sort of
24 thing. So yeah, the signal gets weaker as it goes
25 through different media.

26 MR. BENNETT: Q: So is it a good idea to attenuate part

1 of the frequencies from the smart meter itself, but
2 then put in a 2.4 gigahertz frequency that's going to
3 go through walls and roofs and it's designed to
4 communicate throughout the building?

5 MR. WARREN: A: Is it a good idea? Yes, I think it's a
6 good idea to put in a ZigBee radio into the meters.
7 It provides customers with additional information if
8 they want it, and for use in their home.

9 MR. BENNETT: Q: Don't you think it's a contradiction
10 to talk about penetration inside the home being
11 minimal and then installing frequencies inside the
12 home throughout?

13 MR. WARREN: A: No, I don't.

14 MR. BENNETT: Q: So one -- with the frequencies from
15 the meter you relate to -- are you relating to -- they
16 do not penetrate the home very much. They're
17 reflected away from the home.

18 **Proceeding Time 2:22 p.m. T59**

19 MR. WARREN: A: All we were saying, sir, is that
20 signals from the meters will be attenuated to some
21 degree by the various components of the house and the
22 back of the meter base and that sort of thing.
23 Doesn't mean that there's no signal. It just means
24 the signal is reduced.

25 DR. SHKOLNIKOV: A: And if you would like more
26 information, this is -- I can ask this to be

1 introduced. This is one of the standard references
2 for losses by going through building materials. I
3 keep this around because of wireless networks that I
4 work with, which operate at 2.4 gigahertz, same as
5 ZigBee, and it lists the losses or reduction in a
6 signal depending on the material used as part of the
7 building material. So it is a well known fact that
8 basically all radio frequency signals do get
9 attenuated as it goes through the building.
10 Attenuation does depend on the frequency.

11 So the losses for 900 megahertz and 2.4
12 gigahertz are going to be different utility for the
13 function of the network both would have to be able to
14 go to -- you know, get to the destination they're
15 intended to go to.

16 MR. BENNETT: Q: Precisely. That you've got to have
17 2.4 gigahertz from the meter communicate with 2.4
18 gigahertz devices inside the building, is that
19 correct?

20 DR. SHKOLNIKOV: A: Yes, but I think that the question
21 is -- the question is, what is the exposure from those
22 signals, and the answer is yes, there's communication,
23 but the exposure is reduced by signal passing through
24 the wall material.

25 MR. BENNETT: Q: So just electromagnetically induce
26 people just a little bit?

1 DR. SHKOLNIKOV: A: All I'm saying is that if you were
2 to estimate, depending on the building material,
3 you're starting at about one/ten-thousandths of the
4 Safety Code 6 in front of the smart meter. When you
5 go through building materials, you know, SEC exhibit
6 has also shown the signal drops as it enters a house
7 to reduce exposure even further, and Mr. Weafer's
8 exhibit, you know, assumed that that reduction would
9 lead to one millionth of a signal getting in instead
10 of one/ten-thousandths of a -- sorry, one/ten-
11 thousandths of Safety Code 6 limit going in.

12 MR. BENNETT: Q: But that's just referencing the meters
13 and end-use device, not the routers or antennas
14 communicating -- are the routers and antennas,
15 whatever that infrastructure might be, communicating
16 with the meter hitting the building from top to
17 bottom?

18 MR. WARREN: A: Dr. Shkolnikov referred to this
19 earlier, and so if you assume that the meters are at a
20 half a meter away, are a thousandths of the Safety
21 Code 6 limit, and you assume that you're -- although
22 this isn't possible, that all the other meters are
23 also within half a meter of you and the collectors
24 within half a meter of you, which is not a physical
25 possibility, but make that assumption, you'd be fine
26 until there were 1,000 devices there.

1 In realty, of course, these devices are
2 much -- like there might be one that's that close to
3 you, but there won't be -- there won't be more than a
4 very few. And as you're aware, the signal strength
5 drops off very quickly as they move away. It drops
6 off of the square of the distance that they are away
7 from you. So, there is no way that the additive
8 effect, and I'll ask Dr. Shkolnikov to confirm that,
9 can add up to anything that would even vaguely
10 approach Safety Code 6 limits.

11 MR. BENNETT: Q: Signal strength dropping off referring
12 to power density, not the frequencies dropping off.

13 MR. WARREN: A: That's correct.

14 MR. BENNETT: Q: Part IV of B.C. Building Code is
15 related to we design buildings for vibration. These
16 frequencies going -- are buildings -- did you run this
17 by the regulatory process in B.C. to find out about
18 the high speed vibration of buildings?

19 MR. WARREN: A: Well, we answered an IR on this, if you
20 recall, Mr. Bennett. In Exhibit B-11, an IR from
21 yourself, so WKCC IR No. 1, question 4, and our
22 response, and I'll read it for you,

23 "B.C. building code 4.1.3.6 deals with
24 physical vibrations, not photon oscillations
25 of electromagnetic nature. Radio frequency
26 will not cause any physical vibrations that

1 DR. SHKOLNIKOV: A: Well, considering the routers, the
2 pressure from electromagnetic fields depends on their
5 intensity, and those routers are much farther away. I
4 would assume that the added pressure from those
5 signals would probably drop below the level of a
6 whisper.

7 MR. BENNETT: Q: Can you answer your cell phone inside
8 a building?

9 DR. SHKOLNIKOV: A: Yes.

10 MR. BENNETT: Q: And the frequencies are going through
11 the walls, is that correct?

12 DR. SHKOLNIKOV: A: That is correct, yes.

13 MR. BENNETT: Q: At a molecular level don't you have a
14 high speed oscillation at twice the speed of the
15 frequency, which would be 1.8 billion times a second?

16 DR. SHKOLNIKOV: A: My human body, because I am alive,
17 would have oscillations going up to 10 to the 12 and
18 higher frequencies, much higher than that, from the
19 cell -- radio signals from the AMI advanced meters.

20 MR. BENNETT: Q: You're not running through the walls,
21 are you?

22 DR. SHKOLNIKOV: A: No, and I --

23 MR. BENNETT: Q: If you shook a piece of drywall 1.8
24 billion times a second, where it's trying to polarize
25 or oscillate 180 degrees, at a molecular -- at a
26 molecular level, at an atomic level, isn't that going

1 to have an impact on structural components or fire
2 separations?

5 DR. SHKOLNIKOV: A: Those are experiments of what
4 happens to materials exposed to RF signals, have been
5 performed. I mean, I would say if you put your cup to
6 boil the water and ignoring the dielectric heat --
7 heating of the water that causes it to boil and you
8 look at the cup, it is exposed to 2.4 billion
9 oscillations per second for duration of one or two
10 minutes at power levels exceeding -- you know, inside
11 a microwave oven, exceeding that from the smart meter
12 -- or advanced meter by, you know, at least 10 to the
13 4th if not higher. Probably more -- a million times
14 greater. and yet when you take that cup out it may
15 feel warmer but it does not disintegrate in your hands
16 as you take it out.

17 MR. BENNETT: Q: Did you get compression -- did you or
18 FortisBC get compression strength tests from engineers
19 to validate the safety of that?

20 MR. WARREN: A: No, we didn't.

21 DR. SHKOLNIKOV: A: I would point out that the
22 structural material strength of something like
23 aluminum which is weakly structural 70 gigapascals,
24 and the density -- the force from the human voice is
25 about 20 pascals, and the pressure from the advanced
26 meter network, as I just calculated, is a million

1 times below that.

2 So, I think as -- you know, when I took
3 courses in structural materials, you try to understand
4 whether certain forces can have an effect on
5 structural material and because there's such a huge
6 ratio of, you know, 10 to the 9 or greater, actually
7 much much larger, you know, disparity between the
8 strength of material and the force, I can't see how
9 the yield strength or the strength of structural
10 material in a building could be even approached by the
11 pressure from the advanced meter signal.

12 MR. WARREN: A: And I would point out as well, from a
13 practical perspective, that there are hundreds of
14 millions of wireless devices in North America alone,
15 that are transmitting on very similar frequencies to
16 these meters, and to the best of my knowledge
17 buildings aren't falling down. And so I think we can
18 take comfort from that.

19 MR. BENNETT: Q: To the best of your knowledge in what
20 capacity is that?

21 MR. WARREN: A: I'm just saying as a lay person.

22 MR. BENNETT: Q: As a lay person.

23 MR. WARREN: A: That's right.

24 MR. BENNETT: Q: And did you know that buildings are
25 engineered in an intricately designed process as well?

26 MR. WARREN: A: Yes.

1 MR. BENNETT: Q: Do you know we like them to stand up
2 for a long time?

5 **Proceeding Time 2:33 p.m. T61**

4 MR. WARREN: A: I agree.

5 MR. BENNETT: Q: Did you know that we consulted on a
6 tower here in Kelowna that's 20 storeys high, and
7 based on the structural engineer's questions about the
8 smart meters being put inside the building, that we
9 told him in time we would fail his building?

10 MR. WARREN: A: I would entirely say that is
11 unreasonable.

12 MR. BENNETT: Q: You know, if I can say this in a
13 question, do you know that I have a crappy job
14 sometimes representing science in the work that we do?

15 MR. WARREN: A: I do not know whether that's true.

16 MR. BENNETT: Q: It's just true, but did you know that
17 what I'm representing to you is an electrical and
18 atomic and molecular reality, part of the basics of
19 science?

20 THE CHAIRPERSON: Mr. Bennett, please proceed with your
21 questions.

22 MR. BENNETT: Q: Does Fortis plan to get that
23 information to make homeowners more comfortable on the
24 interaction of these frequencies with their buildings,
25 potentially making them non-compliant with *Building*
26 *Code*?

1 MR. WARREN: A: No.

2 MR. BENNETT: Q: Don't you think that that would be a
5 good idea?

4 MR. WARREN: A: No, I don't.

5 MR. BENNETT: Q: Do you think that considering that Mr.
6 Coleman is not responding to his own professionals
7 related to the issue with any potential liabilities,
8 it would in your best interest to get the Minister to
9 get them to do some tests?

10 MR. WARREN: A: No, I do not think that would be a good
11 idea.

12 MR. BENNETT: Q: And you're prepared to take on that
13 financial liability of all people's homes in that
14 17,000 square kilometre area.

15 MR. LOSKI: A: Let's just step back from this for a
16 moment, if I can. What we need to do with the AMI
17 project is to ensure that we're in compliance with
18 Safety Code 6, and indeed our meters will be.
19 Additionally we, through all of our operations, need
20 to ensure that we are compliant with all applicable
21 legal frameworks and statutes and regulations, and we
22 do, and we will continue to do so.

23 So some assertion here that you're making
24 here that we're not going to be because of the science
25 as you're suggesting it will work, is beyond what we
26 need to -- or is not something there that we can look

1 at in this hypothetical sense and, you know, other
2 than to say that because we are in compliance, we
3 expect that there will not be any liabilities flowing
4 from that.

5 MR. BENNETT: Q: As a B.C. and nationally credentialed
6 electrical professional installing the products that
7 you produce called electricity, do you tell your
8 customers that theoretically, you know, we'll get our
9 jobs done?

10 THE CHAIRPERSON: Mr. Bennett, I'm not sure that this
11 line of questioning is all that informative.

12 MR. BENNETT: Okay, I know, I truly, sir, with great
13 respect to due process, is, you know, I just want to
14 just -- I'll just say that I'll move on with the
15 questioning. I disagree with -- I disagree with these
16 responses supporting this program.

17 MR. BENNETT: Q: Okay, just another thing. Is it true,
18 in order for the radio frequency EMFs to interact with
19 human organisms, that frequencies have to hit people?
20 If they don't hit you it's not a deal, is it?

21 DR. BAILEY: A: If you're not exposed, then there's no
22 potential for interaction.

23 MR. BENNETT: Q: But if you live in the 17,000 square
24 kilometres of their coverage area, you're going to be
25 hit by the frequencies.

26 DR. BAILEY: A: Yes, as we are by radio frequencies

1 from the earth, other people, and even coming from
2 outer space.

5 MR. BENNETT: Q: Can I refer you to, I think, you might
4 have the document with you. It's C19, Exhibit C19-6,
5 page 4.

6 DR. SHKOLNIKOV: A: Just to confirm, this page over
7 here?

8 MR. BENNETT: Q: Yes.

9 DR. SHKOLNIKOV: A: Thank you.

10 MR. BENNETT: Q: Now, are you aware the image on the
11 left is -- the picture on the left is San Phantom
12 model. That's an example of the science used for the
13 specific absorption rate.

14 **Proceeding Time 2:38 p.m. T62**

15 DR. SHKOLNIKOV: A: It appears to be a phantom,
16 although from the resolution of this image I can't
17 distinguish if it's a San Phantom or another phantom.

18 MR. BENNETT: Q: Precisely. Did you know that the
19 application that you're supporting here only used that
20 -- only used that model for the safety and health
21 safety of everybody in the field?

22 DR. SHKOLNIKOV: A: I don't believe SAM-based SAR
23 testing was performed in this program, as I have
24 introduced into exhibit yesterday. The specific
25 testing was with respect to maximum permissible
26 exposure, which was a measure of power density, which

1 would not utilize a phantom model. And the pictures
2 of that setup are -- were introduced as an exhibit.

5 MR. BENNETT: Q: The picture on the right side at the
4 top of the page is B.C. Hydro's illustration of their
5 smart grid.

6 DR. SHKOLNIKOV: A: It would appear to be so, yes.

7 MR. BENNETT: Q: Don't you think that's significant,
8 that that information was left out of safety of -- or
9 the limits of human exposure to these frequencies?

10 DR. SHKOLNIKOV: A: I would imagine that it would be
11 improper for FCC to include information about
12 different systems in evaluation -- about specific
13 systems in application, because the process is for
14 licensing specific devices rather than installations.

15 MR. BENNETT: Q: You'd be right, but putting in there
16 the fact that you're -- you are radiating large
17 geographical areas, being left out of a scientific
18 equation is something of concern.

19 DR. SHKOLNIKOV: A: Well, I think there is a question
20 of terminology. Your cell phone that you use, and the
21 laptop that you have, have a transmitter in there.
22 Your cell phone can communicate over many, many miles
23 of distance. So your cell phone could be calling --
24 talking to a tower ten miles away. But we don't talk
25 about cell phone irradiating ten mile radius distance.
26 The question here is, what is the exposure at the

1 specific point and how does it relate to Safety Code
2 6?

5 MR. BENNETT: Q: Did you know the Texas Public
4 Utilities Commission in their safety sheet says that
5 ten feet from the smart meter makes you safe? From
6 the frequencies. Did you know that?

7 DR. SHKOLNIKOV: A: I don't know that. I don't.

8 DR. BAILEY: A: And I haven't seen that.

9 DR. SHKOLNIKOV: A: And I would point out that the
10 terminology would have surprised me, because the
11 measurement of exposure is in units of power density,
12 not in units of frequency.

13 MR. BENNETT: Q: Yeah. Well, they just referred to,
14 you know, ten feet from the meter making you safer.
15 From exposure to these frequencies. Did you know that
16 --

17 MR. LOSKI: A: Sorry. Just for clarity, was that from
18 the Texas Public Utilities Commission?

19 MR. BENNETT: Q: Yes.

20 MR. LOSKI: A: I can't remember the exhibit here, but I
21 find that difficult to believe in that I believe we
22 had filed a report from the staff of the Texas Public
23 Utilities Commission that -- in the absence of having
24 it in front of me, but the staff concluded that
25 advanced meters were safe.

26 MR. BENNETT: Q: Advanced meters were safe as an end

1 use device. Do you know that -- did you know that --
2 MR. LOSKI: A: So, my presumption, of course, here, and
3 if we can get the report, but the -- you know, when --
4 the same as here in the case of the AMI project that
5 we're proposing, we're saying that the project in its
6 totality, if you want to think of it that way, so,
7 inclusive of the other devices, meets and is
8 significantly below the requirements of Safety Code 6.
9 And again, I would think that that was the case with
10 the Utilities Commission staff from Texas.

11 MR. BENNETT: Q: Did you know that the Texas Utility
12 Encore, through their lawyer, admitted that -- or
13 stated that the average geographical coverage area of
14 a smart meter router was 5 square miles? Had a
15 collector 125 square miles.

16 **Proceeding Time 2:42 p.m. T63**

17 MR. LOSKI: A: I can't corroborate that or not.

18 MR. BENNETT: Q: Is 10 feet going to make you safe if
19 you're in the coverage area?

20 MR. WARREN: A: Yes, it will. With the FortisBC smart
21 meters, you're safe even at 20 centimeters.

22 MR. BENNETT: Q: Even at 20 centimeters, but you're
23 radiating the rest of the areas talking to those
24 meters, and somehow you're immune to those
25 frequencies? The meters as an end use device are one
26 consideration in this application. You have to

1 consider the rest of the wireless circuit. Or
2 wouldn't you have to consider the rest of the wireless
5 circuit communicating with those meters?

4 MR. WARREN: A: When we've talked today and we've
5 talked in the past about the cumulative exposure from
6 multiple meters, and we've asserted that they're still
7 far below Safety Code 6 levels.

8 MR. BENNETT: Q: And so, and I'll deal with this, I
9 guess, later on. Go ahead.

10 DR. SHKOLNIKOV: A: I would like to address this
11 question, I think, again. There was a confusion
12 between ability to receive a signal and safety. So
13 for comparison, GPS satellites are in air about 36,000
14 kilometres in the air, and their total transmission
15 power is roughly 20 to 50 watts depending on the
16 satellite you're talking about. Yet here, 35,000
17 kilometres below, you can still receive the signal.
18 The ability to receive a signal at a large distance is
19 a miracle of modern communication systems. This cell
20 phone can receive one ten-millionth of one milliwatts
21 and still allow you to converse with it. And I'm
22 talking receiving from the towers.

23 So there is a difference between a
24 specially design device specifically tuned to one
25 frequency receiving a signal and completely
26 optimizing, free of responsibility for biological

1 function of the system, designed to receive a signal
2 -- and this phone can also receive a GPS signal if I'm
5 not indoors; and the exposure assessment which relate
4 to the facts on health, which are covered by Safety
5 Code 6.

6 And if you look -- an example of this is
7 that the requirements for interference are much much
8 tighter than the requirements for exposure, because a
9 device that will not force you to exceed Safety Code 6
10 is perfectly capable of disrupting a communication or
11 a very large area, and therefore there is a separate
12 test.

13 If the Safety Code 6 was designed to -- if
14 the Safety Code 6 was enough to guarantee there was no
15 interference or no communication, then all the
16 manufacturers would be quite happy to test just to RSS
17 102. But they're required to consider a battery of
18 tests that are quite extensive that are required in
19 RSS 210, which is an interference standard, because
20 there's an understanding that in the modern
21 communication world you can receive signals that are
22 well below what is biologically relevant.

23 MR. BENNETT: Q: I can say that I'm a lover of
24 technology, but at the same time I have to
25 professionally represent that while we're using these
26 signals and these applications, the rest of everything

1 in existence, both atomically and molecularly, is not
2 designed for these frequencies.

5 DR. SHKOLNIKOV: A: If you're saying that human beings
4 weren't designed to receive 900 megahertz frequency,
5 that is correct. That is why, when the signal falls
6 below a certain signal -- and I'm speaking from an
7 engineering point of view -- if you were to
8 instrument a human body and look at the facts of the
9 signal, below a certain level you'd find none. So
10 that is correct. If a creator or whatever your
11 belief is were to design a human body to receive 900
12 megahertz signal, then this would be a different
13 topic because I would be worried about interference
14 of 900 megahertz with a human body if it were
15 intended to receive it.

16 And I think that's kind of the point. The
17 human body is not intended to receive 900 megahertz
18 signal, and it doesn't. It basically has no
19 biological effect on it because it has no function in
20 a human body, and the effects of it are below the
21 biological relevance, at least according to the
22 analysis that Dr. Bailey has presented.

23 DR. BAILEY: A: Let me give you another biological
24 example here. Through evolution the human body has
25 evolved very specialized sensors to detect a variety
26 of events, as it were, in the environment. And so

1 the retina of the eye has evolved to be able to
2 detect certain frequencies of electromagnetic fields
5 within a range of what we call visible light. And
4 the very fact that we have this very specialized
5 sensor system, which at best can detect one photon of
6 light, is specifically designed to detect and amplify
7 signals in this frequency range.

8 **Proceeding Time 2:48 p.m. T64**

9 But when you have your cell phone near you,
10 or other radio frequency sources, it doesn't interfere
11 with this signal processing of this specialized
12 receptor. So here is an example whereby the -- our
13 ability to detect electromagnetic fields in this
14 frequency range is unaffected by radio frequency
15 fields in -- from a variety of sources, does not
16 impair our vision or cause any kind of significant
17 interference.

18 MR. BENNETT: Q: Aren't you talking about -- when you
19 talk about our ability to see these -- use these
20 electromagnetic fields, you're talking about natural
21 electromagnetic fields, not man-made.

22 DR. BAILEY: A: I'm saying these man-made
23 electromagnetic fields in the radio frequency region
24 do not impair our detection of electromagnetic fields
25 in the region of visible light.

26 MR. BENNETT: Q: You've got -- isn't it true that

1 wrapping up at 4:00 today. Thank you.

2 MR. BENNETT: Absolutely.

5 Q: Mr. Loski, is Fortis aware that Health Canada has
4 retained an independent, independent expert panel to
5 review Safety Code 6?

6 MR. LOSKI: A: Are you referring to the Royal Society
7 review?

8 MR. BENNETT: Q: Yes.

9 MR. LOSKI: A: Yes, and we talked about that this
10 morning.

11 MR. BENNETT: Q: Okay. Are you aware, are you aware
12 that the errors or omissions that were missing in
13 Safety Code 6, including the frequencies from the
14 towers, the routers, the cumulative effects, the
15 electrical information, the biological interaction, is
16 going to be incorporated in this new process?

17 MR. LOSKI: A: With respect to the emissions that you
18 were talking about, I know that that was discussed at
19 length with Dr. Shkolnikov, and I don't think the way
20 you're characterizing there represents the evidence
21 that Dr. Shkolnikov testified to.

22 MR. BENNETT: Q: Naturally. Do you understand that the
23 errors or omissions in Safety Code 6 were reported to
24 Health Canada in September 2010, yes or no?

25 MR. LOSKI: A: Are you referring to when you presented
26 information at the standing committee?

1 MR. BENNETT: Q: No, that was prior to that.

2 MR. LOSKI: A: I'm not sure what you're alluding to,
5 and again, based on --

4 MR. BENNETT: Q: Just are you aware?

5 MR. LOSKI: A: Well, I said I'm -- if I can finish,
6 please. I'm not sure what you're alluding to, and
7 based on what I've heard Dr. Shkolnikov say is that
8 there aren't these errors and omissions that you're
9 asserting.

10 MR. BENNETT: Q: And so you're also aware that on --

11 MR. LOSKI: A: I'm not also aware. I just said that I
12 wasn't aware of that.

13 MR. BENNETT: Q: Okay, I'm off to something different
14 now if you just let me finish that part, please. On
15 October 28th at the request of Canadian Parliament
16 Standing Committee on Health, I provided evidence at
17 their request related to those errors or omissions.
18 Are you aware of that?

19 MR. LOSKI: A: I am aware that you testified, I guess,
20 if that's the right word, no disrespect, but in front
21 of that standing committee.

22 MR. BENNETT: Q: And are you aware that Health Canada
23 Safety Code 6 states that any new peer-reviewed
24 science coming in, they will adapt the code, they will
25 deal with that issue? Are you aware of that?

26 MR. LOSKI: A: I know that I -- I don't know if that's

1 the case and Dr. Bailey can elaborate. I do know that
2 Health Canada in its documentation says that it on an
3 ongoing basis reviews and monitors the relevant
4 science.

5 MR. BENNETT: Q: Are you aware that, you know, Health
6 Canada's administration dismissed electromagnetic
7 induction as peer-reviewed science, and human
8 biological being electrical?

9 MR. LOSKI: A: I believe you talked to Dr. Bailey and
10 Dr. Shkolnikov about that --

11 MR. BENNETT: Q: I'm just asking you.

12 MR. LOSKI: A: -- and so based on the best evidence
13 available to me, it's what I heard, what I've heard
14 from Dr. Bailey and Dr. Shkolnikov.

15 MR. BENNETT: Q: Did you hear any of that information
16 from MP Ron Cannon, or MLA Ron, or what's his name,
17 Norm Lutnik, the City of Kelowna, or any of the
18 ministers provincially?

19 MR. LOSKI: A: I haven't spoke with those individuals.

20 **Proceeding Time 3:07 p.m. T67**

21 MR. BENNETT: Q: Okay. Are you aware that the
22 recommendations in the report of the standing
23 committee was the Health Canada -- the NDP, in their
24 supplementary report, specifically asked Health Canada
25 to thoroughly investigate those errors or omissions
26 reported in Safety Code 6. Just, are you aware of

1 them? What they did is what they did.

2 MR. LOSKI: A: I'm not aware of that.

5 MR. BENNETT: Q: And that was in December of 2010 when
4 that report came out. Mr. Bailey, or Dr. Bailey, what
5 are continuing education credits? Medical, CMA
6 credits?

7 DR. BAILEY: A: In many jurisdictions there is a
8 requirement that physicians take a certain number of
9 hours of additional medical training in order to
10 maintain their qualifications.

11 MR. BENNETT: Q: Are those -- oh, okay, I'm sorry.

12 DR. BAILEY: A: And those are commonly referred to as
13 CMEs.

14 MR. BENNETT: Q: And aren't they a requirement for
15 ongoing medical licensing?

16 DR. BAILEY: A: That's what I just said.

17 MR. BENNETT: Q: Okay. So, would you -- would you
18 agree that anything taught or lectured within that --
19 at that level of education would be considered
20 education, pure -- accepted medical education?

21 DR. BAILEY: A: You know, I don't -- that's a very
22 general question. I don't know the specifics of what
23 might be offered in any particular course. I'm sure
24 that they're -- for educational purposes that you
25 could get credit for finding out additional
26 information about a wide variety of things that might

1 be relevant to a physician.

2 MR. BENNETT: Q: But it is -- if programs were approved
3 for lecturing by the American Academy of Family
4 Physicians, Boards of Medicine, Boards of Dentistry,
5 Boards of Nursing, at state levels, it would be just
6 fair to even assume that, you know, that being
7 acceptable or accepted medical education would be
8 acceptable medical education.

9 DR. BAILEY: A: Again, sir, I don't know any specifics.
10 You're not giving me any specifics here. So, I
11 wouldn't know whether something was appropriate or not
12 until I had reviewed it.

13 MR. BENNETT: Q: And are you aware that, you know, the
14 integrated health forum -- I'm not sure about the
15 global education development institute there, 15,000
16 licensed health professionals, had a program where the
17 dangers of these frequencies and these errors or
18 omissions that I'm referencing to, was lectured in
19 medical education at the University of Central
20 Florida, in January of 2011.

21 DR. BAILEY: A: I did not know that, sir.

22 MR. BENNETT: Q: Did you know that that program, not
23 just being applicable to 105,900 associated with the
24 American Academy of Family Physicians, that this is
25 also recognized in North America?

26 DR. BAILEY: A: I don't have any reason to dispute

1 MR. BENNETT: Q: Is medical education a position paper?
2 DR. BAILEY: A: I don't know what was presented, sir,
5 so I can't tell you.
4 MR. BENNETT: Q: Is medical education, is medical
5 academia a position?
6 DR. BAILEY: A: I was referring, sir, to the statements
7 of the AAEM and the pediatrician's statement.
8 MR. BENNETT: Q: Isn't it reasonable to conclude that
9 medical professionals aren't electrical professionals
10 and vice versa, and that this is effectively -- hasn't
11 this changed the scope of diagnosis, having causality,
12 biological plausibility and reproducibility with the
13 information that's been left out?
14 DR. BAILEY: A: Sir, I frankly don't understand that
15 question at all.
16 MR. BENNETT: Q: You know, you did a -- your risk
17 assessment was based on heat effect. How many
18 diagnoses [sic] have you heard a doctor make where
19 you're suffering from thermal effects?
20 DR. BAILEY: A: My report was not based just upon a
21 consideration of thermal effects alone. And second of
22 all, I did not get involved in clinical matters.
23 MR. BENNETT: Q: Okay. But you still agree that, you
24 know, your risk assessment related to this was really
25 complete?
26 DR. BAILEY: A: For the purposes it was presented for,

1 it is.

2 MR. BENNETT: Q: And leaving out all that electrical
5 information without even calculations associated --

4 THE CHAIRPERSON: Mr. Bennett.

5 MR. BENNETT: Okay.

6 THE CHAIRPERSON: We've been through that topic --

7 MR. BENNETT: Okay, good, good, good, listen, I
8 apologize, sir.

9 THE CHAIRPERSON: -- a number of times, okay?

10 MR. BENNETT: I apologize, sir.

11 THE CHAIRPERSON: I think you did a good job of covering
12 it when you did.

13 MR. BENNETT: No, I appre- -- and again, really with
14 great respect to everybody, that it's such a complex
15 topic.

16 Q: Now a question for Fortis again. Covering 17,000
17 square kilometres with these high-speed frequencies,
18 is that going to cover everything in the ground?
19 Everything in 17,000 square kilometres. Just say yeah
20 or no.

21 MR. WARREN: A: I don't think I'm qualified to answer
22 that.

23 DR. SHKOLNIKOV: A: I have performed four years of
24 measurements of radio frequency penetration through
25 the ground for purposes of my work on ground
26 penetrating radar. The attenuation through the ground

1 is very rapid, which makes this task very difficult.
2 So whatever the numbers that were cited in E^xponent
5 Report for exposure in the air would have to be
4 dramatically reduced for any buried objects or
5 animals.

6 MR. BENNETT: Q: That isn't what I was actually talking
7 about, but that's a very good question. How deep do
8 these frequencies penetrate into the ground?

9 DR. SHKOLNIKOV: A: I think when I present those
10 results to the -- at the conference, the question
11 isn't how deep, but the question is when do they drop
12 below a level at which you can detect?

13 MR. BENNETT: Q: Okay.

14 DR. SHKOLNIKOV: A: So with fairly -- it depends on the
15 soil type and the frequency range, but at 900
16 megahertz I would be surprised if the distance was
17 anything substantial over, you know, maybe, depending
18 on the soil type maybe a meter down or so. It really
19 depends on soil conditions, but that's probably the
20 level at which it becomes difficult to detect them,
21 and again the detection and exposure are two
22 completely different topics.

23 MR. BENNETT: Q: Did you know that the EPA -- did you
24 know that the EPA has done studies and they've really
25 got some alarming concerns with -- and I'm not going
26 to pronounce this properly, I know, but related to

1 frequencies affecting fungi and plant growth in their
2 national parks?

5 DR. SHKOLNIKOV: A: I have not come across such
4 documents.

5 DR. BAILEY: A: Neither have I.

6 MR. BENNETT: Q: I didn't think I would have to either
7 but we ended up doing that. But here's a question for
8 you. In that coverage area you know, has Fortis
9 considered the liabilities to agriculture? The trees?
10 Anything related to it? What this is going to do to
11 plant life? Industry associated with.

12 **Proceeding Time 3:16 p.m. T70**

13 MR. LOSKI: A: Go back to similar to the previous
14 question on buildings. You know, again, being -- with
15 the emissions from the AMI project being in compliance
16 with those guidelines, then from that perspective
17 there is not going to be a liability for Fortis.

18 MR. BENNETT: Q: So you're going to use the -- are you
19 -- is Fortis going to use the position of Health
20 Canada's Safety Code 6 related to agricultural crop
21 failures?

22 MR. LOSKI: A: Again, we look at -- we need to be in
23 compliance with the Safety Code 6 guidelines which
24 relates to radio frequency emissions. And as we've
25 stated, the AMI project is significantly -- the
26 emissions from the AMI project are significantly lower

1 than Safety Code 6.

2 MR. BENNETT: Q: That's not relevant to a plant in
5 biology, is it?

4 DR. BAILEY: A: Sir, I think the -- one can speculate
5 about all kinds of potential effects. But I think at
6 the end of the day, if it were to be shown that the
7 FortisBC AMI system was producing adverse effects and
8 that could be demonstrated in a rigorous fashion, then
9 they would have to address the outcome of such a
10 determination. But you know, that is the way that
11 issues about effects are decided, not by speculation,
12 but by testing of a hypothesis and determining whether
13 or not the results are consistent or inconsistent with
14 that hypothesis.

15 MR. BENNETT: Q: As somebody that's a professional in
16 risk assessment, wouldn't you suggest that they do the
17 risk assessment prior to that meter program?

18 DR. BAILEY: A: I think that there is not a weight of
19 the evidence that would suggest a need to do so.

20 MR. BENNETT: Q: Based on the heat effects.

21 DR. BAILEY: A: Based upon any reported effects.

22 MR. BENNETT: Q: Boy, oh, boy, oh, boy. Mr. Bailey.

23 Birds -- birds use -- birds migrate and fish spawn
24 using the earth's magnetic field. Bees use the
25 earth's magnetic field. Birds use the earth's
26 magnetic field for navigation. What would you think

1 is going to happen to them when they run into a high-
2 speed electromagnetic field?

5 DR. BAILEY: A: Well, the first answer is, that the
4 earth's geomagnetic field has a very different
5 frequency, and to the extent that organisms have
6 developed specialized receptors to make use of
7 information from the earth's geomagnetic field, and to
8 use that perhaps in homing behaviour, or in some
9 species of fish, they have very sensitive receptors
10 that are designed to pick up the low-frequency fields
11 of prey. So, for instance, a shark swimming over the
12 floor of the ocean can detect a flounder buried
13 underneath the sand that is producing an extremely
14 weak electric field.

15 So we have this exquisite sensitivity that
16 these animals have developed for -- over evolution, to
17 better adapt and survive. That, just in the same way
18 as the example I gave, with the human eye, we've
19 developed this specialized receptor for detecting
20 wavelengths in the visible light range.

21 **Proceeding Time 3:21 p.m. T71**

22 In the same way these organisms have
23 developed a detector to respond to signals in the
24 environment that are relevant to them and their
25 survival, and these are in the zero or static field
26 frequencies and for a few hertz above that. And

1 experiments have shown that the threshold for the
2 response of organizations to alternating fields as you
3 go up higher in frequency drops off very sharply. So
4 that the threshold, even at a frequency of 60 hertz,
5 is -- you have to use a very, very, very strong
6 magnetic field, for instance, to get a bee to respond
7 to a magnetic field at 60 hertz compared to what is
8 required to get that bee to attend to a signal at 0
9 hertz.

10 So if you go up even higher in frequency,
11 you are not going to see the type of interference that
12 you're suggesting.

13 MR. BENNETT: Q: So did you include in the E^xponent
14 Report biological information related to that
15 interaction with, you know, all kinds of life within
16 that coverage area? Just a yes or no is fine.

17 DR. BAILEY: A: No, I did not. The purpose of my
18 report was to focus on human health issues, but I have
19 an abiding interest in these adjacent areas involving
20 interactions of electromagnetic fields with a variety
21 of organisms in the environment including bees and
22 fish.

23 MR. BENNETT: Q: Isn't it, you know, there's a footnote
24 I think on page 5, I think it's on page 5 of your
25 report that says most of the epidemiology studies
26 related to frequencies are at 60 hertz.

1 DR. BAILEY: A: I don't believe that's exactly what it
2 says, sir. Let's turn to that so we can be exact. I
5 do not see that citation on page 5.

4 MR. BENNETT: Q: Maybe just shortly after that, maybe 7
5 or --

6 DR. BAILEY: A: I think it's -- oh, let's go to page 1.

7 MR. BENNETT: Q: Okay, there you go.

8 DR. BAILEY: A: There's a footnote number 1 which I'll
9 read it out. It says:

10 "While in engineering disciplines, RF...
11 or radio frequency fields,
12 "...and EMF..."
13 in this, what we're referring to is ELF, extremely low
14 frequency magnetic fields,
15 "...are used synonymously. The common usage
16 of EMF in epidemiologic studies primarily
17 refers to electric and magnetic fields
18 associated with the generation of
19 electricity from power lines and all
20 electric devices at 60 cycles per second or
21 60 hertz."

22 So epidemiology studies that are focused on
23 the power system are involving exposures at 60 hertz,
24 and epidemiology studies of radio frequency fields are
25 dealing with obviously sources of exposure from radio
26 frequency sources like AM and FM transmitters, mobile

1 phones and so on.

2 MR. BENNETT: Q: Okay. Doctor, can these
5 electromagnetic fields develop a charge on something?

4 DR. SHKOLNIKOV: A: Develop a charge. You'd have to --

5 MR. BENNETT: Q: Develop, a -- you know, trucks moving
6 down a high will pick up a charge that can be set off
7 statically. Will these develop a charge on anything
8 within the coverage area, and particularly volatile or
9 classed areas that could cause an explosion or a fire?
10 And again I'm not talking about the meters. I'm
11 talking about the infrastructure of radiating the
12 areas to communicate with meters?

13 **Proceeding Time 3:26 p.m. T72**

14 DR. SHKOLNIKOV: A: If you're -- I don't understand.
15 Are you asking about, is there a separate standard for
16 triggering off explosives with electromagnetic fields?
17 Or are you asking -- I may be confused about this.

18 MR. BENNETT: Q: When we wired, in Class 1, Division 1
19 areas, and we're so careful to -- we've grounded every
20 piece of metal at an airport to avoid a charge
21 collecting on something that could possibly be set off
22 by something such as a static touch, whatever the case
23 may be, that would cause this. So we've grounded
24 everything metal at that airport to give any potential
25 problems a path to ground, so it's not dangerous.

26 Aren't radiating volatile industries, or

1 labs, or areas in different material considerations,
2 is there the slightest chance that you could develop a
5 charge in a volatile area, and cause a fire? Cause an
4 explosion?

5 DR. SHKOLNIKOV: A: Well, the answer is, the concept --
6 when you're referring to RF, is called -- what it's
7 called? -- "emission electromagnetic ...". Can't
8 remember the term. Emission -- basically what happens
9 is, if you started using electric fields in the order
10 of 3 million volts per metre, on the surface, you can
11 have ionic emission, meaning that the body -- you
12 know, an object will serve as a filament, and you will
13 begin to get charges. So, for example, if you put
14 aluminum foil in a microwave oven, that sparking is --
15 I think it's called "thermionic emission". Those
16 limits, clearly that effect would be of concern, but
17 considering the electric fields involved, which is 3
18 million volts per metre, and the Safety Code 6 limit
19 of 61 volts per meter, there is a fairly large
20 distance.

21 So the answer is, yes, if you begin to
22 exceed the limits greatly by many orders of magnitude,
23 you can have an effect of charges. But the difference
24 between power systems and the other -- and other
25 systems is that there is -- you can have sort of
26 tribal electricities through like friction, or other

1 systems, you can form the charges as you begin to
2 repel the electrons.

5 In RF fields, unless you get to the 3
4 million volts per meter, such an effect doesn't exist.
5 Because you need to exceed -- you know, the electrons
6 want to stay in an object, and to pull them off takes
7 a lot of force, and that force would require a very,
8 very large electric field.

9 MR. BENNETT: Q: And I just want to make sure you guys
10 have covered that in your considerations, that you're
11 going to be interacting with everything in 17,000
12 square kilometers, and every type of material. We've
13 all walked across a carpet and gone "pssh" and zapped
14 somebody on the nose like this. So just again it's
15 just an issue for consideration that you've covered
16 that as far as a safety issue goes, or Fortis has?

17 DR. SHKOLNIKOV: A: The standard, and I mentioned this
18 effect occurs at much higher powers. And if E^xPonent
19 was asked to address the possibility -- there is, for
20 example, a standard for putting down radio frequency
21 material near explosive material. And the emitters
22 we're working with were much higher power, like, you
23 know, like really high-powered devices. Yes, that
24 would have been addressed. But considering that we're
25 talking about devices that are producing the same peak
26 field as a cell phone on the side of your house --

1 So there's a difference between possible
2 effect and probably effect, and for the effects you're
3 describing there's such low on the improbable, so they
4 have such high improbability as to, in lay person's
5 explanation, to say impossible. So you can't rule it
6 out, but there are a lot of other effects which are
7 much more likely to occur. And I think this is why
8 you have to be careful in using terminology.

9 You know, there are a lot of quantum
10 electrodynamic effects in the universe, and when -- as
11 I said, you don't consider them, you know, you don't
12 consider them when making an electrical system. You
13 don't include air boom effect because there's a
14 possibility that your house could be frozen to
15 cryogenic temperatures, although that is in a venue of
16 what is -- I can't rule out as being impossible. It
17 is just highly improbable.

18 So to go into the discussion of all the
19 possible physics effects and not taken to look in
20 their probability and then make a real judgment
21 although it doesn't require a lot of judgment to cut
22 out those effects is improper, because then nothing
23 would ever be done because before I take a step down
24 this road I have to calculate a probability of my body
25 because it's quantum device and has weight properties,
26 of me diffracting instead of going in a straight line.

1 But it is such high improbabilities that I don't do
2 it.

5 And for the same reason, when you're trying
4 to build a structure or design a structure, you have
5 to take into account which effects are so highly
6 improbable as not worth attention, and which effects
7 have non-negligible probability and should be
8 considered. And when Safety Code 6 was written, you
9 know, it does take into account those considerations,
10 and that's why -- and in fact does add another safety
11 factor 50 over what it even considered itself to be a
12 low probability effect.

13 MR. BENNETT: Q: Yeah, and the only thing I would say,
14 that is just -- because this is new and we haven't
15 radiated 17,000 square kilometers before, there just
16 isn't that standard. Would you agree?

17 DR. SHKOLNIKOV: A: We have. The GPS system covers the
18 earth basically over the entire surface and has to
19 comply with a very tight standard on the minimum
20 signal arrived at a specific area. As I said, your
21 cell phone, by your argument, is irradiating, just
22 your cell phone right now is irradiating a 10 mile
23 radius around you to everybody exposing you. But it's
24 a wrong terminology. The question does a signal go
25 there versus is that signal detectable, and then it's
26 a signal causing biological effects are three

1 completely separate questions, because I can also say
2 that your cell phone is irradiating the whole, you
5 know, as the speed of light propagates, is irradiating
4 this whole universe, because there's nothing
5 physically stopping it from propagating throughout the
6 whole universe. And so this terminology of
7 irradiating is not informative for purposes of
8 engineering analysis.

9 MR. BENNETT: Q: Electromagnetic radiation, isn't it
10 radiation?

11 DR. SHKOLNIKOV: A: So is the voice I'm speaking with.
12 I'm using acoustic energy which is also referred to as
13 acoustic radiation when I'm talking to you. Your
14 heater at home is producing heat radiation. And this
15 is where the word "radiation" becomes important.
16 Radiation means propagation of energies through space.
17 You know, you don't say that I'm using acoustic
18 radiation to speak to you. You say I use verbal
19 communication with you. With smart meters you say
20 they communicate using RF signals. And with the
21 radiator you say they just dissipate heat into the
22 environment. But in all the cases that we're
23 referring to it's radiation. It's just a term that
24 literally means propagation of energy away from the
25 source.

26 MR. BENNETT: Q: You're absolutely right. Now, and

1 just to move on quickly so we can get into some of
2 these other areas, but radiating a fetus,
5 electromagnetic radiation, electromagnetically
4 inducing a pregnant woman with these frequencies,
5 24/7, isn't the same thing as acoustics. Is it?
6 Sorry if I put the question part there.

7 I'm going to -- I'll move on on the
8 question here, just so I can hurry up, sir.

9 Is Fortis installing this program to save
10 energy, obviously? Are they doing this to save
11 energy? I'm sorry.

12 **Proceeding Time 3:35 p.m. T74**

13 MR. WARREN: A: There are a number of benefits outlined
14 in the application. We actually are not claiming
15 directly in the application any energy saving
16 benefits, although we do expect some to be achieved,
17 and some energy saving benefits will be claimed by our
18 PowerSense program through the IHDs.

19 MR. LOSKI: A: And if I can add, part of the reason for
20 the need here, as well as the timing of the need for
21 the project, is -- and Mr. Warren can elaborate on
22 this if necessary, but due to changes in Measurement
23 Canada's meter certification, we do need to replace
24 our existing electromechanical meter fleet. And so
25 that again is something we need to do, and certainly
26 the project is consistent with energy policy and in

1 the province, and as you said, there are -- or as
2 we've said, there are significant benefits associated
5 with this project.

4 MR. BENNETT: Q: Okay.

5 MR. WARREN: A: I did ignore some -- actually, in my
6 statement, some small energy savings associated with
7 our theft reduction program, although the benefits of
8 that program, which are part of this application, are
9 primarily in increased billable load as opposed to
10 energy savings.

11 MR. BENNETT: Q: But the province energy plan talks
12 about greenhouse gas emissions, global warming,
13 climate change. Has this been part of the program as
14 well? This being consistent with that energy plan in
15 helping do that? Can I get you to --

16 MR. LOSKI: A: That's correct.

17 MR. BENNETT: Q: Can I get you to Exhibit -- the same
18 Exhibit, C19-6. And go to page 6, please. You can
19 see I made mistakes, I had to write it in there.

20 MR. WARREN: A: Is this in your handout?

21 MR. BENNETT: Q: Yeah, Exhibit C-19. That exhibit
22 number should be at the top.

23 MR. WARREN: A: Oh. C19-8.

24 MR. BENNETT: Q: Or do you guys have -- yeah, you've
25 got it.

26 MR. WARREN: A: It's this one, this figure over here?

1 MR. BENNETT: Q: Yes. Okay, if you don't have it -- do
2 you have a copy of that with you?

5 MR. WARREN: A: Is it in this package here?

4 DR. SHKOLNIKOV: A: It is the same exhibit as was
5 referred to before, I believe, which is C19-6. Where
6 this is a thermodynamic --.

7 THE CHAIRPERSON: I have it on my computer here.

8 MR. WARREN: A: Thank you.

9 THE CHAIRPERSON: What page are you on?

10 MR. BENNETT: Page 6.

11 THE CHAIRPERSON: Page 6.

12 MR. BENNETT: Q: Are buildings designed and insulated
13 to accommodate a specific regional climatic load
14 that's outlined in building code?

15 MR. WARREN: A: That's a bit beyond my area of
16 expertise, but that's my understanding, yes.

17 MR. BENNETT: Q: I don't know if I can state it as a
18 question. Is it B.C. Building Code, do you know, that
19 -- do you know that B.C. Building Code has a section
20 specific to regional climatic data?

21 THE CHAIRPERSON: Mr. Bennett, I've just had a quick look
22 at that -- at your material here, and I'm not sure
23 that it deals with health issues, which is the subject
24 that we're to be dealing with here.

25 MR. BENNETT: Well, I thought it was --

26 THE CHAIRPERSON: Can you clarify --

1 MR. BENNETT: I thought it was health and environment,
2 sir.

5 THE CHAIRPERSON: Environment? Okay, thank you.

4 MR. BENNETT: And actually -- this issue is actually --
5 and again, related to this program.

6 **Proceeding Time 3:40 p.m. T75**

7 MR. BENNETT: Q: But what you're seeing there with the
8 dark area in this wall here, this is missing
9 insulation in the wall. Can you appreciate that the
10 dark area, assuming that the imaging is accurate, that
11 that's missing insulation in the wall?

12 DR. BAILEY: A: I'll take your word for it.

13 DR. SHKOLNIKOV: A: I would like to address it. It's
14 improper to look at diagrams like this to determine if
15 there's a missing insulation. In imagines like this
16 there are two effects. One is the temperature.
17 Another one is emissivity of the material. And when
18 you do measurements like this, it's typically very
19 difficult to identify what is inside without being
20 more knowledgeable about it. So images like this are
21 usually accompanied by other measurements so they're
22 informative for finding areas for concern, but they're
23 not necessarily determinative about any of the
24 underlying causes.

25 MR. BENNETT: Q: And you'd be right with that, but
26 wouldn't a building missing insulation, wouldn't their

1 heating and energy systems run longer and run harder,
2 more emissions, more fossil fuel use to accommodate
3 those losses? And just a yes or no is --
4 MR. WARREN: A: The more -- or the better insulated
5 ability, the less heat loss it'll have or less cooling
6 loss it'll have, and vice versa.
7 MR. BENNETT: Q: Is a smart meter program going to
8 address energy issues like this?
9 MR. WARREN: A: It will identify, as we talked about
10 other days, it'll identify on a more detailed basis
11 how much energy you're using. It won't tell you
12 exactly how that energy is being used or why that
13 energy is being used.
14 MR. BENNETT: Q: So they'll bill you for it but they're
15 not going to address the problem, is that correct?
16 MR. LOSKI: A: Well, sorry, I'm going to jump in here,
17 but the issue of things such as insulation in a
18 building is not part of the AMI project. And I could
19 explain that, but I think it's self-evident there.
20 This is completely out of scope with respect to the
21 application.
22 MR. BENNETT: Q: Is this panel related to health and
23 environment?
24 MR. LOSKI: A: Yes, it is, but the AMI project is not
25 about -- does not include insulation in the homes.
26 MR. BENNETT: Q: But it does state that -- doesn't it

1 state that you're going to address the province's
2 Energy Plan by reducing greenhouse gas emissions and
5 energy efficiency? That's one of the purposes of the
4 program?

5 MR. LOSKI: A: Yes. There will be, as we said in the
6 application, we expect -- and Mr. Warren gave some
7 specific numbers earlier in his testimony, that there
8 will be a reduction of greenhouse gas emissions
9 because of reduction in vehicle usage due to reduction
10 of manual meter reading. And as far as -- and we also
11 said that with the increased information that's going
12 to be available to our customers as a result of the
13 project, they will be in a better position to make
14 more informed energy choices, and therefore should, we
15 are hoping, will result in energy efficiencies
16 realized by our customers, resulting in lower usage.

17 MR. BENNETT: Q: How much AC does Fortis -- how much of
18 your demand is air conditioning?

19 MR. WARREN: A: I'm not sure of that exact number. In
20 fact it would not be possible to determine.

21 THE CHAIRPERSON: I'm going to interrupt here just for a
22 moment because I just don't know exactly where you're
23 going here. But the intention of this cross-
24 examination is health, and as you quite correctly
25 mentioned, the environment, but it has to do with the
26 effect of the -- or possible effect of the proposed

1 infrastructure on health and the proposed -- or the
2 potential effect, if there is any, on the environment.
5 And so really we should be questioning the panel from
4 that point of view.

5 And as I say, I don't know exactly where
6 you're going with this, and I -- so I'll allow you
7 just a little more leeway. But I hope you'll be
8 moving to the potential impact or possible impact of
9 the proposed metering program on the environment.

10 **Proceeding Time 3:44 p.m. T76**

11 MR. BENNETT: Q: Yeah. And again, because, you know,
12 this -- the metering program is specific to energy,
13 energy savings, the B.C. government energy plan. And
14 buildings using more -- wouldn't buildings using more
15 energy to accommodate problems with the building in
16 the municipality's jurisdiction -- your smart meter's
17 not going to catch that. But you're going to bill
18 people for it. Is that correct?

19 MR. WARREN: A: We didn't claim, as I said earlier,
20 aside from some small energy savings related to theft
21 reduction, we haven't talked about energy savings or
22 claimed energy savings as a benefit in this
23 application.

24 MR. LOSKI: A: We have other programs that allow
25 customers to -- you know, through our PowerSense
26 programs, to address specific energy efficiency

1 requirements such as insulating their homes. But
2 again, that is irrespective of what we do here with
5 the AMI project.

4 MR. BENNETT: Q: I would -- can I respectfully
5 disagree? Because if you're not addressing the energy
6 issues and your meters aren't addressing the energy
7 issues, what's the purpose of the program then?

8 MR. MACINTOSH: The problem here in the questioning, Mr.
9 Chair, which I will now start to take objection to
10 just because of the consumption of time, is that the
11 environmental issues, as you pointed out, are those
12 stemming from introducing AMI. The line of
13 questioning is along the lines that these meters won't
14 measure the wasted electricity from a poorly-insulated
15 house any differently from how a digital -- an old
16 meter will.

17 It's neither here nor there for this
18 application, in my submission, and it's not dealing
19 with the health effects or the environmental effects
20 of these meters.

21 THE CHAIRPERSON: I agree with that. And I raised that
22 matter. I don't know whether you have any comment to
23 make on the objection, Mr. Bennett.

24 MR. BENNETT: I would ask you that if environmental --
25 does environmental mean more toxic emissions? Does
26 that affect the environment? Does super-heating the

1 atmosphere and changing climate, is that
2 environmental? And this -- these are the things that
5 this program is supposed to address, and it is spoken
4 about in their reference to the B.C. Energy Plan.

5 But --

6 THE CHAIRPERSON: In my view, you've failed to make the
7 connection here between your concern about adequately
8 insulated buildings and the application that's before
9 us, which is for a particular --

10 MR. BENNETT: So we're talking about the environment --
11 are we talking about the environment surrounding the
12 meter, or are we talking our environment?

13 MR. MACINTOSH: We're talking about environmental impacts
14 of this project going ahead.

15 **Proceeding Time 3:48 p.m. T77**

16

17 THE CHAIRPERSON: Yes. You touched on that in some of
18 your previous questions, I believe, when you did talk
19 about flora and fauna and penetration of the earth and
20 that sort of thing. At least that was my take on it.

21 MR. BENNETT: And again I'm going to close with something
22 quickly here, and I can just address this when we do
23 something in writing or our final argument or
24 something, just to mention it then, that would be --

25 THE CHAIRPERSON: I think that's probably the better way
26 to address that, because as I say, as you have begun

1 your questions, I think that particular matter is out
2 of scope for this oral hearing.

5 MR. BENNETT: Okay, thank you. I gave this to you
4 earlier on.

5 Q: And I would refer you to page 4. Are you
6 familiar with this petition, environmental petition by
7 Dr. Meg De Havis?

8 MR. WARREN: A: I'm not.

9 DR. BAILEY: A: I'm not.

10 MR. LOSKI: A: We became aware of it when you handed
11 this to us at lunch.

12 MR. BENNETT: Q: Well, the reason I ask this too, is
13 this was brought up in a question to me by Fortis
14 lawyers in asking me questions to make reference, was
15 I aware of Dr. Meg De Havis's petition.

16 Are you aware, you know, that the Auditor
17 General's office then -- or you wouldn't be aware of
18 it. I have to ask this as a question. Are you aware
19 that the Auditor General's office sent this to us to
20 take a look at this to see if there was anything
21 different compared to other discussions on radio
22 frequency exposure, and to point out differences? Are
23 you aware of that? You're not.

24 MR. LOSKI: A: No.

25 MR. BENNETT: Q: Okay. What Dr. Havis -- are you aware
26 that Dr. Havis pointed out that exposure limits are --

1 DR. BAILEY: A: I did not know that.

2 MR. BENNETT: Q: Okay. And did you know that Safety
3 Code 6 again did not incorporate the frequency or the
4 electrical properties of human beings?

5 DR. BAILEY: A: We've been through that earlier. And I
6 disagree, sir.

7 MR. BENNETT: Q: Okay. Do you understand that it's
8 really important to the panel in looking at this that
9 the differences between the top to the bottom are
10 increased power density, which is more electrical load
11 the subjects were under?

12 DR. BAILEY: A: I see that the scale on the Y axis is
13 in power density, but I don't know that it has
14 anything to do with this so-called electrical load.

15 MR. BENNETT: Q: Electrical load is power. Watts.
16 Are you aware that Dr. De Havis's petition
17 related to these frequencies was, you know, more or
18 less put aside because they were missed -- Safety Code
19 6 was missing critical data? Critical science?

20 DR. BAILEY: A: I don't know what the reaction was
21 given to this petition.

22 MR. BENNETT: Q: Just to -- in closing for the record
23 here, Dr. Bailey, hearing causality from an electrical
24 professional, hearing about -- doesn't that -- hearing
25 that causality, doesn't that change your mind on
26 causality, biological plausibility, reproducibility,

1 and a code that's going to change? Wouldn't you --
2 would you change your report or your reference to
5 these guys moving forward with this program?

4 **Proceeding Time 3:54 p.m. T79**

5 DR. BAILEY: A: Not based upon what I've heard today.

6 MR. BENNETT: Q: And good doctor on the end, hearing
7 that they left out critical electrical information
8 related to frequency exposure interaction, does that
9 change your position on the E^xPonent Report?

10 DR. SHKOLNIKOV: A: I am not aware of any such evidence
11 being introduced in the hearing today.

12 MR. BENNETT: Q: You didn't hear that they left out
13 electrical properties and frequencies of human
14 organisms in that interaction with these frequencies?

15 MR. MACINTOSH: That's been asserted by Mr. Bennett
16 repeatedly. It's been rebutted by the panel
17 repeatedly. Thank you.

18 MR. BENNETT: Q: No, just listen on record. Thank you
19 very much, guys.

20 THE CHAIRPERSON: Thank you. Thank you, Mr. Bennett.

21 MR. FULTON: Mr. Chairman, that concludes the cross-
22 examinations for today. There is one undertaking that
23 Fortis has to file, and then if I might just speak to
24 the start time for Monday.

25 THE CHAIRPERSON: Yes, thank you.

26 MR. FULTON: I say that with some temerity, Mr. Chairman.

1 THE CHAIRPERSON: I'm sure you do.

2 MR. FULTON: I haven't had a lot of success lately on
5 start times.

4 MS. HERBST: Thank you, Mr. Fulton. Thank you, Mr.
5 Chair, Commissioners. I have one undertaking to file,
6 and it is Undertaking No. 7, or the response thereto.
7 And this relates to a question that was posed by Mr.
8 Aaron to Dr. Bailey, and it boiled down to a request
9 to identify a study cited in Safety Code 6 and ICNIRP
10 that considered modulation and power density windows.
11 And so, Safety Code 6 itself has a list of 32
12 references on pages 26 -- 24 to 26. And that's using
13 the page numbering in the bottom corner of each page.

14 And Table 1 sets out a list of the
15 references with two columns, one reflecting
16 modulation, one reflecting power density windows. So
17 it's a list of the studies by reference number in the
18 list of 32 in Safety Code 6 that considered those
19 topics.

20 The second table on page 2 lists the
21 studies cited in ICNIRP in which modulation or power
22 density topics -- window topics were identified. And
23 the ICNIRP report itself is reference number 30 within
24 Safety Code 6 and so that deals with that undertaking.

25 I believe if my numbering is correct this
26 would be Exhibit B-45.

1 THE HEARING OFFICER: B-45.

2 (FORTISBC UNDERTAKING NO. 7, VOLUME 4, PAGE 668, LINE
3 12 TO PAGE 678, LINE 19, MARKED EXHIBIT B-45)

4 MS. HERBST: And thank you.

5 THE CHAIRPERSON: Thank you for that. Now, Mr. Fulton,
6 what are you proposing for Monday morning? Please
7 consider this very carefully.

8 **Proceeding Time 3:57 p.m. T80**

9 MR. FULTON: Yes, I will, because I understand you have a
10 three strike policy, Mr. Chair. So I'm going to
11 suggest 9:00 on Monday morning. We have Mr. Flynn as
12 the next cross-examiner, and I do have a request from
13 a member of the public to ask some questions of this
14 panel as well. We can deal with that on Monday, but
15 she has told me that she thinks she'll be less than
16 half an hour. So she will need leave. I'll speak to
17 that on Monday.

18 THE CHAIRPERSON: Yes.

19 MR. FULTON: But after -- Mr. Flynn has estimated about
20 three hours, so I need probably at this point I would
21 think about half an hour to 45 minutes. That may
22 change over the weekend, but that's where I'm at at
23 this point. That will then take us to questions from
24 the Panel, and following that, re-examination by
25 Fortis.

26 So I have every expectation that we will

1 finish this panel on Monday, and therefore I'm
2 recommending a 9:00 start.

5 THE CHAIRPERSON: Thank you. Is that convenient with --

4 MR. MACINTOSH: The later the better, Mr. Chair, is the
5 way that works. Thank you.

6 THE CHAIRPERSON: Yes, I think that's a good suggestion.
7 We have a full day, I believe, on Monday, and I think
8 it's important that we work towards finishing off with
9 this panel on Monday. And so even if we finish a
10 little early, I think starting at 9:00 allows us to
11 accomplish what we have to accomplish. So let's agree
12 then to start at 9:00 on Monday morning. I think your
13 recommendation is a very good one, Mr. Fulton.

14 That concludes our hearing for today, or
15 the phase of our hearing today, and I wish everybody a
16 good weekend and safe travels to those people who have
17 travelled from out of town to be with us today. Thank
18 you.

19 **(PROCEEDINGS ADJOURNED AT 3:59 P.M.)**

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