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MANITOBA PUBLIC UTILITIES BOARD

Re: MANITOBA HYDRO'S APPLICATION
FOR APPROVAL OF NEW ELECTRICITY RATES
FOR 2010/11 AND 2011/12

Before Board Panel:

Graham Lane - Board Chairman
Robert Mayer, Q.C. - Board Member

HELD AT:

Public Utilities Board
400, 330 Portage Avenue
Winnipeg, Manitoba
May 5, 2011
Pages 6049 to 6229

1 APPEARANCES

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TABLE OF CONTENTS

Exhibits

Page No.
6052

INDEPENDENT EXPERTS PANEL:

DR. ATIF KUBURSI, Resumed

DR. LONNIE MAGEE, Resumed

Continued Examination by Mr. Gavin Wood

6053

Cross-Examination by Ms. Anita Southall

6129

Certificate of Transcript

6229

1	EXHIBITS		
2	No.	Description	Page No.
3	PUB-20	Reference book of documents	6160
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
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1 --- Upon commencing at 9:36 a.m.

2

3 THE CHAIRPERSON: Good morning, everyone.

4 I won't make the same mistake I made yesterday. Ms.

5 Ramage, do you have any more undertakings to file?

6 MS. PATTI RAMAGE: I do not.

7 THE CHAIRPERSON: Not at this point,

8 anyway. Ms. Southall, do you have any opening comments?

9 MS. ANITA SOUTHALL: No, I -- I think
10 we're proceeding with completion of the direct evidence
11 of Drs. Kubursi and Magee.

12 THE CHAIRPERSON: Very good. Mr.

13 Wood...?

14

15 INDEPENDENT EXPERTS PANEL:

16

17 DR. ATIF KUBURSI, Resumed

18 DR. LONNIE MAGEE, Resumed

19

20 CONTINUED EXAMINATION BY MR. GAVIN WOOD:

21 MR. GAVIN WOOD: Sir, just to have
22 everybody start this morning at the same place, I'm --
23 we're now at page 195 of the -- of the main report and --
24 and page 47 of the direct examination.

25 THE CHAIRPERSON: Would you just give a

1 second, sir, so we're there. Thank you for your
2 patience.

3

4 CONTINUED BY MR. GAVIN WOOD:

5 MR. GAVIN WOOD: Dr. Kubursi, you and I
6 had spoken overnight concerning the next several pages in
7 the direct. What -- what the direct examination goes on
8 to do, and it does take several pages to do it, but it
9 attempts somewhat to summarize the ICF-KM -- KPMG, of
10 course, positions and contrasts those with the NYC
11 positions before at Section 11(f) of the direct, going on
12 to deal with five (5) findings that Dr. Magee and you
13 have -- have ultimately arrived at.

14 What you had asked me is you would just
15 like a brief opportunity to summarize those two (2) sets
16 of positions that Dr. Magee and yourself found before you
17 go on to summarize the findings. So would you go ahead
18 and do that for me, please.

19 DR. ATIF KUBURSI: I'm going to summarize
20 the major issues and questions that were raised by all
21 the parties concerned: ICF, KMPG, NYC, and several others
22 too from the report. But the major questions are
23 summarized where we look at page 50 under the serious
24 questions. And there I have a string of them, and I'm
25 going to go through them because they will define the

1 context and the framework within which some of these
2 questions have been answered.

3 DR. LONNIE MAGEE: In -- in your page
4 numbers it might be page 51.

5 DR. ATIF KUBURSI: Fifty-one (51), yeah,
6 I think. I -- I have fifty (50), but may --

7 MR. GAVIN WOOD: It's just another -- ju
8 --

9 DR. ATIF KUBURSI: Another --

10 MR. GAVIN WOOD: -- just a photocopy of
11 it. It's actually at the bottom of page 51. Thank you.

12 DR. ATIF KUBURSI: The first question is:
13 Are export revenues subsidizing Manitoba's rates? Are
14 the risks embedded in these contracts, long-term
15 contracts, sufficiently low and mitigated by Manitoba
16 Hydro? Can the terms of these contracts be improved and
17 made more in favour of Manitoba Hydro? Is the new
18 capital expansion program necessarily warranted? Is the
19 timing of the capital expansion staggered enough? Are
20 the negotiated long-term prices embedded in these
21 contracts and their escalations high enough that would
22 exceed opportunity prices? Is MH capturing all the rents
23 in the environmental attributes? Is the transmission
24 capacity squandered on long-term contracts and not used
25 enough for lucrative opportunity sales?

1 As you can see, the NYC, on the next page
2 brings about seventeen (17) claims. And these are listed
3 here. When I'm going to summarize our findings, I will
4 refer to them. Maybe it would not be necessary that I go
5 through them.

6 MR. GAVIN WOOD: And -- and may I just
7 say for the record, that's in itself a summary of thirty-
8 seven concerns that are listed beginning at page 204 of -
9 - of the main report and on the next several pages.

10 DR. ATIF KUBURSI: Actually, the largest
11 share of questions NYC had are concentrated in the area
12 of long-term contracts. And she felt that this is the
13 area where probably where the risks are there. I mean,
14 she had, as I argued yesterday, that she has discounted
15 the cause of the drought and felt that the cause of the
16 drought is exaggerated by MH to cover, in her view, the
17 actual exposure to risk in the long-term contracts.

18 Well, our findings are from 11 all the way
19 to 15. And we came to some appreciation of the logic and
20 the reasons that both KPMG and ICF, ICF were really
21 first, who argued very strongly in favour of diversifying
22 the portfolio of offering, in the sense that exports,
23 especially when divided between opportunity and firm, are
24 a diversification.

25 And they would expand the portfolio and

1 could be considered, by themselves, as a risk-mitigation
2 strategy. That -- that it is important when your fixed
3 goals are extremely high that you get fixed commitments
4 that match these fixed goals of the type we talked about
5 yesterday, that it guarantees a secure transmission
6 investment by counterparties that in the absence of these
7 may have to be undertaken, if at all possible, by
8 Manitoba Hydro.

9 That it is also important to engage in
10 these expansions and these exports to preempt expanding
11 capacity by counterparty and competitors. That this
12 would also increase the stability of revenues and this
13 would increase and enable Manitoba Hydro to access
14 capital markets on favourable terms.

15 It also raises US dollars that would act
16 as a natural hedge against obligations in imports or
17 transmission or capital acquisition in US dollars. That
18 this would give Manitoba Hydro greater access to imports,
19 firm imports, and this would also give the chance for
20 Manitoba Hydro to classify its exports in the category of
21 firm and more reliable and, therefore, higher -- higher
22 priority of delivery.

23 And the -- both consultants, KPMG and ICF
24 felt strongly that whatever costs are embedded or risk
25 exposure that would be experienced is far below the

1 expected benefits that could come from this.

2 We concurred with most of these things,
3 although we put some conditions, and these are going to
4 come down, and they -- I will go over them as we go
5 through the different findings. I mean, it's very much
6 contingent on the prices that one can get and the
7 curtailment provisions that may be negotiated and the
8 upset prices of these imports and the likelihood to
9 escape congestion prices.

10 MR. GAVIN WOOD: And -- and may --

11 DR. ATIF KUBURSI: And finding 12 --
12 yeah.

13 MR. GAVIN WOOD: And -- and may I just --
14 yeah, and thank you for going on to that. Just again for
15 the record and for the Board, that's found at pages 209-
16 210 that you've just summarized, finding 11. And then
17 you're going to finding 12, sir, please.

18 DR. ATIF KUBURSI: We found that the
19 contract prices, the historic contract prices, with the
20 exception maybe of a year or two (2), 2007, maybe a
21 little bit at the edge of 2006, that the contract prices
22 were sufficiently higher than MISO opportunity prices.
23 And that we have come to the agree -- you know, to a
24 general understanding that these constructed prices are
25 sufficiently well structured that they exceed the -- our

1 estimate of long-run marginal cost, and that the
2 combination of energy and capacity prices sufficient to
3 pay for some of the fixed costs and exceeded with some
4 rents.

5 That here the issue is that do these
6 export revenues can be relied upon to subsidize domestic
7 rates. There was a claim that came about that exports
8 represent 15 percent of the total cost of service and
9 they contribute 32 percent of revenues. We were not in a
10 position to ascertain and verify this.

11 It -- it is a very difficult issue to
12 allocate what we call joint costs. And it is quite
13 necessary here to be able to verify that the costs
14 allocated to exports are truly allocated and accurately
15 allocated before a claim can be made that the revenues
16 that are coming from exports are subsidizing domestic
17 rates. We were agnostic on this issue, preferring that
18 we get a little bit more information on the way these
19 joints costs are allocated.

20 On finding 13 --

21 MR. GAVIN WOOD: May I just have a
22 moment, please.

23

24

(BRIEF PAUSE)

25

1 MR. GAVIN WOOD: Thank you. And then
2 going on to finding 13, which begins at KM page 213.

3 DR. ATIF KUBURSI: A major issue is that
4 the expanded capacity that would come from the decade of
5 investment, whether it's in Keeyask or Conawapa, once
6 they are completed will they be sold at prices higher
7 than the expected costs of the assets and the generation
8 costs. And this is a very crucial question.

9 I -- I know that, Mr. Chairman, you were
10 yesterday very much concerned about these things. And
11 the issue would be these fixed costs would -- would be
12 very much dependent on the way we amortize over the
13 period. Are we using straight-line, double-declining,
14 double-digits? I mean, these are quite sensitive to the
15 period.

16 I mean, the way I was arguing yesterday is
17 that I would like the period to match the maturity
18 choice, you know, over which you want to amortize this,
19 not the actual physical amortization and the proportion
20 that you would like to write into the prices of these
21 costs. I mean, if we take it over a hundred years, then
22 surely we know that the amortization costs are going to
23 be extremely low per year. And then the average variable
24 course would be the dominant one.

25 If, on the other hand, you choose a short

1 period and double-declining and this, then you're
2 stacking all the costs of the future investment in the
3 early period and the average fixed cost would be
4 extremely high, and it would be declining very quickly,
5 but it's still very high per year. And one would like to
6 see some scenarios and some probing of how the expected
7 price in the future would match or would compare to the
8 average variable, average fixed costs.

9 Now we are talking about expected declines
10 and spot prices. I mean, we know that the natural gas
11 price is extremely low; the price of electricity
12 extremely low. And there is an expectation, and this is
13 something that one has to have a good fix on it, and no
14 one, particularly us, are in a position to really say the
15 price of natural gas is going to remain for fifty (50)
16 years or twenty (20) years at this low level.

17 But standing at this moment of time and
18 looking myopically, you know, like looking only at a
19 medium term, the expectations are all stacked towards
20 lower natural gas prices and lower electricity prices
21 given the set of knowledge and information we have now
22 about the state of the economy, its likelihood of
23 recovery, and the competing prices.

24 And the issue then remains in a very
25 significant way: Is there any flexibility? Does there

1 exist a flexible way of arranging the investments,
2 staggering it over time so that you can postpone making
3 this major irreversible, large, lumpy expenditures when
4 you gain greater and more firm knowledge about the future
5 likelihood of prices and economic activity?

6 And here we were a little bit concerned
7 that we want to be absolutely clear that these decisions,
8 and we go, as you can see, towards the end into an
9 elaborate decision framework where we would deal with
10 this. But we felt that neither of the reports, whether
11 it was us or KPMG or ICF, including the NYC, had much in
12 the way of helping the Board or MH in dealing with this
13 very complicated but very warranted, necessary
14 evaluation.

15 So our finding 13 is a little bit agnostic
16 here. But we go later on, as we -- we will proceed, to
17 outline what we consider to be a reasonable framework,
18 not the only one, not probably the best, but at least we
19 were willing to stick our necks and say, We will be in a
20 position to look at it in this way, and then we will
21 tender it and see the reactions to it. Finding 14.

22 MR. GAVIN WOOD: And just in terms of
23 that, part of that last answer, is "lumpy" a technical
24 economic term that you use there, or...?

25 DR. ATIF KUBURSI: No, it's French, no.

1 THE CHAIRPERSON: We have his point.

2 MR. GAVIN WOOD: And finding 14, sir,
3 begins at page --

4 DR. ATIF KUBURSI: Yeah.

5 MR. GAVIN WOOD: -- 214 of the report?

6 DR. ATIF KUBURSI: Ma -- maybe 13 I would
7 like to say something. It's a bit controversial. I know
8 Manitoba Hydro is not very happy about this. It's a
9 reasonable position for people to have different views.
10 We argued against the inclusion of wind in dependable
11 energy. And, in some sense, we also were -- felt that
12 including out-of-the-money thermal generation, a stretch,
13 that these are extremely costly, that somehow engineers
14 tend to think of supply to be a physical thing.

15 Economists, we never accept it as a
16 physical thing. We think that supply is sensitive to
17 prices, and an amount that you're willing to put on the
18 market is not independent of what it would cost you and
19 what are the likelihood of selling it at the higher
20 price.

21 So it is basically a difference of opinion
22 between engineers and economists. Engineers like to
23 really think of a supply as a physical quantity at a
24 given amount. Economists think it's a flexible amount
25 depending on the price. And here we're really saying

1 that in terms of wind, it's an issue of dispa -- being
2 dispatchable or not. That FERC in the US does not
3 consider it to be a reliable source should raise a
4 question whether it should be included in dependable
5 energy.

6 And the issue of out of the money, we
7 think that a concept, an economic concept of supply,
8 would require that we be a little bit more sensitive to
9 what would it cost to put this amount on the market.

10 MR. GAVIN WOOD: And number 14, please.

11 MR. ROBERT MAYER: I can see that. Dr.
12 Kubursi, I understand your argument with respect to wind.
13 Wind either blows or it doesn't blow, it's dispatchable,
14 it's not dispatchable, and therefore how can it be
15 dependable?

16 I don't understand your argument about our
17 thermal plants which, although expensive and expensive to
18 run, are in fact dispatchable, and as I understand the
19 single-cycled gas turbines, dispatchable relatively
20 quickly. In the case of relying -- Hydro's finding
21 itself in a position to rely on it, I understand
22 dependability means you get power, not necessarily that
23 it's inexpensive power, but in dependability I understand
24 that you have to get power. So I don't understand your
25 argument with respect to the thermal plants.

1 DR. ATIF KUBURSI: As I said, there is a
2 reasonable case for looking at more than one (1) side,
3 but I'd like to travel between here and my hotel using a
4 helicopter, because it may be extremely congested, and I
5 can get dependably over there, but it's too expensive.
6 It's beyond, you know, my budget constraint and looking
7 at alternatives.

8 What we are --

9 MR. ROBERT MAYER: But President Obama
10 does it because he can --

11 DR. ATIF KUBURSI: Yeah.

12 MR. ROBERT MAYER: -- and he needs to.

13 DR. ATIF KUBURSI: Yeah, yeah.

14 MR. ROBERT MAYER: And when it is
15 necessary, he can do it.

16 DR. ATIF KUBURSI: Yeah. I mean, this is
17 the question of abilities there. I mean, yeah. I mean,
18 if you say physically I need this power, I need to do it,
19 and that the alternative is going to be a -- a blackout,
20 I say, No, do it. But if I can always be conscious that
21 I would get something cheaper, an alternative, I would
22 like to really be in that position.

23 My worry is that, if you begin to argue
24 purely on physical quantities, that other considerations
25 of getting it in a more efficient and cheaper way may be

1 subsumed. That's -- that's the issue.

2 THE CHAIRPERSON: You indicated before
3 yesterday, if I recall, your focus was on keeping
4 production costs as low as possible.

5 DR. ATIF KUBURSI: And -- and that's
6 precisely my motiva -- you see, we're coming at it as
7 economists. We're a very strange breed, but, I mean, in
8 many respects, we have a fixation on efficiency and on
9 getting things in the lowest cost, not just purely for
10 greed, but it is an issue here of saving for society
11 scarce resources. If resources were in abundance, there
12 is no economic problem. If scarcity is the rule of the
13 way we operate, then we have to be absolutely convinced
14 that all opportunities, more efficient opportunities,
15 should be considered before we use anything.

16

17 CONTINUED BY MR. GAVIN WOOD:

18 MR. GAVIN WOOD: And -- and then, going
19 on to 14, please.

20 DR. ATIF KUBURSI: We had a chance, but
21 under confidentiality conditions, to examine term sheets,
22 and Manitoba Hydro had put before us the actual contract
23 of one (1) of their counterparties. And we were
24 convinced, if this could be, you know, signed, that the
25 prices are sufficiently high that they exceed, in our

1 view, the long-term marginal cost and can absorb quite a
2 bit of the fixed cost.

3 The issue would be the extent to which
4 they can persuade counterparties under the prevailing
5 conditions to sign these kind of contracts at these
6 prices, but if Manitoba Hydro can do it at that level,
7 the way we saw it, then we're very much comfortable with
8 it.

9 THE CHAIRPERSON: Were you -- in coming
10 to that tentative conclusion, were you aware of the
11 increasing estimates of the construction costs?

12 DR. ATIF KUBURSI: No. I mean, at that
13 time, we did not know about the extent to which some of
14 these costs have really come, but it would -- would not
15 be a -- a stretch to work out these extra costs and --
16 and see. The margin that we saw was really sufficiently
17 high that we were very comfortable. But I would very
18 much be concerned here to see that all these costs and
19 the escalations and what would it really take before this
20 margin is totally wiped out.

21 No -- no question about it. The
22 escalation in cost would impinge on -- on this judgment.

23 THE CHAIRPERSON: The other comment I had
24 was you indicated the other day, you used that old saying
25 about not putting one (1) -- all one's eggs in one (1)

1 basket, and you were commenting on the basic commonsense
2 wisdom of splitting between firm and opportunity sales.

3 When you were coming to this tentative
4 conclusion, were you aware of the present level of
5 opportunity sale prices?

6 DR. ATIF KUBURSI: Absolutely. I mean,
7 given the prices prevailing in the opportunity market,
8 and the likelihood that they might remain at such low
9 levels, this is the counterargument to escalation of
10 costs.

11 You see, there are two (2) opposing
12 forces. The -- there's no seller's regret in this market
13 at this time. Actually, the opp -- the opposite is true
14 here.

15 And one has to balance the decline in the
16 opportunity costs against the escalation of the capital
17 costs, but -- but these things can be worked out, and I'm
18 sure any reasonable accountant -- and it doesn't take an
19 economist to do that.

20 THE CHAIRPERSON: One (1) of the key
21 points you seem to be focussing on is the -- you -- you
22 talked about irreversible.

23 By irreversible, and just in plain
24 English, what you're saying is once bought, you have it.

25 DR. ATIF KUBURSI: Yeah. I mean, the --

1 there is always a concern that you might end up with
2 stranded assets.

3 I mean, this is a -- also one (1) of this
4 quotation is that you build an asset capacity, and then
5 you're not able to use it. I know of a situation now in
6 Quebec Hydro where there's some generators are costing
7 incredible amount of money that have to be aerated so
8 that humidity does not corrode these things, but they
9 cannot put them on stream because there is excess supply.

10 So it shows that once you have committed
11 the building of this generating capacity, you cannot
12 unravel it. You cannot take a dam, and chop it into
13 pieces, and take it to market, and sell it to -- to
14 others.

15 THE CHAIRPERSON: You talked about
16 Ontario in your bill, and one (1) portion of your bill
17 being the paying off of, I guess you'd call it, setoff to
18 side debts of Ontario Hydro resulting from past
19 decisions.

20 DR. ATIF KUBURSI: No, abs -- absolutely.
21 I mean, the people of Ontario are now saddled with past
22 mistakes, and that the escalation of the cost of the
23 nuclear reactors, and decommissioning, and we will pay
24 for it for generations.

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(BRIEF PAUSE)

THE CHAIRPERSON: Thank you.

CONTINUED BY MR. GAVIN WOOD:

MR. GAVIN WOOD: And then going on to Finding 15, please, begin -- beginning at page 218 of the KM Report.

DR. ATIF KUBURSI: As I argued yesterday, we found that the estimates by the NYC of the cost of a drought to be glaringly low, and they're predicated on misspecification of the probability.

We were equally unsatisfied with IFC's (sic) calculation of these probabilities, and we have really comments, and maybe I can go over them.

They have mistakenly specified confidence intervals. They have subsumed standard normal distribution on events that are not independent, and they've argued they're not independent.

And we felt that even the same no sale estimates of their retained earnings declined because of a five (5) year, or seven (7) year drought were slightly an underestimate, even in KPMG.

Our estimates, as we tendered them in the corrections, are a bit higher.

1 THE CHAIRPERSON: Sir, one (1) question I
2 might as well get rid of before it goes out of my aging
3 brain, you indicated before that you thought the NYC
4 advanced the thought that the -- Manitoba Hydro's focus
5 on the drought was a cover for the real concerns of the
6 long-term contracts.

7 Can you explain in plain English what's
8 that -- what that argument is? Like how -- how would
9 that argument be advanced?

10 DR. ATIF KUBURSI: I mean, she -- what
11 she is really saying is that they are using the drought
12 as a sort of a scare that would justify raising the rates
13 and persuading the Board to acquiesce and pass higher
14 rates to consumers. And that in the absence of the scare
15 about the drought and the willingness to create a buffer
16 zone or a buffer cushion against this, these rates might
17 not be allowed. These rate increases may not be allowed.

18 So this was their argument, is that
19 they're using it a bit of a boogeyman and trying to scare
20 the Board and the citizens of Manitoba to acquiesce to
21 higher rates than would be necessary.

22 The real issue here is that the exposure
23 to drought is far lower and of a less consequence than
24 what the real risks are. What could really happen when
25 you cannot back out and when you have these firm

1 commitments at such low prices that could be overridden
2 by the market and have to import at adjusted prices to
3 satisfy your commitments?

4 THE CHAIRPERSON: So it's back to the
5 difference between an irreversible decision that you can
6 make as opposed to an expectation of almost certainty
7 that droughts do happen?

8 DR. ATIF KUBURSI: You -- you can put it
9 that way, yes.

10 THE CHAIRPERSON: Thank you.

11 DR. ATIF KUBURSI: Thank you.

12

13 CONTINUED BY MR. GAVIN WOOD:

14 MR. GAVIN WOOD: This was referenced
15 yesterday afternoon. The -- the doctors had the
16 opportunity to review the conclusion section at page 221.
17 And what Dr. Kubursi and I decided to do is blame that on
18 Dr. Magee.

19 Do -- do you recall that, Dr. Kubursi?
20 For some reason, it -- it should, of course, read in the
21 middle of page 221 15 findings, and inexplicably, number
22 7 got -- got dropped, and we -- sorry for that.

23 At least we know somebody read the report,
24 Dr. Kubursi. Turning --

25 MR. ROBERT MAYER: My concern is, Gavin,

1 that I'm the only one who appears to have read the
2 report, or at least that portion of it.

3

4 CONTINUED BY MR. GAVIN WOOD:

5 MR. GAVIN WOOD: Turning to Section 12 of
6 the Direct Examination, and going on then to Chapter 6 of
7 the report beginning at page 225.

8 Could I ask you, Dr. Kubursi, to begin
9 with, in -- in your own style, to explain what Dr. Magee
10 and yourself attempted to accomplish and -- and the way
11 you went about it in -- in Chapter 6.

12 DR. ATIF KUBURSI: Absolutely. One (1)
13 of the major re -- points in the terms of reference or
14 what is expected of us and the terms of engagement that
15 we were given is to quantify risks, that it's not
16 sufficient to enumerate risk or to position them on a
17 risk map and, say, Oh, this is the likelihood; this is
18 the consequence. You really need to have numerical
19 measurable estimates.

20 And we felt that this is what is required
21 of us. And we wanted to do two (2) things: One (1) is
22 trying to get this quantitative measurement. And we
23 wanted also to make sure that we can use all the
24 information that is possible to do this and to do it in a
25 proper, statistical fashion, all right.

1 Let -- let me explain in plain English
2 what I mean. It would have been much nicer and, indeed,
3 probably more in the context and what people see here is
4 the integrated financial forecast; to do things using
5 numbers and statistics that Manitoba Hydro provides,
6 right. Because when you want to calculate and quantify a
7 risk, you have to basically say, What -- what's your
8 objective here.

9 Our objective here is to see how any one
10 (1) random event could adversely affect some key
11 variable, and the key variable fixated on is net revenue.
12 And net revenue is gross revenue, which is price times
13 quantity; whatever you said. In the domestic market it's
14 the rate times the load; in the export market, the firm
15 times the export price. The -- and the opportunity is
16 the day ahead or the real time. These are the total
17 revenues. Then you take the cost: the cost of
18 production, the rental price of water, the labour, the
19 amortization. You could go even to the interest rate on
20 the debt, and so on. So we put this as they were.

21 We treated everything as far as we can,
22 possibly can, as random variables. They could change.
23 We don't know how they would change, but we have some
24 idea, because we have the past. So we used seven (7)
25 years, and as independent consultants, we felt what is

1 worse, or what can be better than using the statistics
2 that are generated by an independent, reliable,
3 statistical bureau we call Statistics Canada? We felt
4 that as independent consultants coming to this issue
5 without any fixed positions, they will use the numbers of
6 an independent agency.

7 Secondly, we felt like if we were going to
8 start getting prices of long-term contracts and put it in
9 our equations, and somebody want to ask us, we're very
10 likely going to use confidential data, and God help us
11 with lawyers and things. I mean, we have enough with Mr.
12 Gavin.

13 But the point that is really crucial here
14 was for us to use data that are in the public record.
15 Now, we admit, and we have no problems at all admitting
16 that, we are not in the best position to say, This number
17 by Statistics Canada is inferior to this number in
18 Manitoba Hydro. And Manitoba Hydro felt that some of
19 these numbers are probably not the right numbers, but
20 they don't have a quibble with us.

21 If you really want to settle this, get
22 Stats Canada, make them sit next to us here or put them
23 on the witness stand, and let's see where they get these
24 numbers. But for us, as statisticians and as
25 researchers, we have continuously and we continue to use

1 Statistics Canada as the most reliable set of data that
2 an independent agency specializing in these things would
3 do it.

4 Now, they have different definitions, we
5 agree. They have a calendar year instead of a fiscal
6 year, they have a -- a different nomenclature that they
7 have to use across all utilities in Canada and not only
8 Manitoba Hydro. We recognize these things, but for us,
9 if the choice was to use something that might put us into
10 confidentiality issues, to use something that might be
11 from one (1) party to which we are really trying to
12 evaluate, we felt far more comfortable to use the numbers
13 that are coming from Statistics Canada.

14 And we have seven (7) years, and these
15 seven (7) years is a limited number, I know. I mean, I
16 would have loved -- in a -- in a perfect world, I would
17 like to go twenty (20) and thirty (30). I mean, thirty
18 (30) is -- is -- is a small sample, and -- and we'd like
19 to have more, but we felt that these numbers were also
20 representative. I mean, this is a period which included
21 very low water levels, 2003/2004, and very high water
22 levels, 2006/2007. So in some sense, we felt that this
23 was not a very biased or narrow set of data, but it gives
24 you a wide range.

25 So we used this data, and we didn't

1 believe this data. Say, Okay, Stats Canada is great and
2 we love it and everything, but we want to really look and
3 see: the seven (7) years, where did they come from,
4 these numbers? Does there exist a probability density
5 function that would represent these? And we fit a
6 probability density function, and we had fifty (50)
7 probability density functions we could fit to it. And
8 which one do we choose? Well, we did mechanically, but
9 with a spic span (phonetic) concern for statistics that
10 would not upset my colleague, we used the inverse of a
11 chi-square distribution.

12 Maybe, Lonnie, you want to explain, you
13 know, how these things...

14 DR. LONNIE MAGEE: Well, the -- there
15 were a number of variables that we wanted to treat as
16 random, so in the simulation, you need to decide what
17 distribution they should have, and as Atif just
18 mentioned, there's a -- a whole bunch of distributions
19 that you could pick.

20 So this chi-square test that Atif referred
21 to is kind of like a -- a score, where the bigger the
22 number is the worse that distribution is at matching the
23 numbers that you have.

24 So it's kind of like a golf score, I
25 guess. The higher it is, the worse it is. So, I guess

1 you could think of the process as being like a series of
2 golf tournaments. You pick this one (1) variable, and
3 then you're decided which distribution wins the
4 tournament to see -- that -- that matches it the best.

5 So you calculate this score for each
6 distribution, the smallest one we'd consider as the --
7 the best one to match that, what you actually saw in the
8 data.

9 So one by one for each variable, conduct
10 this little tournament with these chi-square numbers,
11 pick the distribution that fits that variable the best,
12 and then proceed.

13 So, there are other ways it could have
14 been done, but one -- one of the reasons why we -- we
15 considered so many distributions is that this is similar
16 to the software that -- that Hydro is using, and we -- we
17 kind of wanted them to encourage -- encourage them to
18 explore using a lot of different distributions that
19 capture the data as well as they can.

20 MR. GAVIN WOOD: And -- and Dr. Kubursi
21 is just asking me to confirm that -- that -- what Dr.
22 Magee is talking about now begins at page 247 of the KM
23 Report, and runs all the way through to page 260.

24 Please go ahead, sir.

25 DR. LONNIE MAGEE: Okay, yeah. I was

1 pretty much finished, but those -- all those pictures
2 that Gavin just referred to are -- represent the
3 distributions that we wound up using for the different
4 variables.

5 MR. GAVIN WOOD: And -- and Dr. Magee, I
6 -- I just had alerted you to the fact that I -- I was
7 going to ask the -- the Board to note that you've written
8 actually a response to the Hydro rebuttal in paper 'D' of
9 Exhibit KM-3, the -- the response papers of KM.

10 And I -- I appreciate there's quite a bit
11 of material here, but in the response papers, you'll
12 recall, gentlemen, that there was a response to the
13 rebuttal of Manitoba Hydro, and Dr. Magee has, at the
14 bottom of page 6 and then on to page 7, dealt with the
15 concerns about a claimed flawed method -- methodology on
16 the part of KM.

17 And, sir, would you be kind enough just to
18 try to keep it simple, but just -- just what you're
19 trying -- what you're explaining there, please.

20 DR. LONNIE MAGEE: Yes. This is closely
21 related to what Atif was saying about using the
22 Statistics Canada data, which might seem like an odd
23 thing to do since Hydro is right here, and they have
24 numbers.

25 But it -- it has to do with, I think -- an

1 analogy is that being -- Hydro being a large public
2 corporation, an -- an analogy is that we have a long
3 history in economics of using Stat Can produced data on
4 government activities, and anybody can go and access the
5 Stat. Can. data, and conduct analyses of what governments
6 are doing and make suggestions, and think about it.

7 And it might -- they might be good
8 analyses, or bad analyses, but because governments -- or
9 we want them to be open and public, and everybody can
10 just say what they want to say, we really rely on the --
11 the reputation of Stat. Can. as an independent arm of the
12 government to report what the government is doing so that
13 we can all look at it, and say something about it, so.

14 Now, Hydro, of course, isn't quite like
15 the government exactly, but it's similar in that it's a
16 large public organization, and that we feel it's -- in --
17 in the long run, it's a good idea to have publically
18 available data on -- you know, to an appropriate extent,
19 on what the activities of the large public corporations,
20 and that anybody should be able to access that data and,
21 you know, assess and think about what's going on. So our
22 using the data is partly because we're -- it's what we
23 normally do as economists because we want to be
24 approaching this as independent consultants, so we use
25 independently produced data.

1 But, also, I think the -- the difficulty -
2 - so we have no -- as Atif said, no opinion or ability to
3 say -- to -- to make a judgment on whether the Stat. Can.
4 data is good or bad. But we -- we do hope that this
5 disagreement about the quality of the data would lead to
6 some improvements in how Stat. Can. records and report
7 activities of Hydro --

8 MR. GAVIN WOOD: Okay.

9 DR. LONNIE MAGEE: -- and other
10 utilities.

11 MR. GAVIN WOOD: Okay. Thank you. And
12 ju -- just again for the -- the Board and its -- its
13 internal experts, the -- the references that you've just
14 dealt with are at the bottom of page 6 of your response
15 paper. And as well -- and I -- I don't know if it's
16 necessary to turn to it now, but you've also at the very
17 end of the Direct Examination document, at page 67 of it
18 -- sorry, page 68 of it, right towards the end, sir, you
19 refer to page 5379 of the transcript. And again, that's
20 an exchange between Byron Williams and Dave Cormie.

21 And I don't think it's necessary to -- to
22 turn to it now. It's just, again, you're -- you're again
23 explaining the use of the Stats. Can. data for -- for
24 review by the Board later.

25 I would ask you, though, if you'd be kind

1 enough to turn to page 7 of your rebuttal document now.
2 And, again, you -- the -- you see there, sir, at the sec
3 -- start of the second paragraph it says:

4 "MH claims that even if KM had used the
5 correct Manitoba Hydro data, results
6 would still be unreliable due to flawed
7 methodology."

8 Could you -- could you go through the --
9 the work you've done for us there in -- in terms of your
10 response to the -- those claims of flaw.

11 DR. LONNIE MAGEE: Atif spoke about the
12 first point already about the seven (7) years, I think,
13 using --

14 MR. GAVIN WOOD: But -- but you -- you --
15 please, you -- you reinforce if you wish.

16 DR. LONNIE MAGEE: Okay. I think we
17 would have been happy to use more years, and we had to
18 make a judgment of whether to go with what we had from
19 Statistics Canada or to possibly have more years of Hydro
20 data. And, as I said before, we might have ended up with
21 better data covering a longer period using the second
22 approach. But we thought, given our roles as independent
23 consultants, it would be more appropriate to use the --
24 the Stat. Can. data. And we're hoping that if there is
25 some concerns about having done this, that we're flagging

1 an issue that would be constructively dealt with in -- in
2 the long-run by improving the Stat. Can. methods.

3 And, also, just to repeat what Atif said,
4 that this -- it's only seven (7) years, but it's not
5 seven (7) years of -- that consists entirely of extremely
6 low or extremely high water; there -- there's a mix
7 there.

8 MR. GAVIN WOOD: thank you. And then
9 going on.

10 DR. LONNIE MAGEE: Yes, the second --
11 that's the second point.

12 MR. GAVIN WOOD: Then -- then going on --

13 DR. LONNIE MAGEE: Yes.

14 MR. GAVIN WOOD: -- to the second point,
15 please.

16 DR. LONNIE MAGEE: So the second point --
17 I -- I think what might be -- the second point is that
18 we've treated some variables as random that are not
19 random. And I think what might be behind this concern is
20 -- is -- it's a tendency with working with observational
21 data, things that would have happened anyways.

22 If they can't be predicted, economists are
23 quite comfortable saying, if we don't what it is and we
24 can't easily find out exactly what it is, like future
25 values, we'll treat it as a random variable even if

1 someone normally wouldn't think of it as a random
2 variable. And -- and so part of it is just an extra
3 comfort or a tendency of economists to model unknowns as
4 random variables, even if they're determined by
5 deterministic processes. But if it's a deterministic
6 process with inputs that are themselves random, then what
7 comes out is also random.

8 MR. GAVIN WOOD: Dr. -- Dr. Kubursi and I
9 are trying to remember. You gave me an example of it,
10 explained to this simpleton. Do you still recall?

11 DR. LONNIE MAGEE: Well, being a
12 simpleton myself, no, I can't.

13 MR. GAVIN WOOD: But we're trying to
14 remember. It helped me. Do you -- do you recall it?

15 DR. LONNIE MAGEE: Well, I guess the --
16 it might have been just the -- the water flow. If you
17 don't know what water flows are going to be, you could
18 treat them as -- look at a -- a whole lot of possible
19 water flow sequences. Feeding them randomly into a model
20 as Hydro does, and then everything that comes out, even
21 though it's coming out as, in many cases, deterministic
22 relationships involving water flows and so on, is random
23 because some of what's fed into the calculation is
24 random.

25 Now, it could be that I'm not -- I'm --

1 I've missed the -- the -- Hydro's point, but it is --
2 it's worth -- I thought that would be worth saying, in
3 any case.

4 MR. GAVIN WOOD: And then item 3, please.

5 DR. LONNIE MAGEE: Right. So I think --
6 I think they're correct that -- that the process is not
7 stationary. A stationary process is a process that, even
8 though there's variation from year to year, there's some
9 tendency for the statistical properties of the process to
10 change over time.

11 So they mention load growth. So, for
12 example, over the seven (7) years, it wasn't just --
13 there was a tendency for load to grow over time because
14 of population and economic growth and so on. And I think
15 what -- what we're -- the point we're making here is that
16 you can still consider the -- the -- there -- there --
17 because there's a lot of random variation in addition to
18 that load growth, that we're still capturing a lot of the
19 -- a lot of the variation over that period is not just
20 because of some kind of deterministic growth, but also
21 random fluctuations.

22 Maybe I should just stop there.

23 MR. GAVIN WOOD: And -- and item 4?

24 DR. LONNIE MAGEE: Oh, boy. Right. Four
25 is -- I -- I think is -- is covering the same issue about

1 the Stat Can data --

2 MR. GAVIN WOOD: And 5, please.

3 DR. LONNIE MAGEE: -- that we're already
4 discussed.

5 MR. GAVIN WOOD: And 5, please.

6 DR. LONNIE MAGEE: And -- and so is 5.

7 MR. GAVIN WOOD: Okay. Thank you. Dr. -
8 - Dr. Kubursi, turning back to yourself, at the bottom of
9 page 54 -- sorry, at the top of page 55 of the direct
10 examination, there's a reference there to sections 6.2
11 through 6.4 of the report. Would you be kind enough to
12 summarize what's carried out there, appreciating, I
13 believe, that Dr. Magee has covered that in part, yeah?

14 DR. ATIF KUBURSI: There's no question
15 that most of the activities of Manitoba Hydro involve
16 minor or no risk at all, and these have short-term
17 duration and can easily be dealt with. But there are a
18 number of activities that have a very high probability of
19 occurrence and have very high consequences.

20 Examples of this would be drought, long-
21 term contract, expansion of capacity, but -- but these
22 are quantitative issues. I mean, the NYC said, Well, I
23 don't think drought is such an important one and it's a
24 bogey thing. I mean, these things we can settle by
25 looking at the numbers, and that's exactly what we tried

1 to do in chapter 6.

2 There are risks that happen in isolation
3 of other things, but there are certain variables that
4 could independently change or they're correlated. And
5 what we tried to do in chapter 6 is to use an iterative
6 process using a utility that is used at Manitoba Hydro.
7 We're quite happy with it. Probably it's not the best,
8 it should not be alone, but we wanted to demonstrate that
9 within Manitoba Hydro, there exists a system, and it's
10 possible to rely on it, on sketching at least the profile
11 of these risks with some quantitative numbers.

12 This is called PRISM, and at the hub of it
13 is something commercial called @Risk, which we acquired
14 and we hope to pass it maybe to -- we have the licence
15 for you, so that, in our absence, you could run these
16 things, too.

17 And what we found was very important
18 numbers, and we started by saying, All right, let's first
19 profile the base case because you cannot talk about
20 impacts of a changed situation unless you have
21 benchmarked a base case. So we took the base case to be
22 the average over the period 2001-2007. Then we selected
23 every variable to be random, and we assigned to it a
24 probability distribution that we considered to have the
25 lowest chi-square for the reasons that Lonnie gave you.

1 And then we looked and see what would be
2 the impact of changing one (1) variable at a time, and
3 then in combination, and see how this is going to impact
4 retained earnings or net profits or net revenue. We did
5 first and said, All right, we would now look at that
6 average and depress generation in proportion to
7 depressing the water level, everything remaining the
8 same, to the lowest minimum in 1937-1942, and check to
9 see what would be -- the net revenue under the same
10 circumstances would be. And we found it to be -- and all
11 these things are reported actually in Table 6.2 of the
12 report.

13 MR. GAVIN WOOD: And that's -- and that's
14 found at page 229 of the KM Report, 229, sir.

15 DR. ATIF KUBURSI: And we -- we found,
16 for example -- so the base case, yeah. Oh, sorry. I
17 need to be in the mic? Okay. Sorry. I like to be near
18 you, Lonnie, but it's all right. Okay. So the --

19 MR. GAVIN WOOD: What about me?

20 DR. ATIF KUBURSI: No. As far away as I
21 can. Okay. So what we found is that the average revenue
22 in the base case, the expected revenue, was four hundred
23 and forty-five (445), and if you look at the picture that
24 comes directly from using that @Risk, which is on the
25 page before --

1 MR. GAVIN WOOD: Page 228.

2 DR. ATIF KUBURSI: If you look at the
3 mean, and that's the average, you'll find the four forty-
4 five (445), the one I'm talking about. You can easily
5 read also at the 5 percent and at the 95 percent level
6 what these revenues would be, and I have classified these
7 things as minimum and maximum, all right? So you could
8 really look at confidence levels and the averages, what
9 that base case based on averages would be.

10 The next thing we did is we allowed the
11 flow in 1940 to prevail under the same circumstances, and
12 this net revenue went down to negative three hundred
13 forty-three (343). But compared to the base case, it
14 would be seven hundred eighty-eight (788) -- a negative
15 seven hundred eighty-eight (788). So you need to --
16 instead of making the average four forty-five (445), you
17 realized a loss of three forty-three (343). Compared to
18 the average, you lost seven hundred eighty-eight (788).

19 Now we said that this is not really the
20 situation. Let's see what if we were to use a lower
21 minimum than that, the one we got at the 2.5 percentile
22 level we talked about. But we said, Look, we cannot do
23 this without allowing also some curtailment that have
24 really been written into the contract. So we built these
25 things in, and we got actually a lower loss so that

1 somehow the curtailment doesn't do much big things, but
2 at least it lowers the exposure level that we have, all
3 right, to the tune of about \$66 million.

4 Then we looked and say, But there are
5 situations where a combination of adverse effects may
6 happen. And we allowed this to be the case, low flow of
7 1940, no curtailment, and high import prices of the type
8 that prevailed in the drought of 2003/2004. And the
9 numbers would grow immediately to 1.2 billion, all right.

10 Now, people say, Well, all right, that's
11 not -- that's not fair because it has a very low
12 probability of occurrence and why does it have low
13 probability to occurrence. Because the probability of a
14 drought is for one (1) year is -- what was it? One (1)
15 in seventy-two (72), you know, very low, point o-one
16 eight (.018) or something, like 1.8 percent. And then
17 the probability of having a higher oil -- higher gas
18 price is a probability, so the joint probability, if
19 these are independent and are not correlated, will be one
20 (1) times the other, it gets a much smaller one.

21 But then it would really be necessary
22 here, and for you to be comfortable with some of these
23 numbers, is to ask us, Well, what is the joint
24 probability of these two (2) things happening. IC -- ICF
25 was very happy to see it's half. It could be higher, it

1 could be lower, so make it half, multiply, so low, way
2 beyond the '99 confidence level. Forget it. It's too
3 stress of a test. Let's go home. It's not going to
4 happen.

5 We -- we were not willing to go that far.
6 We said, All right, we don't know. We're going to use
7 the Monte Carlo, which gives you all possible
8 likelihoods. We ran it one thousand (1,000) times. And
9 that's what really gave us the comfort to look at what
10 would be the quantitative impact of a joint activity, not
11 knowing, but allowing it to be a random event, what would
12 happen at the mean value, all right.

13 Then we tested many other things. We
14 changed primarily the import -- the load. We increased
15 the load by 10 percent, and it didn't mu -- do much. We
16 -- the import prices seem to be a very crucial variable;
17 you really have to worry about it. This is something you
18 have no -- need to monitor and keep abreast of
19 developments on this one.

20 Everything else, including the interest
21 rate -- I mean, it was something but -- but not really a
22 major change. We tested exchange rate changes because it
23 works on both sides of the ledger. The impor -- the --
24 we have to import and we export. We have to pay debt.

25 So, as you can see, if we allowed a 10

1 percent appreciation, the Canadian dollar did not do
2 much, to about -- I mean, I don't want to say 33 million
3 is nothing between friends, but -- but compared to the
4 1.2 billion, yeah. I -- they can absorb it in one (1)
5 night if they -- if everybody at Manitoba Hydro skips
6 lunch, we'll -- we'll be all right.

7 But the -- the problem became with -- with
8 the interest rate. And, you know, we went down all these
9 things. We -- we also tried later on to bring investment
10 -- investment changes and escalation costs is -- would
11 have large impacts too. I mean, the real three (3) key
12 variables would be drought, escalation of import prices,
13 escalation of investment costs. Every -- every other one
14 is something that you could live with.

15 And this is really what we have here. And
16 we went through, you know, worst-case scenarios. We went
17 through with interest rate, without interest rate. See
18 the -- the trouble with the interest rate is that the
19 level of debt is high. And a very small change in
20 interest rate on a 6 billion or \$7 billion debt, is not
21 something to treat trivially.

22 And in that respect, you know, another
23 variable to be quite sensitive about, particularly now as
24 we are about to invert the -- you know, the yield curve,
25 I mean, there's some -- some concerns that interest rates

1 are not -- not going to remain at such low levels, and
2 this would have, especially if you're going into a major
3 investment activity with large component of debt, that's
4 something to take very serious. So this is really what -
5 - what I have to say.

6 MR. GAVIN WOOD: Thank you. Dr. Magee,
7 you -- I'd -- I'd asked you to get ready to comment on
8 Table 6.2 as well. Would -- would you, please?

9 DR. LONNIE MAGEE: Yes. There was some
10 discussion earlier in the -- the hearings that we saw in
11 the transcripts about focussing on line 4 of Table 6.2
12 that Atif was also talking about.

13 And I think -- I just want to expand on
14 that a bit. I think there is a lot of common ground
15 between our view and what was expressed earlier in the
16 hearings. So as -- the -- the -- I think the -- the
17 simple way of putting what was being said earlier was
18 that line 4 where the net revenue stands out as being the
19 biggest loss, minus 755 million, was, according to our
20 own model, very -- based on a scenario that's very
21 unlikely.

22 And they figured that out in a, I thought,
23 kind of a clever way by just based on the diagrams that
24 we had given, and -- and counting standard deviations,
25 and so on. And I -- I think they're right. That is,

1 according to the way we specified our model, a very
2 unlikely scenario. However, what our -- the probability
3 of that scenario is -- although it's unlikely in our --
4 our own -- according to our own model, is also way out in
5 the tail, and it's -- but not -- not so far out to be a
6 Black Swan event.

7 I think it's, you know, quite plausible
8 just on intuitive grounds that you could have a drought
9 at 1940 flows and import prices at the level that -- that
10 we'd specified. It's just that when you get way out --
11 that far out in the tail, your -- your probability
12 estimates may not be that accurate.

13 However, there's so many variables, so
14 many combinations that when you combine unlikely events,
15 you may happen to hit on something that just happened to
16 not occur in the data, but could -- you know, just on
17 intuitive grounds could -- could have plausibly happened.

18 So what we're basically just trying to
19 show there, as -- as Atif mentioned, is that that
20 particular combination of drought and high import prices
21 is -- is one (1) -- the one (1) that we -- we think is
22 the, you know, the one (1) to focus on as being something
23 that could happen. We can't say exactly how likely, but
24 the -- when you go up to the second row, the -- the
25 impact on net revenue of the drought 1940 flows, where it

1 doesn't say anything about what the level of high import
2 prices was, that one (1) differs from the fourth line
3 because the second line allows for import prices to be
4 whatever they could be according to the distribution.

5 So even by -- so it's -- it's as if you
6 took the fourth line, but you said, No, let's not say
7 it's high import prices, let's say it could be any of the
8 import prices according to our procedure. You go up to
9 the second line, so the average net revenue averaging
10 across all the different import prices possibilities
11 would be a loss of minus three forty-three (343). So
12 anyway, I think that's...

13 MR. GAVIN WOOD: Thank you. Dr. Kubursi,
14 at the -- at the bottom of -- just below that Table 6.2
15 at I believe it's page 59 now of the direct examination,
16 there's a reference to a probability of drought, and I
17 believe here that ties back to page 13 of the direct
18 examination where the -- there was an explanation of a --
19 a change in the calculations that you talked about
20 yesterday.

21 Could I ask you just to summarize that
22 again, please?

23 DR. ATIF KUBURSI: Yeah, yes. I think
24 it's -- it's helpful if I would go through these
25 calculations and reaffirm them for the record.

1 MR. GAVIN WOOD: And you're at page 13
2 now?

3 DR. ATIF KUBURSI: I'm at page 13. As we
4 talked --

5 MR. GAVIN WOOD: Of the direct exam --

6 DR. ATIF KUBURSI: Of the direct.

7 MR. GAVIN WOOD: -- direct examination,
8 the document we were working with yesterday and today.

9 DR. ATIF KUBURSI: What we have here is
10 the statistical technique we call the autoregressive, and
11 it has multiple lags, and we found that the best one that
12 captures the inner workings of the series is
13 autoregressive 3, with three (3) lags. And we simulated
14 this and resampled residuals for 1 million years.

15 For the five (5) year drought, and we
16 looked at every consecutive five (5) year period from
17 this, we took random -- first one (1) and then took the
18 five (5), then another one, five (5), a million of these
19 things. We found that, and if we are to average them,
20 that the minimum in these that would be below the 1987-
21 1991 would be about 1.4 percent probability. If we look
22 at them to be below 1937-1941, we got another probability
23 for it, and this was even less than 1 percent. When we
24 took seven (7) consecutive years, the probabilities got
25 even lower. For something, the seven (7) year average

1 during '36-'42, it was like 1.3 percent.

2 So we tried to get what would be the
3 likelihood of observing a minimum from all these sampled
4 averages that is lower than the one that we actually saw
5 in '87-'92, in '36-'42, and we assigned probabilities.
6 And you can see these probabilities are extremely low,
7 right?

8 The next thing was to do is to take these
9 and see what would be the various consequences of these.
10 As I've already indicated, that for one (1) year, with no
11 other adverse event, the cost is 788 million. You cannot
12 think of a five (5) year to be a multiplication of seven
13 eight eight (788) times five (5) because there is a
14 chronology. And what we allowed this chronology to be is
15 by looking at consecutive things, and we found out that
16 this would go for 3.3 billion. This is higher than
17 Manitoba Hydro estimate of 2.7. And we went to the seven
18 (7) year drought, and this could be 4.5 billion.

19 Either one (1) is larger than the current
20 accumulated returned earnings, and this for us is -- is -
21 - is quite important because some of the recommendations
22 that we had tendered are contingent on these findings.
23 We did not want that we use singularly returned earnings
24 as the cushion against droughts. We wanted to complement
25 it, supplement it with other considerations, and that's

1 why we've recommended that there may be a rider on the
2 rates, we might want to consider leaving more water.

3 We know that water is not extremely
4 valuable, you know. Like 1 foot extra in Lake Winnipeg
5 is 2,000 gigawatt. Even if it's a hundred dollars, we're
6 talking about 200 million, but it's not the issue. You
7 have to compare it to what you might have to go in terms
8 of disruption and what you might have to buy at
9 congestion prices or complete adverse market conditions.
10 It depends what is the alternative that you bill.

11 And when you're talking about droughts you
12 -- you're try -- and you're trying to deal with risk, it
13 -- it may be worse looking at what we consider to be
14 minimum regret. This is the strategy that is used, where
15 you try to minimize --

16 MR. GAVIN WOOD: Sorry, that phrase once
17 again.

18 DR. ATIF KUBURSI: Minimum regret, all
19 right, where you take very adverse situations and factor
20 them in. I mean, it comes close to what Taleb used to,
21 you know, want us to deal with the Black Swan, but not
22 that far. But it is -- you want to make sure that even
23 the worst thing that happens, you are prepared; you
24 minimize regret. Thank you.

25 MR. GAVIN WOOD: Thank you. Mr. Chair,

1 just before possibly the morning break, we're -- we're
2 just at a good point of being able to finish off with the
3 KM Report.

4 Turning to page 62 now of the direct
5 examination. Dr. Magee, I -- I think early on you had
6 confirmed to me, sir, that chapter 7 of the report is
7 simply a compilation of conclusions and recommendations.
8 And I think Dr. Kubursi and yourself felt it wasn't
9 necessary to go back over those again in -- in your
10 direct examination.

11 DR. LONNIE MAGEE: Correct.

12 MR. GAVIN WOOD: Dr. Kubursi and Mag --
13 and Dr. Magee then, dealing with point 14, if you would
14 just summarize for me your -- I know you've set out here
15 you -- you believe that you haven't been able to succeed
16 in your report in dealing with the terms of reference. I
17 -- I wonder if -- possibly Dr. Kubursi to begin with,
18 there's a couple of interesting statements in there. You
19 talk about how a different team would have produced a
20 different report and such.

21 Could you just elaborate on that for a
22 moment, sir?

23 DR. ATIF KUBURSI: We're -- we're happy
24 to speak about limitations. We -- we wanted to emphasize
25 -- and I've tried through the direct here to continuously

1 refer to the fact that you're seeing things through the
2 eyes of economists and statisticians. That this
3 gestaltist, this fixed perception, I mean, colours the
4 way we look at things. We come trained with a particular
5 view of the world, and our discipline looks at things
6 maybe in a way that might not be the one (1) hydrologists
7 or engineers and others who -- and -- and we're not going
8 to apologize for it, but at least raise a red flag that
9 we're economists after all, I mean, for good or bad, and
10 some of the issues have been seen through the eyes of
11 trained economists.

12 We also wanted basically to say that there
13 are lots of issues here over which we have reached
14 conclusions that reflect our views, and maybe a different
15 team with different expertise may have reached -- or
16 could reach different things. These are issues over
17 which there could be reasonable arguments.

18 And we're prepared to defend our position,
19 but we're also willing to concede that there are possible
20 ways -- different ways than seeing us. To the best of
21 our knowledge, we tried as much as we can, and we have
22 been extra careful to feel that we are not adversarial;
23 we're independent. We're trying to help.

24 Our marching orders were to be available
25 to all, that we could, as much as possible, see how the

1 people of Manitoba, looking at their utility, which is a
2 major substantial node of activity here, can deal in what
3 we consider to be better and to come to assessment
4 different than some of these enunciated, perhaps
5 irresponsibly, by the NYC and others that had scared the
6 people of Manitoba that dependable energy is not to be
7 depended upon and that blackouts and that major things.
8 But we still committed and feel strongly that the risks
9 are not probably physical, although God knows, you know,
10 why we're talking about, given our limitations, but there
11 are serious financial issues to be dealt with and that
12 should be hard-nosed assessment of these, particularly as
13 you embark on a very massive decade of investment and
14 commitment of resources that you need to really look at.

15 And here, I think, you might want me to go
16 through this one.

17 MR. GAVIN WOOD: Oh, well, after the
18 break, sir.

19 DR. ATIF KUBURSI: Oh, after the break,
20 okay.

21 MR. GAVIN WOOD: Okay.

22 DR. ATIF KUBURSI: You scared me, but
23 that's okay.

24 MR. GAVIN WOOD: Dr. Magee, anything
25 further.

1 DR. LONNIE MAGEE: I couldn't add
2 anything to that.

3 MR. GAVIN WOOD: Sir, we just have a -- a
4 short further presentation af -- after the break
5 possibly.

6 THE CHAIRPERSON: Okay. When -- when you
7 come back I just want to make one (1) comment on
8 something Dr. Kubursi talked about. He talked about the
9 concept of minimum regret, which I think I understand.

10 I'll leave you with a question over the
11 break too. And if as -- as you suggest, the -- the
12 chosen primary focus was to be keeping production costs
13 and domestic rates as low as possible, or as reasonable
14 as possible, and given the information and the variety of
15 factors and risks that has been available to you, and
16 based on your work, is it possible that the -- that
17 lowering rather than increasing the reliance on the
18 export market represents the prudent course for Manitoba
19 ratepayers?

20 I'll leave you with that thought and we'll
21 have the break. Thank you.

22

23 --- Upon recessing at 10:56 a.m.

24 --- Upon resuming at 11:54 a.m.

25

1 THE CHAIRPERSON: Okay. Welcome back,
2 everyone. Mr. Wood...?

3 MR. GAVIN WOOD: Thank you, sir. The --
4 the question that was put at the break, what the doctors
5 would prefer is to incorporate it into their series of
6 responses at tab -- at question area 15 at page 63 of the
7 -- of the direct examination. If -- if that's -- if
8 that's all right.

9 THE CHAIRPERSON: Yes.

10

11 CONTINUED BY MR. GAVIN WOOD:

12 MR. GAVIN WOOD: Dr. Kubursi, you'll
13 recall, sir, that I had an opportunity at the end of the
14 KPMG panel testimony to hear a series of exchanges
15 between the Board and the KPMG experts. And that led to
16 a discussion, you'll recall, between yourself and I, sir,
17 and -- involving Dr. Magee as -- as well.

18 And ultimately, what we've done is we've
19 taken the series -- or at least most of the questions
20 presented, and we've set them out at page 63, and you --
21 you -- Dr. Magee and yourself thought it would be
22 appropriate for -- for -- given the nature of the
23 questions, that the two (2) of you respond to them as
24 well, for the Board's assistance.

25 And you'll recall, sir, that just before

1 the break there was a -- a question raised with regards
2 to primary focus, keeping costs and rates reasonably low,
3 dealing -- and in terms of the risks that you had -- have
4 found, and that, ultimately, would it be better to lower
5 the emphasis on export market, in -- in a few words
6 summarizing a -- a much longer question that was raised.

7 And as I understand it, you would prefer
8 to incorporate that into the answer to Question 1, okay?
9 If I could bother you to go ahead, then, sir.

10 DR. ATIF KUBURSI: Maybe if I can invite
11 the Chair and the Vice-Chair, please, look at page 61.

12 MR. GAVIN WOOD: Sixty-three.

13 DR. ATIF KUBURSI: Sixty-two in your --
14 sorry.

15 MR. GAVIN WOOD: Sixty-three.

16 DR. ATIF KUBURSI: Sixty-three. Okay.

17 All right.

18 MR. GAVIN WOOD: In any event --

19 DR. ATIF KUBURSI: In any event --

20 MR. GAVIN WOOD: -- the chart, please.

21 DR. ATIF KUBURSI: Yeah. In any event,
22 the questions we felt pertain to classical decision-
23 making issues, and we're -- I'm going to begin with a
24 very simplistic and simple way of looking at things, and
25 then complicate it. We're going to talk about two (2)

1 options, expand or not expand, export or not export --
2 any binary choice. And two (2) possibilities of the
3 states of nature where things are favourable and things
4 are unfavourable.

5 I mean, you could think of it as a person
6 deciding whether they would like to sell ice cream or
7 newspapers, and the two eventualities, sunshine or rain.
8 Of course, one would find it very easy, if it is going to
9 be sunshine, then you sell ice cream. And if it's going
10 to be rain, you sell newspapers.

11 The issue is, even the simple question for
12 our little kids depends on the probability of raining,
13 because somehow the states of nature are not equally
14 probable, but there could be an issue here as what is the
15 likelihood of a particular state of nature.

16 Now, in the event of expanding or not
17 expanding -- and it's not only two (2) binary options, as
18 indeed the kid could really not do anything or go on a
19 vacation or maybe sell chocolate or something else. The
20 options that are open to us will be expand or not expand.
21 I'm going to leave them, but it could be expand when, you
22 could stagger things. So there could be a much broader,
23 richer range of options.

24 The other thing is that it's favourable or
25 not favourable, but there could be a whole spectrum of

1 how favourable it is: strongly favourable, poorly
2 favourable, marginally favourable, unfavourable, strongly
3 un -- I mean, we could have a complete list.

4 So let's take now and begin with the
5 simplest of these two (2) options: expand or not expand,
6 invest or not invest. And the two possibilities of the
7 states of nature that the conditions are favourable or
8 not favourable.

9 So the intersection of the first one is
10 that you expand and the states of nature are on your
11 side. Then there will be high returns. There would be -
12 - the exports would be sold at favourable terms, there is
13 the market there, and the rates of returns are high.
14 There is always a question how high, and what is the net
15 present value, but -- but these things can be calculated
16 under these circumstances.

17 Now, the story becomes completely dire if
18 you were to expand and things turn unfavourable. The
19 market remains constrained, the prices at which you were
20 going to export are low, the interest rate is high,
21 inflation is high, the cost of capital is high. All
22 these conditions would really mean there would be major
23 losses, and you could end up with stranded assets because
24 of the irreversibility, and you cannot fractionate what
25 you have done, and the losses would become massive and

1 intolerable.

2 Now, you could not expand because you're
3 so worried and fixated about things turning negatively,
4 and you may end up losing quite a bit of opportunities.
5 There is all these lost opportunities you could have made
6 if you were to expand. And there is going to be also the
7 possibility that you have delayed and you became
8 unwilling to take action that you might even lose meeting
9 your own domestic load because you have failed to expand
10 at the appropriate opportune time that you probably
11 should have done.

12 Or you could go to the place and say,
13 Well, I don't expand and things didn't really turn out,
14 and you have all these avoided costs in the sense that,
15 look, I mean, I could have really lost, but I didn't
16 because things turned out.

17 So the issue here now at this -- it's a
18 very simple question: what do we do? All right, now we
19 have outlined these four. Actually, you all recognized
20 it all would boil down to the circumstances. You could
21 outline all these issues.

22 For example, if I'm going to look at
23 returns, then I'll need to know the prices. I need to
24 know the costs. I need to know the exchange rate. I
25 need to know the interest rate. I need to know the level

1 rosy world. It will be a strong recovery, high prices of
2 electricity, low prices -- sorry, high price of natural
3 gas, heavy concern for the environment, and maybe some
4 carbon taxes or, you know, gas taxes, whatever it is. It
5 would be a depreciated Canadian dollar. It would be a
6 low interest and a low inflation.

7 All right. If we put all these factors
8 down, and say the probability of all these things are
9 great, then it would be absolutely ludicrous to even
10 think that there is a choice. Of course it would really
11 make sense to expand. It would be only an issue of the
12 scale. It would be only issue of timing. All right.

13 Let me put it the opposite way. The
14 economy is recovering very slowly, inflation is really
15 high. The exchange rate is extremely high, the Canadian
16 dollar appreciating. The price of natural gas is
17 extremely low, price of electricity extremely low.

18 Under such circumstances, there would be
19 no choice -- it would make no sense whatsoever to engage
20 in any export program or even expansion.

21 Now, what if we have mixed states, right.
22 We have a slow but likely high likelihood of recovery.
23 It may take time. Most people say 2014 is going to be a
24 year where the economy is going to make a full turn,
25 right. But, I mean, let's say maybe they're right.

1 Let's say the interest rate would really be up higher but
2 not much. Inflation rate would be higher, positive, but
3 also not much. And let's look at the price of natural
4 gas, it remains low and price of electricity is low. I
5 mean, all these things are likely, all right. The issue
6 is how likely and how do they factor in.

7 And there you really need to do very
8 careful and precise calculations because you're talking
9 about a period. And the economists have a very simple
10 method, all right, in the sense that you want the
11 expected net present value to be positive, all right,
12 because -- and I say net present value because I'm
13 looking at the stream of net income, and it has to be
14 compared -- discounted at a particular discount rate to
15 be equal to the cost of replacement or the total capital
16 cost at the particular time.

17 And surely you recognize here that this
18 net present value and the expected value of it is going
19 to be high if these interest rates remains low, if the
20 price of what you sell is high, if the costs are really
21 low, and the situation is rigged in our favour and
22 capital costs are not escalating high levels. All right.

23 So what is the option to all this? And
24 where do we really stand? I mean, are we in a position
25 to stand up here before you and say with certainty that

1 the economy is going to recover, the price of natural gas
2 is going to turn around, the interest rate is going to
3 remain low, the inflation rate is going to remain low?
4 We can't.

5 But there are, and indeed, many
6 forecasters have come onstream and have portrayed a -- a
7 picture. And some of these are credible. Let's -- let's
8 look at the most credible forecasters and see what have
9 they said down the road.

10 The likelihood of the economy turning is
11 high according to these people, in the sense that we have
12 a business cycle. Any economist would tell you the
13 economies go through ups and downs and it has been now
14 down since 2008. And by 2014 it would be much longer
15 period of any medium-term business cycle. So the
16 chances, the likelihood that the economy would have made
17 its turn by 2014 is a very high likelihood.

18 But then there are correlated things, an
19 economy is never really high without bringing with it
20 high interest rate and high inflation, all right. So you
21 have to basically look at things in a bundled way. The
22 two (2) most difficult things at this moment to forecast
23 is the price of natural gas. And this is because of some
24 technological things that's coming.

25 And I've looked at natural gas and the

1 price of oil and things. I mean, in the past they used
2 to be so highly correlated and I could tell you without
3 any doubt that the price of oil is going to be higher,
4 and I can tell you why I would really come to this
5 conclusion. And then if there was this correlation then
6 the price of natural gas would have really been high and
7 this would automatically spill over into the price of
8 electricity and then we would be in a good favour of
9 things. At this moment, it's not easy given the new
10 technological breakthroughs in the shale gas to come to
11 any rosy picture about it. This is one (1) of the
12 largest imponderables.

13 The second-largest imponderable is the
14 interest rate. And this is really because of two (2)
15 opposing forces. We are a small economy in Canada. We
16 cannot maintain an interest rate in Canada that's
17 different than the US. Any moment the spread goes in our
18 favour the Canadian dollar would appreciate to levels
19 that would not be sustainable. So in many respects we
20 are an interest taker. So when we look at the interest
21 rate in Canada we're literally talking about the interest
22 rate in the United States.

23 What is the likelihood of the interest
24 rate in the United States going up. The prices of houses
25 are at lowest rates. There is quite a serious talk now

1 about another dip in the real estate market. There is
2 very much concern here that any small change in the
3 interest rate would bring major massive changes in the
4 values of real estate and homes because of the inverse
5 relationship between interest rates and prices of homes,
6 that the economy would completely be in a position not to
7 absorb it and would compromise any possibility of
8 recovery.

9 So there is really here now, two (2)
10 factors working in the same direction. There's very
11 strong pressures. I mean, the -- the story is coming
12 abundantly clear from the last -- first time ever in the
13 United States, Mr. Bernanke, the Federal Reserve chairman
14 of the board, had to hold a press conference and said, We
15 have to keep our foot on the pedal because without
16 quantitative easing, this economy would come to a
17 complete halt.

18 There has not been any perceptible
19 internal forces, propulsive forces for growth. But this
20 would really mean the American dollar is going to
21 continue to depreciate, which means our Canadian dollars
22 will continue to appreciate.

23 It all -- would also mean that there is no strength and
24 steam into the American economy that would propel it on
25 its own to grow. And it's going to really mean, sooner

1 or later, with this massive pumping of money, an
2 inflation rate is likely to rise.

3 So we're basically talking about a very
4 mixed bag of short and medium-term changes that will put
5 them more and more into the unfavourable conditions. And
6 this is really where the situation becomes we need to be
7 more cautious, we need to take time, we need to be
8 careful, we need to be flexible, we need to stagger. I
9 mean, I would really make a very strong argument now.

10 Remember, I'm talking as an economist, and
11 I and my colleagues are saying you're really putting down
12 economists. Yeah, but, you know, our record is not
13 great, we predicted nine (9) out of the five (5)
14 recessions. But the story is -- okay. Well, okay,
15 that's all right. Okay.

16 But -- but the story is, for the medium
17 term, I -- I mean, I have no qualms really going on a
18 limb to say that the economy will recover, but very
19 slowly, that the quantitative easing is being very
20 necessary, as the man himself at the helm is arguing,
21 that with this massive amount of money, the interest rate
22 is likely to remain low, but that the inflation rate
23 sooner or later is going to rise. And I cannot in any
24 way predict whatever's going to happen to the natural
25 gas, other than to say there is massive amounts of it,

1 are blessed in this area here with abundant water, and
2 this is a clean energy. And in a world where there is
3 going to be increased concern, but it's not being
4 translated on the ground, this is going to be a
5 favourable -- what we call in economics we have a
6 comparative advantage. It's a result of a natural
7 endowment, not man-made, but a natural endowment that we
8 have that we can capitalize on it. And economies that
9 have really done well are those who have really been able
10 to capitalize on their comparative advantages.

11 And in that respect, I have a very strong
12 argument that we should, that -- I am also cognizant
13 that, you know, you can't just rely on comparative
14 advantage in terms of endowment. You have to do your
15 hard-nosed, brutal calculations to make sure that you
16 don't embark on something unless you have, on the balance
17 of probabilities, things are going to turn in your favour
18 and not against you.

19 MR. GAVIN WOOD: Thank you, sir. Then at
20 the top of page 65 of the direct examination, the very
21 last paragraph under number 1, should the Board
22 understand that that conclusion is still in place?

23 DR. ATIF KUBURSI: I mean, as I argued, I
24 -- I'm saying the balance of probabilities, the way I see
25 them for the medium term, and that's all I'm saying, is -

1 - is favourable.

2 I mean, one (1) thing I could probably
3 elaborate a little bit about is that: what is the
4 exchange rate ultimately? The exchange rate in the short
5 term is a monetary phenomenon; it's a price of our
6 currency in terms of another currency or the price of
7 another currency in terms of our currency. So just the
8 price of potatoes or price of anything.

9 But, in the long run, it has more
10 fundamental things than just -- you know, if the price of
11 oil goes up now our exchange rate appreciates. If
12 interest rate changes, it appreciates. But,
13 fundamentally, in the end, it's the price that would
14 equate cost of production on both sides of the border,
15 all right.

16 And let's say the average cost, typically.
17 How do you have the average cost is basically by looking
18 at the total cost divided by output. And ultimately, I
19 don't want to go into a first-year economics here, it
20 basically is the cost of labour divided by -- this is
21 because of the variable cost -- by productivity.

22 If our wages in Canada -- think of it,
23 wages in Canada over average productivity in Canada and
24 wages in the US divided by average productivity. Why
25 average productivity? Because the cost of labour is not

1 really the only thing; it's the unit cost.

2 Like if my cost in Canada compared say to
3 Mexico -- they have very low wages. The wage in Canada
4 is one-tenth (1/10) of what we pay in Canada. They could
5 be still cheaper if I don't have my production ten (10)
6 times more productive than they are. Suppose I'm only
7 eight (8) times more productive. The unit cost will be
8 higher in Canada than it would be in Mexico.

9 What we have in -- in Canada is a
10 situation where our labour costs are almost equivalent --
11 actually we still have a margin in our favour, actually
12 we have a bit higher, but our productivity is 20 percent
13 lower. And this productivity gap we have been trying to
14 deal with and has not been re -- it has been so resilient
15 and so insensitive to evening things.

16 Some people say, well, because of our
17 geography, all right. Other people say because we watch
18 more hockey than others. Just joking. Okay, but the
19 story is is that we have a discount of 20 percent on
20 productivity. And many times we have used what is now
21 known as the lazy dollar hypothesis in Canada. Any time
22 our costs in Canada were higher than United States all we
23 really had to do to equalize costs or give us a bit of an
24 advantage, we had to depreciate our dollar. Once we
25 depreciate the dollar we could really equalize it.

1 Over the long term my argument is the
2 Canada dollar is at disadvantage. It cannot continue to
3 be above the American dollar, that what we really have is
4 a situation where the American dollar is weak because of
5 some of this quantitative easing things. Over the long-
6 term, the Canadian dollar cannot unless we change our
7 productive system. And the -- the fact that we short
8 production runs, we have worse weather conditions, I
9 mean, there are so many other things. But the story is
10 the Canadian dollar cannot, in the long run, given all
11 the circumstances I'm talking about, maintain a level
12 that would be at a level higher than the US.

13 All the forces would be stacked towards
14 really bringing it down. Now, this would be, in some
15 sense, favourable to us, although, I mean, this -- the
16 arguments that's always been, No, it's -- when one (1)
17 side goes up, it goes down, it's equivalent. No. If you
18 really look at the calculations, it's always favourable
19 for us to have a discounted -- to have a depreciated
20 dollar, if not directly, indirectly because the
21 depreciated dollar would really put tremendous amount of
22 growth in our economy and indirectly all these MIPUGs
23 would really be healthy and strong and would have a
24 greater demand and would really translate one way or the
25 other into our favour.

1 So in -- in that respect, where do we
2 stay? I would say in the medium term. And I don't think
3 my -- my colleague may be agreeing with me here, that's
4 it's going to be on the favourable side. I cannot, for
5 the life of me, for any circumstances or under any
6 conditions, say that this picture is going to be rosy
7 down the road. But the -- the medium term is going to be
8 a bit better than it is, but it's going to be mixed.
9 Mixed in the sense that with the growth of the economy,
10 with the depreciation of the Canadian dollar, we're going
11 to get some changes in the interest rate, some changes in
12 the inflation, and some changes in the escalation of --
13 of our costs.

14 And in the absence of any greater and
15 stronger concern for the environment, and in the absence
16 of any predictable and some confidence that the natural
17 price -- the natural gas price is going to change, the
18 story remains a mixed one.

19 MR. GAVIN WOOD: But, as I understand it
20 in the answer at page 65, you -- you say, overall, tilted
21 towards the prevalence of favourable factors.

22 DR. ATIF KUBURSI: As I said, only in the
23 medium term. All right, but cannot voucher (sic) for
24 more than that.

25 MR. GAVIN WOOD: But -- but can I press

1 you a little on that. When you say the medium term, I
2 mean, given the -- the capital expansion that's -- that's
3 being proposed --

4 DR. ATIF KUBURSI: Yeah.

5 MR. GAVIN WOOD: -- is -- is that the
6 medium term?

7 DR. ATIF KUBURSI: No. See, the capital
8 is long-term, and medium term is only suggesting that we
9 go slowly, we move into these things, see and corroborate
10 that this tilted -- this tilt is real. You can't for --
11 you know, make a long-term judgment and situation on the
12 basis of short or medium-term conditions.

13 All would this argue is it would really be
14 any of adv -- to your advantage, in your favour if you
15 wait and confirm these things, but mostly confirm, and
16 you have this strong really medium term, this is a
17 stronger argument that maybe things will begin to be
18 anchored on a more optimistic, rosier picture that will
19 allow you to go into an investment of the sort and the
20 scale that we're talking about.

21 MR. GAVIN WOOD: Okay. Then finally,
22 given the costs that the -- the Board has heard, that
23 Manitoba Hydro's in -- incurring on a monthly basis in
24 terms of potentially going forward with the -- the
25 capital expansions, would -- would you be encouraging the

1 Board to accept thou -- those costs, but no final
2 decisions be made for the time being?

3 DR. ATIF KUBURSI: I'm sure the Board
4 recognizes that it's not one (1) side of the ledger that
5 counts. There's no question about that the costs are
6 rising, but the cost is not the only side of the
7 equation. There are things you have to take into
8 account. You also have to take into account the
9 revenues, the expected revenues.

10 The issue is about net revenue. And it's
11 not the net revenue now, but over a long period of time.
12 And it's not over a long period of time, but in terms of
13 net present value. So all these calculations have to be
14 done and done, as I said, in -- in -- in some very hard-
15 nose and verifiable calculations.

16 But -- but you cannot be fixated only on
17 the costs. I mean, you've got to look at the revenue
18 side too. So it's two (2) sides to a ledger and it has
19 to be taken into account.

20 MR. GAVIN WOOD: I intend, Mr. Chair, to
21 move on from Question 1. Did -- did the Board have any
22 questions to raise on that matter?

23 THE CHAIRPERSON: Not at this time.

24 MR. GAVIN WOOD: Thank you, sir.

25

1 CONTINUED BY MR. GAVIN WOOD:

2 MR. GAVIN WOOD: Dr. Magee, turning to
3 Question 2, at page 65, the answer is set out there.
4 Would -- do you care to elaborate on it or emphasize it
5 at all?

6 DR. LONNIE MAGEE: Yes. The -- the
7 question has to do with a view to the adequacy of Hydro's
8 current forecast domestic rates given the uncertainties
9 of -- involved about the capital asset costs and plans
10 that I think were -- Atif already talked about.

11 I just had a couple of things to note.
12 One (1) is going back to the -- the diagram, the -- the
13 four (4) box diagram on -- on page 63, the -- there is
14 some huge risk involved, but I think from our point of
15 view there's risk -- it's -- it's unavoidable risk,
16 regardless whether you expand or don't expand. There's
17 risks either way.

18 And it might seem like you're taking on
19 more risk by expanding because in the top-right box you
20 see it could turn out not favourable, major losses,
21 there's -- there would be these white elephants, these
22 symbols of some sort of gamble that didn't work out,
23 let's say.

24 But on the bottom left, that's an equally
25 -- equally risky in -- in -- in the sense that if you

1 don't expand, sure you could expand later, but if you
2 don't expand, hydro prices go up, there's -- could be
3 even be more money involved in the lower-left box being
4 lost than in the upper-right box. You could be losing --
5 Manitoba citizens could be losing a fortune. It -- the
6 difference is that there would be no sort of symbol of
7 the mistake. There would be no 'thing' sitting there
8 that people could say, Well, that was wrong. It would
9 just be money -- a lost -- a huge lost opportunity
10 without a convenient symbol to -- to point at.

11 So I think it's -- it's helpful to -- it
12 could be helpful to keep in mind that there's no way out
13 of this -- of avoiding this risk. Either way, there's a
14 big risk.

15 Then the -- the second point is that -- to
16 do with the -- the rates. It's -- I think it might be
17 tempting to think that increasing rates now, if -- if you
18 kind of get drawn into the analogy of, say, buying a
19 house and it's better to have a bigger down payment now,
20 then you don't have to pay as much now, you could argue,
21 well, boosting the rates a little bit now means you don't
22 have to borrow as much, you won't have to pay as much
23 off.

24 But -- and -- and there's some truth to
25 that, of course, but I just want to mention that when you

1 boost rates, unlike when you're buying a house, you're
2 boosting rates by -- by taking money from -- or not
3 taking, but asking for a higher price from citizens and -
4 - and power users who -- some of that money would have
5 also been invested by them for other things.

6 So it's not just a matter of taking money
7 that would have been spent on vacations or whatever and
8 putting it into this, you're taking money that -- some of
9 which would have been spent by, you know, private sector
10 investment or by, you know, improved diets for kids or
11 whatever, you know. You have to take into account that
12 there is some also long-term cost from the other sectors
13 of the economy by boosting rates. So it's not just a
14 matter of investment versus consumption in the rate
15 decision.

16 MR. GAVIN WOOD: Thank you. Going on to
17 Question 3 and Question 4, again, this -- the same -- the
18 same issues, sir. Do you have anything to add to the
19 answers that are set forth under those two (2)?

20 DR. LONNIE MAGEE: Well, for Question 3,
21 this -- this has to do with what Atif was saying about
22 staggering or -- well, actually, about the other side of
23 it -- I was incorrect there -- about thinking about the
24 timing of the investment decision.

25 So just, again, not providing a specific

1 answer, but just a way to think about it. The -- the
2 tradeoff is the -- the cost of waiting is the -- the
3 foregone revenues from -- that you could have gotten from
4 getting things set up sooner. And you need to balance
5 those with the -- the gain that every -- as time goes by,
6 we learn something more that helps us to predict what the
7 next few decades are going to be like, even the
8 information that has come in since the -- the hearings
9 began, for example.

10 So but, you know, that doesn't mean we
11 should necessarily wait. Maybe you wait and you don't
12 find out anything, and you just end up foregoing the --
13 the revenues you could have had. But there -- there
14 needs to be, I think, some -- and it wouldn't be a
15 statistical analysis, but kind of informal consideration,
16 about what are we likely to find out over the next few
17 years that could help us make a better decision. Is it
18 worth waiting versus worth going ahead?

19 And -- and so that's, you know, a very
20 kind of a fuzzy situation, but that's how I see it as the
21 -- the main issued involved there.

22 MR. GAVIN WOOD: And anything further on
23 4, sir?

24 DR. LONNIE MAGEE: Well, yeah. I wrote
25 something in there about -- it was kind of off the top of

1 my head. I'm not -- I -- I don't really pretend to know
2 what -- what markets would prefer, but it seems to me
3 that people in markets would be smart enough to know
4 that, you know, this is an industry where, as Atif used
5 the word "lumpy," everyone would understand that. It
6 wouldn't be in any sense a kind of irresponsible decision
7 because it -- it's a tough decision to make about
8 expansion. But there's only one (1) way to do it, which
9 is this huge, lumpy expenditure.

10 MR. GAVIN WOOD: And, finally, Dr.
11 Kubursi, on the last one (1) I think that we intended to
12 have you comment on is -- is number 5. Could I ask you
13 to -- to reference that, please?

14 DR. ATIF KUBURSI: Yes. Well, I mean,
15 it's a nice way to conclude if -- in -- in the sense that
16 droughts are definitely, especially consecutive years,
17 are going to be a major risk that you have to contend
18 with. But it's not the only risk. And even drought can
19 be dealt with, in -- in some sense could be mitigated.
20 There are many ways in which our report and other
21 consultants have come up. And Manitoba Hydro has an
22 evolving system to deal with it.

23 The two (2) other types that are equally
24 important, and we've already discussed them here, but let
25 me re-emphasize them, the long-term contracts and the --

1 the huge investment that you're undertaking. And this --
2 probably long-term investments -- sorry, long-term
3 contracts you can deal with in terms of many adjustments,
4 in terms of what price you would really -- what
5 escalations, what curtailments, what terms and these
6 things. The long-term investments, in my view, probably
7 will remain as the major most critical risk factor to
8 face.

9 And on -- on these, one (1) of the best
10 economists is now, you know, most often is recognized,
11 and his name is used in -- in vain. John Maynard Keynes
12 says, in the final analysis, what prevails is the animal
13 spirit. When it comes to investment, you could go with
14 the most secure and most precise calculations, and the
15 final analysis is what the animal spirit do. Those in
16 the market who take the risk will get the gain, and those
17 who run away from it will be punished.

18 MR. GAVIN WOOD: Ge -- gentlemen, topic
19 16 we feel has -- has already been covered in the direct
20 examination, so that's to be simply noted for your
21 interest. And with that, that would then con -- conclude
22 the direct. And I thank both -- both doctors for their
23 answers and their patience with me.

24 THE CHAIRPERSON: Well, thank you to all
25 of you. And when we come back Board counsel will begin

1 the cross-examination for the Board. So we're thinking
2 we've got a lot to absorb even from yesterday and this
3 morning, so we're going to come back at 1:15. Thank you.

4

5 --- Upon recessing at 11:58 a.m.

6 --- Upon resuming at 1:21 p.m.

7

8 THE CHAIRPERSON: Okay. Welcome back.

9 Ms. Southall?

10 MS. ANITA SOUTHALL: Thank you, Mr.

11 Chairman.

12

13 CROSS-EXAMINATION BY MS. ANITA SOUTHALL:

14 MS. ANITA SOUTHALL: And just a -- two
15 (2) preliminary comments, or perhaps three (3). Doctors
16 Kubursi and Magee, I will refer to you by your names. If
17 I don't I -- and I refer to you as doctors KM, for the
18 record and -- and for yourselves, I mean no disrespect.
19 But if I refer to you that way, in -- in shorthand I -- I
20 hope you know I'm speaking to you. I'll certainly be
21 looking at you when I -- when I say it.

22 Secondly, I don't think I'm entirely ready
23 for the exam, professors, but, you know, I'm going to do
24 my best and I -- I hope you mark on some sort of
25 probability curve.

1 MR. GAVIN WOOD: Don't listen to that one
2 (1).

3 MS. ANITA SOUTHALL: And -- and thirdly -
4 - actually, I'm going to -- I'm -- I'm changing that.
5 I'm going to say I've got four (4) comments. Thirdly,
6 I'm going to ask you please to listen carefully to my
7 question and only respond to my question. I'm saying
8 that because I may have a series of questions that
9 address the particular issue and you -- you don't need to
10 necessarily cover the whole waterfront, or allocate fifty
11 (50) minutes to the particular response to an individual
12 question. And -- and I'm -- you know, I'm -- I'm serious
13 when I say please just -- just listen to the question and
14 respond to the question because I need to be able to
15 leave time for other parties to conduct their cross-
16 examination.

17 And my last introductory comment is that
18 whenever I'm posing a question, if you believe that it's
19 calling for the revelation of confidential information
20 that Manitoba Hydro has asked you to keep confidential, I
21 want to assure you I am not seeking that. So please, if
22 you need to pause, even if I'm asking something that you
23 believe would require that, you can either consult with
24 your counsel or indicate that you're not able to answer
25 that question without use of that information. So, is

1 that clear? Is that all right? Thank you. You're
2 indicating, yes, I see.

3 Can I please turn, though -- before I go
4 to where I started in my preparations for this cross-
5 examination, I just want to turn to a few matters that
6 you were addressing laterally this morning. And first,
7 Dr. Kubursi, I believe it was yourself who was discussing
8 the work associated with Table 6.2 at page 229 of your
9 report. And the ideas -- you've located that, sir?

10 The -- the ideas -- or pardon me, the idea
11 of the combination of adverse effects, you made a
12 statement and I -- I'm not entirely sure if you finished
13 the thought, and if you did I missed it, so I'm going to
14 ask this question. You made the statement and my
15 paraphrase is, We don't know what the probability is of
16 these two (2) joint things, meaning, I believe, a drought
17 and high prices, so we use the Monte Carlo and ran it a
18 thousand (1,000) times to assess the quantitative impact
19 and what would happen at the mean value.

20 I myself possibly missed what the outcome
21 of that exercise was, so I'd just li -- like to ask you
22 to respond to that. What was the outcome of that Monte
23 Carlo analysis?

24 DR. ATIF KUBURSI: Okay. I -- let me
25 take the first part of the question. The first part of

1 the question we said we did not know the joint
2 probability. In the sense that these are two (2) events
3 happening at the same time. There are several
4 possibilities. One (1) typical possibility is to assume
5 that these two (2) events are independent. If they were,
6 then the joint probability would be simply the
7 multiplication of one (1) times the other, but we don't
8 know this. And we don't even know with what value these
9 probabilities are likely to come together.

10 There's a complicated formula. And when
11 you know exactly what the correlation is, you know, the
12 way they're associated, we said in this situation we're
13 not going to assign probabilities to these separate
14 events and look at the joint probability. We said we're
15 going to be probing all the possible way these
16 combinations come together.

17 And in such circumstances, it's a standard
18 understanding in the literature and in the practice or
19 risk management, is you will use a Monte -- Monte Carlo
20 simulation, where you look at these event happening at
21 the same time, and you run it a number of times. I mean,
22 you could run it a hundred, five hundred (500), a
23 thousand, five thousand (5,000) and more.

24 What you're trying to do is to map all the
25 possible combination that may arise from this, and that's

1 precisely what we've done. We looked at these variables,
2 and each one has its own probability distribution. We
3 combined them, then ran the impact on net revenue in
4 combination, allowing all these possible interactions to
5 come, and we looked at the mean that would -- the average
6 that would come. That's what we did.

7 MS. ANITA SOUTHALL: And -- and so was
8 there a result that derived from that?

9 DR. ATIF KUBURSI: Yeah. This is the
10 result that you see in Table 6.2, the fourth line.

11 MS. ANITA SOUTHALL: And so -- and if I'm
12 stating this incorrectly or summarizing it incorrectly,
13 please correct me. So the fourth line being drought 1940
14 flows/high import prices, where the impact on net revenue
15 without interest costs is \$755 million loss, and then the
16 net impact against the base case of one billion two
17 hundred million dollars (\$1,200,000,000). Is that the
18 line you were referring to?

19 DR. ATIF KUBURSI: Yeah, precisely.

20 DR. LONNIE MAGEE: Can -- can I add just
21 something briefly? The --

22 MS. ANITA SOUTHALL: Yes, please.

23 DR. LONNIE MAGEE: The simulations that
24 Atif's referring to are -- in each replication or each
25 one of them, those two (2) values that -- that -- in --

1 in that line 4, those two (2) values, the drought and the
2 export price numbers are the same every time, and what
3 changes are all the other random numbers.

4 So what -- what you're looking at there is
5 what would happen if all the other things changed around,
6 letting them change, but what if in the special case,
7 where those two (2) things were -- we knew that they were
8 at those two (2) numbers, what would the average outcome
9 be. So the averaging is -- is with respect to all the
10 other random va -- variables.

11 MS. ANITA SOUTHALL: Thank you. Could
12 you comment, and, again, either one of Drs. Kubursi or
13 Magee, on the question: Is the use of a Monte Carlo
14 simulation of combining the 1940 drought with high import
15 prices a good substitute for doing a joint probability?

16 DR. LONNIE MAGEE: It -- it's a different
17 exercise. It would be really great to know both, but --
18 and in order to do our exercise, there is implicitly some
19 joint probability built in there because we have to
20 specify probabilities for everything.

21 But because that particular one is
22 concerning the edges of two (2) of the dis -- of the
23 variables on uncommon occurrences, they don't happen
24 often enough to get a very accurate estimate of the
25 probability. So we're -- we're not comfortable using the

1 simulation to make statements about the probability that
2 this happens, but we're illustrating how the two (2)
3 variables interact with each other by seeing what would
4 the average result be if this happened, without saying --
5 trying to say how often it happens.

6 MS. ANITA SOUTHALL: This might be an
7 over-simplistic way to characterize your finding on this
8 point, but is it fair to say that the -- the combination,
9 based -- based on your analysis, the combination of a
10 drought at the level of 1940 with high import prices is a
11 very unlikely scenario but could -- could actually
12 happen?

13 DR. LONNIE MAGEE: Yes, we believe it --
14 it could happen. It's -- but we're -- we're not trying
15 to pin down a probability.

16

17 (BRIEF PAUSE)

18

19 MS. ANITA SOUTHALL: Dr. Magee, then --
20 this may be your question, but of course either of the
21 doctors, please respond. And I -- and I think we'd be
22 looking at, if I'm correct, Figure 6.1, which is on the
23 prior page of your report, page 228 of the KM Report.
24 There was talk of the -- the -- and I'm sorry, I don't
25 know how to describe it, but the scenario being way out

1 in the tail of the distribution, and that it represents a
2 low probability. Is that correct? Have I described it
3 properly?

4 DR. LONNIE MAGEE: Of the scenario in
5 line 4?

6 MS. ANITA SOUTHALL: Yes.

7 DR. LONNIE MAGEE: Yeah. Yeah, but --
8 well, linking it to Figure 6.1, Figure 6.1 you can think
9 of as summarizing the net revenues if we let all of the
10 random -- all of the variables be random: the water
11 flows, the net exports, everything. So suppose we're
12 predicting eighty (80) years ahead. We don't know
13 anything about any of these numbers. Let them all be
14 random, but assume the world was still kind of the way it
15 is in -- in the model, this is the set of results we --
16 we could expect to see in that case.

17 So -- but the situation changes a lot if
18 you know that you're in a drought and with high import
19 prices, and to -- to ask the question, How would it
20 change, doesn't require saying how likely it is it would
21 change. It's -- it obviously would -- would be -- is
22 important to think about that second question, How likely
23 is it. But that's not what we're trying to do right in
24 this specific table; we're just saying what would happen
25 if.

1 DR. ATIF KUBURSI: If I can add one (1)
2 thing, just about what this graph represents, we can say
3 easily that if all these variables other than the amount
4 of water were changing randomly, there is a chance here,
5 that -- a 95 percent probability that it would be higher
6 than a hundred ninety-nine (199), all right? And if 5
7 percent, being less than six hundred fifteen (615). So
8 you could see that it would map all the possible values
9 of net revenue that could arise from keeping that fixed
10 number on water and everything else changes.

11

12 (BRIEF PAUSE)

13

14 MS. ANITA SOUTHALL: And, Doctors, if you
15 did do a joint probability analysis between the 1940
16 drought levels and high import prices, and then you
17 applied the Monte Carlo analysis to that, how might that
18 change the cost implications of a drought or the -- the
19 analysis that you would derive from that particular
20 sequence of steps.

21 DR. ATIF KUBURSI: Counsel, let -- let me
22 ask you, I mean, what we really did here is that we fixed
23 the amount of water at its minimum level, the price of
24 imports at its high level, and we looked at the -- how
25 the net revenues would change, allowing all other

1 variables to change and simulating this thousands of
2 times and looked at the cumulative distributions the way
3 you see it in these pictures. That's exactly what they
4 did. And this would be Figure 6 point -- it would be 6
5 point -- yeah, 6.4 is it? Yeah, 6.4.

6

7

(BRIEF PAUSE)

8

9 DR. ATIF KUBURSI: And as you can see in
10 -- in this table, Counsel, the mean value is minus seven
11 five four (754)/seven five five (755) and we said there
12 is a 5 percent chance it would be less than 1.3 billion
13 and 95 percent that it would be less than the -- what is
14 it, 474 million.

15

16

(BRIEF PAUSE)

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DR. LONNIE MAGEE: Can -- can I add
something to that? If -- if -- if there was a -- a
different specification of the joint distribution it
would change a lot of things, but there's -- if -- if you
went just part way and took into account the joint
distribution of the export prices and the -- and the
water flow or the drought, and left everything else the
same, then that wouldn't affect line 4 of the -- of that

1 table, 6.2, at all, because it's treating -- looking at
2 the special case where we know what those values are.

3 But it would affect Figure 6.1, because --
4 which is the kind of overall what if we don't know
5 anything case, because, for example, if you built into
6 6.1, if you thought there was a hi -- relatively high
7 likelihood that both things would happen together, that
8 would make that pessimistic scenario more likely and it
9 would make more numbers go off in the left tail in the
10 simulation.

11 Then -- and then alternatively, if it was
12 the other way around, if you thought it was unlikely
13 they'd both happen at the same time, even less than if
14 they were independent, it would make the numbers -- it
15 would make it less likely of having that -- those very
16 small numbers.

17

18 (BRIEF PAUSE)

19

20 MS. ANITA SOUTHALL: And -- and, Dr.
21 Magee, just a -- another point of clarification, which I
22 think you -- you testified to earlier today, at Table
23 6.2, sir, on page 229, you referenced, I believe, line 2
24 in that table, which is drought 1940 flows and the impact
25 on net revenue without interest costs, and then the net

1 impact against the base case. There prices were allowed
2 to be variable I -- as I recall it. Is that correct?

3 DR. LONNIE MAGEE: Yes.

4 MS. ANITA SOUTHALL: So with a full range
5 of electricity prices, but looking at the low flows
6 against the base case, that's the -- that's the finding
7 in line 2, correct?

8 DR. LONNIE MAGEE: That's right. That's
9 the average of -- of all the different possible outcomes
10 from the simulation.

11 MS. ANITA SOUTHALL: Doctors Kubursi and
12 Magee, without disclosing confidential data, could you
13 prepare a cost drought estimate utilizing Manitoba Hydro
14 data?

15 DR. ATIF KUBURSI: It -- it would be
16 difficult without possibly infringing on the
17 confidentiality because you worry that lots of people who
18 could be privy to different valuations and the technique.
19 We -- the last thing we wanted is that we give anybody
20 the chance to work backward to the price set that we were
21 using.

22 Now, we admit it would be difficult, but
23 there is always a possibility that always smart people
24 are there who have interest in divulging these things.
25 And our worry is that we didn't want to be in any remote

1 chance of this happening.

2

3

(BRIEF PAUSE)

4

5 MS. ANITA SOUTHALL: Thank you. I'm --
6 I'm now going to turn back to effectively the start of
7 your testimony, I suppose not coincidentally, the start
8 of your original report. I believe you've confirmed that
9 in completing the report you -- you intended to and, in
10 your view, with some of the perhaps limitations that you
11 testified to this morning, believe that you covered the
12 terms of reference set out in Order 30/'10.

13 Is that correct?

14 DR. ATIF KUBURSI: More or less. Well,
15 we thought -- we thought we did. I mean, there -- as --
16 as we -- we discussed, the terms of reference were very
17 broad. And we wanted to do the best job we could given
18 our expertise and our limitations.

19 MS. ANITA SOUTHALL: Thank you for that -
20 - that further explanation. In your testimony and, of
21 course, in your report, and certainly in your direct
22 evidence, you outlined the nature of the information and
23 access to individuals within Manitoba Hydro that -- that
24 you availed yourself of. Do you recall that?

25 DR. ATIF KUBURSI: Yes.

1 MS. ANITA SOUTHALL: Were you, as a team,
2 provided full access to the models incorporated by
3 Manitoba Hydro, and I'm going to limit that by saying
4 including an ability to review the structure and the
5 major assumptions of the models?

6 DR. ATIF KUBURSI: We -- we saw
7 demonstrations. We saw documentation of the models. And
8 we saw actually of HERMES several of these. And we saw
9 the mathematical structure in publications that Mr.
10 Cormie and others have published. I would say on HERMES
11 we were absolutely convinced that we had a good and
12 thorough understanding, and so the actual numbers -- and
13 so Mr. Gawne running it. We didn't have this same thing
14 for SPLASH in the beginning, when this was rectified
15 later on.

16 MS. ANITA SOUTHALL: And just apropos
17 your comment, Dr. Kubursi, I'm sorry, I -- I don't know
18 the individual's name, but that you -- the person you
19 just referenced. Was that the model operator for HERMES?

20 DR. ATIF KUBURSI: Yeah, he's -- he's the
21 person who was basically running the models when we were
22 meeting with Manitoba Hydro. If you prefer not to
23 mention names, I...

24 MS. ANITA SOUTHALL: No, I -- I just
25 wasn't familiar with that name. So was the model

1 operator able to verify or answer any questions for you
2 in terms of inputs or any questions you had associated
3 with accuracy?

4 DR. ATIF KUBURSI: Absolutely.

5 MS. ANITA SOUTHALL: If I could just ask
6 you to turn to page 11 of -- and this would be 11 of your
7 direct evidence, so I believe that KM Exhibit 4.

8 MR. GAVIN WOOD: He has it now.

9

10 CONTINUED BY MS. ANITA SOUTHALL:

11 MS. ANITA SOUTHALL: And here I just want
12 to review -- Drs. Kubursi and Magee, I want to review the
13 subject matter of the redactions that were made to your
14 report. Do you see that on page 11? Nodding yes.

15 DR. ATIF KUBURSI: Yeah. Sorry, yes.

16 MS. ANITA SOUTHALL: I -- I note that --
17 I'm -- I'm actually just going to list them, and then
18 afterwards, because I think it's obvious there, but for
19 the record, the -- the nature of the categories of
20 material that contained redactions in the report,
21 including included pricing information from foreign
22 contracts, pricing premiums with respect to peak-period
23 demand, information on factors which have affected long-
24 term export negotiations, also factors in export
25 contracts which result in price escalations, and

1 curtailment condition provisions under long-term
2 contracts, also uncontrolled water flow data. I believe
3 those are the -- and perhaps international forecasters'
4 predictions or forecast information.

5 Would that constitute the nature of what
6 the redactions were in the report vis-a-vis confidential
7 information?

8 DR. ATIF KUBURSI: Yes.

9 MS. ANITA SOUTHALL: I take it, then,
10 that pricing information was provided in confidence, is
11 that right?

12 DR. ATIF KUBURSI: Yes, that's correct.

13 MS. ANITA SOUTHALL: Did -- did I hear
14 the testimony that your review of the contracts included
15 review of one (1) term sheet, or did you review all the
16 term sheets that are pending?

17 DR. ATIF KUBURSI: We reviewed all the
18 term sheets, but one (1) contract in detail.

19 MS. ANITA SOUTHALL: And were you
20 provided with access to market information that was being
21 used in the HERMES model? Did you have access to that
22 specific data?

23 DR. ATIF KUBURSI: Counsel, if you would
24 maybe explain what you mean by market information here.

25 MS. ANITA SOUTHALL: Price forecasts.

1 DR. ATIF KUBURSI: We -- we -- we saw the
2 price forecast, and we had an idea from where -- they
3 told us from where they're getting these price data. No,
4 we -- we did not have the actual prices, but we saw where
5 the prices are coming from in the model and from where
6 they were obtained. We had queried about, Where do you
7 get these prices, and we were told.

8 MS. ANITA SOUTHALL: Were you provided
9 with the price forecasts?

10 DR. ATIF KUBURSI: We didn't ask for it.

11 MS. ANITA SOUTHALL: Could you elaborate
12 in broad terms on the meetings that you had with Mr.
13 Cormie and the nature of the discussions you had with
14 him?

15 DR. ATIF KUBURSI: How much time do you
16 have?

17 MS. ANITA SOUTHALL: I'm asking for a
18 high-level description, please.

19 DR. ATIF KUBURSI: Okay, because honestly
20 we -- we -- we met several times with Mr. Cormie. First
21 --

22 MR. GAVIN WOOD: Many times.

23 DR. ATIF KUBURSI: Many times. I mean,
24 the first time was in February when I came, and there we
25 discussed the power sale and exports and the structure of

1 the operations of resource planning and the way it's
2 prepared, resource plan. Then we went with Mr. Cormie
3 and we saw the various models and how they're structured
4 and how they're used, and went into details about how
5 these models are constructed, used, and who does what.
6 And we saw some of the nitty-gritty of these models.

7 Then we came in April 25 to 29 with
8 Lonnie, and we went through the same exercise. We began
9 with Mr. Cormie and -- and with Mr. Adams, then we went
10 through the different models. We went with the group
11 that runs SPLASH, then we went with HERMES, and then we
12 went with PRISM. I mean, we went through the details of
13 these.

14 Then we came again and we met with Mr.
15 Cormie as he was making the presentations during the
16 conference that was open to the people.

17 Then Mr. Cormie came and visit with us in
18 Burlington in August. And -- yeah, it's August 30th,
19 exactly, and we discussed the contracts and the nature of
20 the strategies used by Manitoba Hydro in its construction
21 of prices and the logic of the curtailment and the
22 negotiation strategies. So in many respects, probably
23 Mr. Cormie was the person we met most with.

24 MS. ANITA SOUTHALL: Doctors, was there
25 any additional data or information provided to you which

1 was subject to confidentiality that is not in some way
2 addressed in your report or presentation? In other
3 words, did you have access to any information which you
4 either considered to be irrelevant or for whatever reason
5 was not addressed in your report in any fashion? I -- in
6 terms of subject matter?

7 DR. ATIF KUBURSI: Probably, I mean, if I
8 can think of anything is that we were into the trading
9 room, we saw the trading operations, we saw the way
10 things are reported, so there were elements that we
11 didn't talk about that refer to some trading mechanics
12 and information, and the way these curves are used and
13 the way it's -- you relate to the control room and the
14 way -- the web trader. So there were things that we saw,
15 but we couldn't comment on everything.

16 MS. ANITA SOUTHALL: Could you please
17 explain the extent of your review of the risk-governance
18 procedures at Manitoba Hydro as part of your research
19 work for the report.

20 And as part of that question, who provided
21 the information to Manitoba Hydro regarding risk-
22 governance procedures?

23 DR. ATIF KUBURSI: As you appreciate, we
24 met with the front office, but we also met with the
25 middle office. With -- we met with Mr. Deviaene and Ms.

1 Hoskins (phonetic). We met with Mr. Warden several times
2 too and discussed the -- the structure and limitations
3 and evolve -- the evolving structure. We also had
4 meetings with different groups that are part of the
5 export power and marketing group, which is the risk --
6 the export power risk group.

7 So in many respects we were given open
8 access, and again, we met several times with the -- the
9 risk -- the -- the -- the group that are in the office of
10 the vice-president and called the Corporate Risk
11 Management Group, I suppose.

12 The -- the one (1) that produced the CPR -
13 - the Corporate Risk Management Report.

14 DR. LONNIE MAGEE: Just about -- briefly
15 about one (1) of the names. I think -- I think it was
16 Denise Hickson --

17 DR. ATIF KUBURSI: Yeah. Yeah.

18 DR. LONNIE MAGEE: -- that we met, yeah,
19 rather than Hoskins.

20 DR. ATIF KUBURSI: Not Hoskin, Hickson.
21 Yeah. Yeah.

22 MS. ANITA SOUTHALL: And I take it you
23 were satisfied or had -- in fact, maybe the better
24 question is, how did you verify that the information you
25 were provided with respect to risk-governance procedures

1 was accurate?

2 DR. ATIF KUBURSI: I mean, what we were
3 looking at is to see the structure. To see where this
4 group sits within the total organization. We also wanted
5 to see the level of involvement. We want to see how far
6 and to the extent to which they're involved in, say,
7 long-term contracts. We want to see to what extent some
8 of the question that had been raised by KPMG or ICF or
9 NYC were being followed.

10 So we -- we had a number of questions.
11 Actually, sometimes I think we were probably
12 overextending our limit by very thorough questioning and
13 asking for details of where things go and who is
14 responsible for what and what are the procedures, what
15 are the policies.

16 MS. ANITA SOUTHALL: Thank you. And --
17 and perhaps it was all part of the same process. I
18 expect it might have been, Drs. Kubursi and Magee. But I
19 have the same question for you on the risk-management
20 processes in place at Manitoba Hydro.

21 Would it have been the same group of
22 people and did you follow that same process in terms of
23 questioning to determine what the status of the risk-
24 management processes are at the Utility?

25 DR. ATIF KUBURSI: Yes, and -- and, as

1 you know, we had a number of questions ourselves. And we
2 had tendered, as you can see in chapter 2 and in chapter
3 7, a number of recommendations as to what we would like
4 to see. I mean, we went to the skill set that people
5 have, and felt that maybe statisticians, actuarial
6 people, should probably be there.

7 We wanted a number of ways in which
8 activities have to be redefined. We wanted also, as I
9 mentioned in the direct, that we would like to know
10 people -- persons who would be responsible and whose
11 terms of reference would be to oversee and to report and
12 to evaluate risks.

13 We -- we tried as much as possible to
14 follow the three (3) major groups. I mean, we met maybe
15 informally with members, but not with the group itself,
16 like the Program Review Committee, the -- the Export
17 Power Risk Committee. The -- I mean -- I mean, these are
18 senior staff that we met on an individual basis. We did
19 not meet them as sitting in a group as they meet on these
20 things.

21 But we also took notice of the questions
22 that have been raised by KPMG, ICF, Dr. Bhattacharyya,
23 Deloitte, the -- the whole works. I mean, we tried to
24 see all these questions and see if we can find answers
25 to.

1 MS. ANITA SOUTHALL: In terms of the
2 middle office, were there staff in the middle office
3 beyond the two (2) individuals that you met with, or did
4 that constitute the middle office when you were
5 conducting your review work?

6 DR. ATIF KUBURSI: I -- I'm sure they --
7 they were the -- the higher levels of the staff. I'm
8 sure they must have support staff. But we were of the
9 opinion that we would like to see more staff in this
10 committee.

11 MS. ANITA SOUTHALL: I just have a couple
12 of questions arising out of the concept of information
13 asymmetry. You remember discussing that, I believe,
14 yesterday, Doctors Kubursi and Magee. Would the
15 information provided about the cost changes of Bipole 3
16 in this hearing process be an example of information
17 asymmetry between the principal and agent?

18 DR. ATIF KUBURSI: As I mentioned in the
19 direct, information asymmetry is typical of any
20 corporation, and particularly so of large corporations.
21 And it's in the nature of the beast, so to speak, that
22 the boards or regulators and others would not have the
23 same information or are not privy to the information that
24 is generated, and that the functions of both would be
25 enhanced if there were more and rich exchange of views.

1 No question about it, if there is a piece
2 of information that is so critical to a decision or to an
3 evaluation, that one (1) party that is involved in that
4 decision or evaluation does not have access to, it would
5 create and raise a question about information asymmetry.

6 MS. ANITA SOUTHALL: I'm not sure if this
7 is beyond the scope of what -- what your work entails, so
8 please say so if it does.

9 Are -- are you able to address how you
10 would foresee Manitoba Hydro and its stakeholders,
11 including this Board, overcoming this challenge, this
12 kind of information asymmetry challenge, to -- to try to
13 prevent those occurrences in future?

14

15 (BRIEF PAUSE)

16

17 DR. ATIF KUBURSI: Okay. Let me -- let
18 me speak a little bit about our experience. We were very
19 impressed with the openness of Hydro and -- and their
20 willingness to explain. We didn't feel at any time --
21 maybe minor times but, on the whole, we did not find that
22 they were in any way trying to hide or refrain from
23 explaining things.

24 But we're not in -- in any position that
25 we would take upon ourselves to say, We want you to

1 improve the relationship with the Board or the other
2 stakeholders, only to -- to basically and fundamentally
3 ascertain the principle that proper decisions, proper
4 evaluation, proper regulation would be that much more
5 efficient and smoother if information flow is encouraged
6 and made part of the tradition and the practice of the
7 organization and the Corporation.

8 There is a big difference between
9 confidential information and information. I mean, there
10 is no attempt on our part to profess to anybody about
11 what is confidential, what's not. I mean, they know
12 their trade secrets and the commercial value of certain
13 things, but there are other areas which would make the
14 process of rate setting and regulation that much more
15 profound and effective if the free flow of information is
16 enhanced and improved.

17 MS. ANITA SOUTHALL: Thank you. And I'm
18 now going to turn to another area that you discussed in
19 your testimony, and certainly in your report: This
20 concept of risk appetite of Manitoba Hydro versus
21 ratepayers, if I can put it that way, in simple terms.

22 My understanding, Doctors, is that you've
23 indicated in your report, and -- and I believe reiterated
24 in your testimony, that there could be a misalignment
25 between the risk tolerance and -- and risk exposure of

1 Manitoba Hydro and its ratepayers, is that correct?

2 DR. ATIF KUBURSI: That's correct.

3 MS. ANITA SOUTHALL: Mindful of your
4 closing comments today in your testimony when you
5 discussed the issues of expansion versus no expansion or
6 exports versus no exports and your analysis, if
7 ratepayers will prefer only to take on financial risk if
8 the probability of gain outweighs the probability of
9 loss, how would this impact how Manitoba Hydro operates
10 if it were required to align itself to tho -- to that
11 particular risk goal?

12 Again, not a whole class in terms of an
13 answer. I apologize, but, I mean, take -- take the time
14 you need. I'm only talking in jest.

15 DR. ATIF KUBURSI: Oh, that's all right.
16 Listen, I'm not easily repressed. The -- the issues here
17 are quite complex, and they operate at two (2) levels.

18 There's a level which we call theoretical
19 level. I mean, I went through -- this mathematician
20 Bernoulli was explaining actually to his cousin that
21 people have different risk aversions, and because they
22 have different utilities defined over wealth and income.
23 And this -- it automatically raises the question that
24 there is risk aversion of different degrees, and it would
25 be a surprise to Bernoulli and anybody that any two (2)

1 institutions, if not individuals, would have the same
2 aversion.

3 But, on average, corporations are
4 typically more risk takers than individuals, unless
5 they're risk plungers and big investors, but we're
6 talking about the average things. And in such
7 circumstances that the possibility of diversions is so
8 imminent and if a corporation is working on the behalf of
9 its shareholders, it should try to align its practices
10 and its appetite and its assessment of risk with a view
11 to matching that of their shareholders.

12 And here is something that we thought is a
13 little bit touchy in this situation, particularly because
14 the ratepayers will be the ultimate bearers of the
15 consequence of risk taking. Yes, we have retained
16 earnings as a cushion and we can fall back on this
17 retained earnings in case of difficulties and
18 consequences of risk taking.

19

20 (BRIEF PAUSE)

21

22 DR. ATIF KUBURSI: So the issue -- the
23 issue here is basically trying to see that you align the
24 interests, the assessments, the appetites of the
25 shareholders with that of management. And this is a

1 risk appetite that Manitoba Hydro displays in terms of
2 its proposed development plans? Is that -- are you able
3 to comment upon the nature of that in terms of where that
4 falls on a risk continuum, that kind of business plan?

5 DR. ATIF KUBURSI: I mean, it's a fair
6 question, but it's a -- asking too much. What I can only
7 say here is that when you look at such massive
8 investment, and this is the animal spirit I'm talking
9 about in the morning, which really translates -- instead
10 of using this crude animal spirit, is that they have a
11 much greater appetite for risk than the average risk
12 adverse person.

13 No question any investment of a magnitude
14 this sort over a long period of time would involve much
15 greater risk than probably what the people of Manitoba
16 would, unless they're going to be, and are certain that
17 they're going to ultimately benefit from the great
18 returns that such a risk taking would.

19 So it's an issue here of balancing risk
20 and returns. And one not to look at one (1) side without
21 the other, and to see if the population at large is
22 assessing the risk and returns and the tradeoffs between
23 the two (2) in exactly the same way as the Corporation.

24 MS. ANITA SOUTHALL: Doctors Kubursi and
25 Magee, you may be aware from review of transcripts or

1 information you've received through your counsel that
2 we've had testimony in this Hearing that Manitoba Hydro
3 has accumulated to date over \$400 million in expenditure
4 in the development of Keeyask.

5 Were you aware of that?

6 DR. ATIF KUBURSI: Yes.

7 MS. ANITA SOUTHALL: The term sheets
8 related to the generation that would be available through
9 Keeyask, if they're not converted into contracts, those
10 moneys may be stranded. I think you spoke of stranded
11 costs yourself.

12 Is that correct? If -- if those terms
13 sheets didn't come to fruition, those may be stranded
14 costs?

15 DR. ATIF KUBURSI: With one (1)
16 provision. The extent to which this expansion will be
17 used ultimately to meet domestic load.

18 MS. ANITA SOUTHALL: Can you comment on
19 whether or not it's prudent, in your view, to expend
20 these kinds of millions of dollars on the preferred
21 development plan ahead of having secure and contracted
22 new firm export arrangements at demonstrably profitable
23 terms?

24 DR. ATIF KUBURSI: I -- I mean, and I'll
25 let my colleague maybe speak for himself on -- on my

1 part. It would make more sense and it would be easier
2 and more comfortable for all parties if these large
3 investments can be allocated and part of it shared by
4 long-term contracts at prices above total fixed costs
5 that would basically carry part of the burden of these
6 things.

7 And this is my preference. I mean, some
8 people would argue, Well, these are go -- we're going to
9 use anyway because the domestic load is rising and these
10 things. But there is an element here. If you are
11 speeding up the process of development and if you are
12 making it contingent on your ability to sell more in the
13 export markets, I would like to be convinced that the
14 export markets would be generating sufficient net present
15 value that would contribute to this extra burden that the
16 people would have to assume in these investments.

17 MS. ANITA SOUTHALL: I apologize. I
18 should have done this earlier, but we have a reference
19 book of documents for this cross-examination. So if I
20 could just ask Mr. Singh to distribute the reference book
21 because I'll be turning to one (1) of the tabs now.
22 Thank you.

23

24

(BRIEF PAUSE)

25

1 THE CHAIRPERSON: Do we have an exhibit
2 number? Mr. Singh might be able to help.

3

4

5 (BRIEF PAUSE)

6

7 MS. ANITA SOUTHALL: This would be PUB
8 Exhibit 20.

9 THE CHAIRPERSON: Very good.

10

11 --- EXHIBIT NO. PUB-20: Reference book of documents

12

13 MS. PATTI RAMAGE: Excuse me. Ms.

14 Southall, is there any additional copies for...?

15 MS. ANITA SOUTHALL: I think all of my
16 copies are distributed, so.

17 THE CHAIRPERSON: Mr. Singh, if you could
18 arrange to have some more made then. How many more do we
19 need?

20 MS. PATTI RAMAGE: We can arrange for it.

21 It's just if there was some available, that would be --

22 we could follow along easier.

23 THE CHAIRPERSON: Do all the parties have
24 one? That sounds okay.

25

1 (BRIEF PAUSE)

2

3 THE CHAIRPERSON: Mr. Singh's going to
4 have another one made.

5

6 CONTINUED BY MS. ANITA SOUTHALL:

7 MS. ANITA SOUTHALL: Sorry, just before I
8 turn to that, Doctors Kubursi and Magee, on this issue of
9 stranded costs, are you able to comment on whether there
10 should be a limit on expenses incurred in ad -- in
11 advance of contracts?

12 Like, is there a percentage you think
13 would be prudent or at some point you should defer in
14 terms of incurring further cost?

15 DR. ATIF KUBURSI: No, I -- we're not
16 prepared to put a percentage or a fixed number.

17 MS. ANITA SOUTHALL: Could I ask you,
18 please, and those following in the document we've now
19 marked as PUB Exhibit 20. It's entitled KM Cross-
20 Examination Book of Documents PUB Counsel. If you could
21 turn to tab 2, this is a response to PUB-KM number 14, an
22 IR response, and it's on the issue of moral hazard.

23 Do you have that in front of you, Doctors
24 Kubursi and Magee? You're indicating yes.

25 DR. ATIF KUBURSI: Yes.

1 MS. ANITA SOUTHALL: You spoke yesterday
2 about the concept of moral hazard, and in the IR response
3 at 14(a) in the last sentence, this -- there's a
4 statement:

5 "This lack of incentive to take care is
6 called moral hazard."

7 Do you see that?

8 DR. ATIF KUBURSI: Yes, I see.

9 MS. ANITA SOUTHALL: And I believe you --
10 you may have touched on this yesterday or spoke a bit
11 about it, but in terms of the definition you've provided
12 in response then to the IR question, and as you talked
13 about it yesterday, could you just elaborate on how moral
14 hazard relates to Manitoba Hydro specifically?

15 DR. ATIF KUBURSI: Moral hazard, as you
16 can see from the definition we use, is about incentives.
17 You want to rig the incentives in such a way as to keep
18 people in the bound and within limits of what we call
19 moral behaviour, all right?

20 And more in the sense that you don't
21 insure your bike and you turn around and steal it; you
22 don't insure your property and turn around and get your
23 cousin to burn it, all right? I mean, it's -- basically
24 and fundamentally here, it's about not allowing insurance
25 to invite you to engage in improper or excessive risk

1 early that they're so underpaid, we didn't have to
2 continue. Oh, I'm serious.

3 MR. ROBERT MAYER: I'm sure hoping the
4 unions aren't listening to all this talk. Could we --

5 DR. ATIF KUBURSI: No, I'm -- I'm -- I'm
6 telling you, because I know some of these relative
7 payments between Ontario Hydro and here. But what we
8 really want here, and what -- what the issue is, is we
9 have argued for an individual responsibility matrix. We
10 wanted individuals to be responsible, and if you put an
11 individual to be responsible, then he has to, or she has
12 to be accountable.

13 And if you really want to illicit from
14 them the kind of behaviour and responsibilities, then
15 there should be some sort of a system that awards those
16 who abide and discharge the responsibilities
17 appropriately, and those who do not do it should
18 symmetrically be also penalized.

19 MS. ANITA SOUTHALL: Still at subsection
20 (b) of the answer, Doctors, there was a statement made:

21 "It is simply noticed that no action
22 was explicitly taken to hold a specific
23 person or office responsible for what
24 might be considered avoidable mistakes
25 during the drought."

1 Are -- are you talking about the 2003/'04
2 drought there?

3 DR. ATIF KUBURSI: Yes, precisely.

4 MS. ANITA SOUTHALL: And could you just
5 elaborate on what you mean by "avoidable mistakes"?

6 DR. ATIF KUBURSI: By definition, if you
7 have suffered from a drought, and suffered in a -- in a
8 way that it could be deemed an avoidable thing. I mean,
9 some people say, Look, you could have put -- exercise,
10 put some goals, or hedges and things, or you could have
11 kept more water into the system, whatever it takes.

12 And this is something that we believe that
13 there should be a yearly review. Professors were
14 reviewed every year; did we do well with our teach --
15 students, did they give us good evaluations, did we
16 publish enough through reference journals, are they in
17 the good ones, did we discharge our responsibilities in
18 the community, did we engage members.

19 I -- I think there should be a system such
20 as this at every corporation in which the outcome of a
21 business is to make net income, or -- and this could be
22 done by either maximizing your revenues or minimizing
23 your costs, but there should be some correspondence
24 between the realization or lack of realization, the
25 action or the inaction that would result in deviation

1 from these expectation and these norms and then somebody
2 has to be rewarded, somebody has to be penalized.

3

4

(BRIEF PAUSE)

5

6 MR. ROBERT MAYER: Doctor, I'm a little
7 troubled by your -- by that comment. I'm a small town
8 lawyer. I probably don't make as much money as any of
9 the other professionals in this room. I chose, however,
10 to -- money's not that important to me and I chose to
11 have more time rather than more money.

12 But I expect, at least of myself, that I
13 would continue to do the kind of quality job that most
14 other people do, or that the more highly paid
15 professionals do. And your discussion of moral hazzard
16 troubles me. I say that because I don't know that I have
17 an alternative answer, but I'm not entirely sure that the
18 risk/reward treatment of each and every individual, or
19 every problem is one that's justifiable.

20 And I know that's not a question.

21 DR. ATIF KUBURSI: You have a good point,
22 and I -- I need to clarify myself. I'm not Pavlovian
23 here. You know, like I -- I'm going to only use -- I
24 only give you a cookie if you do this. I mean, rewards
25 could be, you know, sel -- you know, congratulation of

1 people, recognition, status, appreciation. I'm not in
2 any way here suggesting that rewards and penalties should
3 really be financial and only financial one.

4 MR. ROBERT MAYER: Well, your comment
5 that you ceased going any further when you realized how
6 much money they were paid, I take it that was just an
7 off-the-cuff remark then?

8 DR. ATIF KUBURSI: No, but -- and -- and
9 -- and in some respects I -- I believe, and I'm sure you
10 do, in equity and treating -- treatment of equals as
11 equals and unequals as unequally. It's -- it's not only
12 horizontal. It has to also maintain some vertical
13 elements. I mean, if I give everybody the same thing and
14 they contribute differently, I think I'm just violating
15 equity just as much as the first case.

16 So the other thing about moral hazard, I
17 mean, the choice of words is probably wrong here. I
18 mean, it looks as if we're only looking at morality and
19 things. No. I mean, we're talking about some very
20 issues of the way incentives are structured so that
21 people would not be invited, would be seduced into doing
22 things they should not, and it's not in the best interest
23 of the organization or the economy or the society.

24 MR. ROBERT MAYER: We'll have that debate
25 some other time when we have some more time to do it

1 because I -- I come from a community where for many, many
2 years the bonus was what people made their money on when
3 they were underground. Those of us in the labour
4 movement or affiliated with the labour movement often
5 said, Bonus kills, but it also paid very well.

6 DR. ATIF KUBURSI: But you mentioned, Mr.
7 Mayer, that part of your rewards was that you have more
8 time, that you are also a respected member of the
9 community where you are and you felt -- well -- well, I'm
10 -- you didn't say that, I'm saying it. You didn't say
11 it, but I'm saying it.

12

13 CONTINUED BY MS. ANITA SOUTHALL:

14 MS. ANITA SOUTHALL: Just one (1) final
15 question, Doctors, in this area. For the Board as a rate
16 regulator, from their perspective, what conditions could
17 they take into account to effect the keeping of this
18 potential for moral hazard in check?

19 DR. ATIF KUBURSI: It's the structure of
20 reward and appreciation and checks and balances. These
21 are the kind of things that I'm talking about, is that
22 people would understand and recognize that they cannot be
23 derelict and cannot be dismissive of certain triggers or
24 red flags or things, that everybody should be on their
25 toes, so to speak, to make sure that nothing affects

1 adversely the behaviour and the consequences and the re -
2 - the outcomes of a risk event.

3 THE CHAIRPERSON: Mr. -- or, Dr. Kubursi,
4 I have a question on this that's got nothing to do with
5 rewards and penalties. But the -- and certainly not
6 looking to go back and revisit the drought again.

7 But the concept of avoidable mistakes, I
8 mean, mistakes are sometimes an advantage as one moves
9 forward from a review perspective after the event to --
10 to gain from what learned -- what one can learn from a
11 mistake, which mistake, if you're running a company that
12 has three (3) employees, may be considerably less,
13 although it appears more grievous to the company, the one
14 that has twenty thousand (20,000), type of things like
15 that.

16 But are we dealing with an environment
17 which looks back without -- without fear or fear of
18 punishment to be able to view events to try and see what
19 they can learn from it?

20 DR. ATIF KUBURSI: I -- I take this to be
21 quite an -- a serious issue. My worry is, what is the
22 incentive for people to learn from their mistakes, all
23 right. You see, there could be a culture of entitlement
24 or a culture of laxity.

25 I've been in many organizations in which

1 people feel that they are so secure in whatever they're
2 doing, and, therefore, it's -- it's a great effort, and
3 it's unnecessary effort for them to rectify situations
4 when they...things. I don't want to put this on record,
5 but United Nations is known for it, and -- because there
6 is very lax system of rewards and penalties and other
7 appreciation systems.

8 This has been a real issue in the
9 governance of the organization. And I'm very much
10 convinced that people need to, given the incentive, not
11 necessarily through financial or anything. But there
12 should be in the working of the system an arrangement,
13 whatever word we want to call it, where people would find
14 it compelling and necessary to learn from their mistakes,
15 and that should not be dismissive that, Well, who cares.
16 I mean, that's -- that's the issue.

17 MR. ROBERT MAYER: Doctor, you -- you
18 comment about the United Nations. The group of people
19 that I have heard the ac -- that accusation levelled
20 against most often, interestingly enough, have been
21 tenured teachers.

22 DR. ATIF KUBURSI: Tenured professors?
23 No.

24 MR. ROBERT MAYER: I -- I said teachers.

25 DR. ATIF KUBURSI: But -- but even

1 tenured professors, we're evaluated yearly, and one (1)
2 of the reasons I was so happy to retire early is to...

3

4 CONTINUED BY MS. ANITA SOUTHALL:

5 MS. ANITA SOUTHALL: Doctors Kubursi and
6 Magee, I'm now going to turn to the concept of Black
7 Swan, which you spoke a little bit about in your oral
8 testimony. And there is a reference document here. I
9 actually excerpted a page of the transcript and the
10 testimony of Mr. Judah Rose from ICF. That's at Tab 3 of
11 the reference book of documents, PUB Exhibit 20.

12 Specifically, at page 2,545, Mr. Rose, in
13 talking about the concept, makes the statement between
14 line 15 and 19:

15 "You don't have the sufficiently
16 detailed historical record to eliminate
17 the concern of seeing something that
18 never has happened, or there's no ante
19 -- historical antecedent for it, but
20 you can't measure exactly what it --
21 how likely it -- is it."

22 Do you see that statement? Would you
23 agree that's another way of referring to that concept of
24 Black Swan?

25 DR. ATIF KUBURSI: Yeah. I mean, the

1 story -- maybe I'll take a little bit here to tell you
2 that the guy who discovered this is a cousin of mine,
3 Nassim Taleb. He comes from the same village as -- as I
4 -- I come from, and it's -- it's quite an interesting
5 thing. We have lots of discussions with him on this one
6 here.

7 His position is that, you see, there is
8 all these white swans, and then, if you didn't see the
9 one in Australia, the black swan, wherever it is, you
10 would have never known. So this is about certain events
11 that are, you know, extremely unlikely but could happen
12 any time, you see, in -- in a sense because the
13 consequences could be extremely large. And the issue
14 that they didn't happen, you didn't see them, does not
15 mean that you can dismiss them.

16 So the issue is that because it's low
17 probability, it does not mean it would not happen at all.
18 So you want basically to say that just because it's low
19 probability doesn't mean it's not a possibility, and that
20 some of these, specifically those that have extremely
21 large consequences, you can't dismiss.

22 You know, you cannot train pilots all the
23 time on the average weather condition because if a bad
24 weather happens that doesn't happen often but comes in,
25 you're putting so many lives at risk. And the fact that

1 this turkey, you fed him every day, does not mean that
2 one day you're not going to chop his head.

3 So this is basically and fundamentally the
4 issue here: the -- the fact that things may not have
5 high probability does not mean they're not going to come,
6 they're not going to happen, should not really take them
7 into account and should not be prepared to deal with
8 them.

9 MR. ROBERT MAYER: Doctor, is -- when you
10 were dealing with the -- with what we call the Black Swan
11 concept, is a Black Swan foreseeable or not? Is it an
12 event that one could foresee? I could imagine seeing a
13 Black Swan, having never seen one before because every
14 one I saw was always white, but I -- I could foresee a
15 bird of a different colour, different from any other ones
16 I've seen before. I know of -- I know of albino buffalo,
17 albino bison, so -- but would every Black Swan event have
18 been foreseeable? Because, of course, if it's not
19 foreseeable, there's really very little anybody can do to
20 plan for it, is there?

21 DR. LONNIE MAGEE: Well, I -- I think the
22 -- the main feature of these Black Swan events is that
23 they're not foreseeable, I would say. Once -- you know,
24 now that we've latched onto the example of Black Swan,
25 and that helps us to think about, well, what if there was

1 a -- you know, a purple tortoise or something? You know,
2 we can kind of extend it, but the next Black Swan thing
3 would be in some totally different area that we couldn't
4 imagine.

5 So I think the -- it's -- it's a helpful
6 concept for talking about risk management, but -- and --
7 and it's important to think about all the possibilities,
8 even low probability ones, but no matter what you do,
9 there will be these Black Swan events. And there might
10 be low probability events that aren't kind of exciting
11 enough to qualify as being Black Swan, but it would be a
12 shame to be -- to not think about them out of being
13 distracted by more interesting fanciful Black Swan
14 possibilities.

15 MR. ROBERT MAYER: Would I be more
16 precise if I were to be defining a Black Swan event as a
17 -- an event that is not reasonably foreseeable in the
18 circumstances?

19 DR. LONNIE MAGEE: That sounds like a
20 nice way to put it.

21 DR. ATIF KUBURSI: I -- I would agree. I
22 mean, the whole issue here that Taleb was basically
23 putting forward is that the realm of probability does not
24 exclude the realm of possibility. That just because
25 something is not known to happen with a positive

1 significant probability or just positive probability
2 doesn't mean that we can dismiss it.

3

4 CONTINUED BY MS. ANITA SOUTHALL:

5 MS. ANITA SOUTHALL: I want to take you,
6 Drs. Kubursi and Magee, from that comment to Tab 4. And
7 this is another excerpt of the transcript, still in
8 conjunction with the testimony of Mr. Rose of ICF. And
9 specifically, a discussion by the Chairman, Mr. Lane.

10 If you could turn to page 2,757 in that
11 tab, that's the start of the transcript excerpt I want to
12 bring your attention to. And going onto the next page,
13 2,758. Mr. Lane identifies a drought period of twelve
14 (12) to fourteen (14) years in the -- a flow record.

15 Do you see that reference?

16 DR. ATIF KUBURSI: Which line?

17 MS. ANITA SOUTHALL: It would start at
18 the bottom of page 2,757, line 24 and then up onto the
19 next page, right down to line 18.

20

21 (BRIEF PAUSE)

22

23 MS. ANITA SOUTHALL: And I'm no -- not
24 sure whether or not that relates specifically to this
25 concept of Black Swan, but I pose the question: Is it

1 enough for Manitoba Hydro to develop a risk plan for
2 drought that only takes into account the potential of a
3 five (5) year drought or a seven (7) year drought ba --
4 based on this particular discussion by the Chairman of
5 the flow record in that period of time?

6 DR. ATIF KUBURSI: Well, first let me
7 just say, the fact that this has happened and is an
8 occurrence, it's not a Black Swan, all right, so we
9 accept this. The fact it happened its -- itself and it's
10 a -- with a positive, probably not very significant
11 probability, is something to be concerned about. But
12 that what we want to know here, what is the likelihood of
13 this and how is this going to adversely affect your net
14 revenues. So what you really need is to assign a value
15 at risk to this and get a fix on it.

16

17 (BRIEF PAUSE)

18

19 MS. ANITA SOUTHALL: In -- in your
20 preparation of the report and thinking through this
21 concept of Black Swan, did you turn your mind to what a
22 Black Swan might be for Manitoba Hydro?

23 DR. ATIF KUBURSI: No, we didn't. I
24 mean, it -- it would be nice to always think of this in
25 the back of our mind. I mean what is quite relevant

1 about the issue you ask, Ms. Southall, is that it's in
2 the data. We must have factored it in, it came in.

3 So all these things that you have here
4 would be part of the frequency tables that we created and
5 looked at probabilities of a particular drought being
6 things. We have not looked at something that is not in
7 the data. We tried to see within this data all possible
8 things that would have come, we tried to account for it,
9 but we did not go beyond that data to talk about these
10 things.

11 Although, I don't know, and I -- if my
12 colleague would like to talk about it, is when you look
13 at the tail, at the extreme value of things, it would not
14 appear there either, would it?

15 DR. LONNIE MAGEE: No, as I mentioned
16 yesterday, that the extreme value approach is -- is not -
17 - it's -- it's just moving a little bit in the direction
18 of Black Swan. It's taking what you've already seen and
19 trying to say something about a little bit further off in
20 the extreme, but not some totally unexpected combination
21 of events.

22 MS. ANITA SOUTHALL: Doctors Kubursi and
23 Magee, without disclosing any confidential information in
24 terms of contractual terms impending or -- or set between
25 Manitoba Hydro and its counterparties, can you address

1 the issue of whether or not Manitoba Hydro's worst-than-
2 recorded adverse water contract clause offers any relief
3 for the period I've just identified? In other words, a
4 period of the water flows from 1929 to 1943, where you
5 would have some small recovery for a two (2) year period
6 in-between successive extended drought periods?

7

8 (BRIEF PAUSE)

9

10 DR. LONNIE MAGEE: The -- this occurrence
11 could, if it happened right now or when significant
12 expenditure was -- is going on, would create a
13 significant problem. And I don't think anyone has
14 claimed that that could not possibly happen. It just --
15 either within or outside of Hydro, it's just inherent
16 risk involved with -- with the water flows, and you just
17 do your best to -- to prepare.

18 But, you know, it's possible, as we've
19 seen in the data, for extended drought. It would be bad.
20 But in the very long run, things balance out. It would
21 be especially bad if it happened at certain vulnerable
22 times.

23 MR. ROBERT MAYER: I was going to say, if
24 from here on in this year turns out to be a drought year,
25 that would be a Black Swan event, judging from what I've

1 seen around so far.

2 THE CHAIRPERSON: I was just going to
3 say, from a different field, in insurance, for example,
4 they buy various kinds of re-insurance to address
5 situations that are extremely rare, like a massive
6 province-wide hail storm, for example. They tend to be
7 localized rather than huge sort of territories, and I'm
8 not aware, I think we have already on the record asked
9 Manitoba Hydro about what type of catastrophe insurance
10 they have, and the only thing that comes to my mind was
11 that they had no business interruption insurance. I'm
12 not sure about this, but you can buy insurance against a
13 drought. I suppose you can buy anything.

14 DR. ATIF KUBURSI: I mean, there was some
15 discussion about this, and there was a market that
16 operated for a little while, and, for some reason, in the
17 mid-west, and -- and it disappeared.

18 THE CHAIRPERSON: Well, even the
19 insurance companies that take on these risks have that be
20 capitalized at a certain level, so perhaps there's some
21 risk that go beyond the capacity of the market itself.

22 DR. ATIF KUBURSI: They literally backed
23 out of it, I mean, and probably this would be a good
24 reason, yeah.

25

1 CONTINUED BY MS. ANITA SOUTHALL:

2 MS. ANITA SOUTHALL: Just on this issue
3 of probability and staying with this concept of a five
4 (5) year drought back-to-back with a seven (7) year
5 drought that I was speaking to a moment ago.

6 Are you able to comment on the probability
7 of occurrence? Is it -- is it the probability less than
8 one (1) in a hundred years? Can we think of it that way?
9 Or is -- is it -- if it's not, can you just address that
10 point?

11

12 (BRIEF PAUSE)

13

14 DR. LONNIE MAGEE: We didn't calculate
15 the probability of that specific event, but, just
16 generally, when -- in -- in these planning models, when -
17 - when the -- the hypothetical water flow series are put
18 in, I -- I think that somehow, to me, it seems more
19 satisfying to put in a long sequence of flows, of
20 different types of flows, without worrying about
21 classifying specific years as drought years or non-
22 drought years because they're really -- I think we fall
23 into a kind of a trap of thinking there's only two (2)
24 ways it can go: drought, which is like this, or non-
25 drought, which is like that.

1 But there's actually -- you know, you can
2 have two (2) years that are almost exactly the same. One
3 might be a little bit above what we've happened to have
4 defined as a drought, and one is a little bit below. You
5 could have one (1) five (5) year drought that's not so
6 bad, another three (3) year drought that has, you know, a
7 couple of terrible years that could be worse than a five
8 (5) year drought. You could have ten (10) years that are
9 almost like a drought that's worse than, you know, two
10 (2) drought years followed by six (6) great years
11 followed by two (2) drought years.

12 So I think the -- the -- framing it around
13 whether there's a drought or not a drought is -- and --
14 and basing the discussions on that, it's a convenient way
15 of saying whether there's a problem or not with water
16 flows, but it -- it -- it kind of -- if we fall into it -
17 - into that kind of thinking too much, it -- it can lead
18 to, you know, some --

19 THE CHAIRPERSON: Dr. Magee --

20 DR. LONNIE MAGEE: -- misconceptions.

21 THE CHAIRPERSON: -- does it help, the
22 fact that, when you're looking at this particular
23 company, that it's owned by a -- a province, and all of
24 the Utility's debt is guaranteed by the province?
25 Because presumably, when you run the various tests and

1 come up to, you know, 1.2 billion, for example, in some
2 cases of a private company, for example, an event like
3 that would be terminal, and you don't have to presumably
4 work into your deliberations the -- the risk of continued
5 solvency, do you?

6 DR. LONNIE MAGEE: Yeah. The -- the
7 flipside of that is -- is that, if they're really good
8 years, the -- the private companies can accumulate a lot
9 of retained earnings. So I -- I think, in -- in this
10 situation, if, let's say, all the participants were all
11 on the same page and we all thought that everything was
12 set up correctly, it wouldn't be a problem to see Hydro
13 lose a billion one year, earn 2 billion the next year,
14 because everyone would -- would agree, well, they're
15 doing the right thing, and over time these different
16 events will balance out and things will go up.

17 But problems occur if, let's say, they
18 make \$4 billion one year, and then everyone -- you know,
19 there might be some concern that, well, the rates are too
20 high, let's make the rates lower. And then the next
21 year, there's a drought and they lose a whole pile of
22 money, and then people are -- you know, get upset
23 because, well, maybe now they have to borrow, whereas if
24 -- it -- it goes back to the -- the idea of the moral
25 hazard, where if -- if Hydro bore all of the benefits and

1 the risks in the -- in the long run, just watched its net
2 revenue number bounce around, as long -- you know, and
3 this is very hypothetical, but if -- if it could be set
4 up so that everyone thought, well, it's set up right,
5 there wouldn't be this kind of constant concern from one
6 year to the next based on variations in -- in water
7 flows.

8 THE CHAIRPERSON: Well, once you have a
9 certain particular set -- set of assets, then what
10 follows, follows. But again, returning to what -- the
11 subject I was saying was that if you were dealing with a
12 -- a company that had a certain amount of capital and no
13 assurance that it would be restored --

14 DR. LONNIE MAGEE: M-hm.

15 THE CHAIRPERSON: -- you'd be dealing
16 with a different kind of animal, wouldn't you -- wouldn't
17 you? You -- you might have some restraints when you were
18 trying to determine what -- what is an adequate capital
19 structure?

20 For example, my understanding is is if
21 you're a private utility you tend to have a debt-equity
22 ratio somewhere in the ratio of 60:40 --

23 DR. LONNIE MAGEE: M-hm. M-hm.

24 THE CHAIRPERSON: -- where everyone, you
25 know, all the parties in this room have been somewhat

1 comfortable, at least to date, without getting into the
2 issue of a decade of investment, with a 75:25 --

3 DR. LONNIE MAGEE: M-hm.

4 THE CHAIRPERSON: -- guaranteed by the
5 province with the rating agencies not seeming too -- too
6 concerned.

7 DR. LONNIE MAGEE: Well, yeah, I think
8 what makes this situation different, there -- there are -
9 - you know, the -- it would depend which private company,
10 but it -- in the private sector there's competition,
11 there's changes in demand for a company's products, you
12 know, GM, maybe over time the demand for their products
13 falls whereas -- and -- and that's possible to a lesser
14 extent with -- with hydro, but it's -- it's a monopoly.
15 We know people are -- are going to need energy ten (10),
16 twenty (20) year -- thirty (30) years from now.

17 So there is more, I think, long-run
18 stability on the demand side. And, you know, I can't
19 imagine how -- exactly how it would play out if it was a
20 private sector company, but I think I would be more
21 confident about the long run demand for the product of a
22 private sector company that was a monopoly in this
23 sector.

24 DR. ATIF KUBURSI: If I may. I mean, but
25 no question about it. No matter how you turn it around

1 the market is more vicious than the government and -- and
2 would punish without recourse. No question about it that
3 it would make a difference, and that the private
4 companies would have to be reliant on their own assets
5 and capital adequacy in far greater details and zeal than
6 a public company. And this is part of the moral hazard
7 we're talking about.

8 THE CHAIRPERSON: Thank you.

9

10 CONTINUED BY MS. ANITA SOUTHALL:

11 MS. ANITA SOUTHALL: Drs. Kubursi and
12 Magee, do you agree with ICF that Manitoba Hydro can
13 offset worse-than-recorded droughts by securing
14 additional transmission access to the United States? I -
15 - I think you spoke about the issue of transmission
16 rights are a form of mitigation or -- or --

17 DR. ATIF KUBURSI: Yeah.

18 MS. ANITA SOUTHALL: -- conversely a
19 benefit to Manitoba Hydro.

20 DR. ATIF KUBURSI: Yeah, but -- but let
21 me assert it this way, there are more than one (1) way to
22 deal with this. I mean you can't just say, Okay,
23 transmission alone I'm going to. But as -- as part of a
24 portfolio, part of a combination of things, yes, I -- I
25 can see easily -- along three (3) counts, 1) that you get

1 that firm exports designation. If you don't have that
2 secure transmission somebody might de -- declare you non-
3 firm or un -- not reliable enough.

4 There is the issue that you could import
5 just as you can export. There is the issue that you're
6 getting somebody else to pay for it than you paying for
7 it.

8 Three, that it is really -- you know,
9 transmission, tie-line capacity is a constraint, a major
10 constraint, a very binding constraint. So all these
11 things, yeah, I think would -- would argue in favour of
12 that argument.

13 MS. ANITA SOUTHALL: Would you agree that
14 another strategy would be to put in place sufficient
15 combined-cycle gas turbine thermal generation because
16 it's not hy -- hydrologically dependent -- or hydrology
17 dependent?

18 DR. ATIF KUBURSI: The -- the story, we -
19 - we come back to it, my grandmother was really far
20 better than economists, don't put all your eggs in one
21 (1) basket, diversification is a very credible strategy
22 to deal with things.

23 But you don't have to go all the way to
24 only one (1) option. I mean, it could renewables, DSM.
25 I -- I want the full range of things to be always

1 considered.

2 MS. ANITA SOUTHALL: You indicated in
3 your report, and you commented, I believe, in your
4 testimony that retained earnings are used for a number of
5 things and not -- ought not to be the -- the -- only
6 dedicated to the potential recovery from a drought
7 scenario. Is that correct?

8 DR. ATIF KUBURSI: Yes, that's correct.

9 MS. ANITA SOUTHALL: Could you just
10 identify what you mean by retained earnings are used for
11 a number of things?

12 DR. ATIF KUBURSI: Yeah. All right. I
13 mean, you know fairly well that access to capital
14 markets, rating companies, they use the retained earnings
15 part of the debt-equity ratio, the interest cover -- you
16 know, cover ratio, the investment-coverage ratio. I
17 mean, it -- it is a very major indicator of the financial
18 health of the corporation.

19 And if you risk that, you completely wipe
20 it out in one (1) adverse effect. You're putting too
21 much on the line. And what I'm really suggesting here is
22 that we should be prepared to consider a combination of
23 things so we don't have to be totally and exclusively
24 reliant on the retained earnings.

25 THE CHAIRPERSON: You realize, Dr.

1 Kubursi, that retained earnings in this particular case
2 is not like Google or Microsoft. It's composed of
3 deferred cost, contributions in aid of construction,
4 accumulated other comprehensive income, intangibles, and
5 no cash?

6 DR. ATIF KUBURSI: Yeah, and -- and that
7 -- that's all the more reason why I would not rely on it.

8 THE CHAIRPERSON: So maybe on this point
9 we could take our break, Ms. Southall.

10 MS. ANITA SOUTHALL: Yes, thank you, Mr.
11 Chairman.

12

13 --- Upon recessing at 2:57 p.m.

14 --- Upon resuming at 3:17 p.m.

15

16 THE CHAIRPERSON: Okay, Ms. Southall.

17 MS. ANITA SOUTHALL: Thank you, Mr.

18 Chairman.

19

20 CONTINUED BY MS. ANITA SOUTHALL:

21 MS. ANITA SOUTHALL: I want to move on,
22 Drs. Kubursi and Magee, to the concept of risk-
23 preparedness plans for Manitoba Hydro. I understand from
24 your report that your recommendation generally is that
25 Manitoba Hydro should develop risk-preparedness plans and

1 manuals for its major risks. Is that correct?

2 DR. ATIF KUBURSI: That's correct.

3 MS. ANITA SOUTHALL: And, specifically,
4 you found, I believe, that a drought-preparedness plan is
5 a critical necessity?

6 DR. ATIF KUBURSI: We still do. We -- we
7 argued that it would be nice to have -- and this is
8 something seem to have come up repeatedly. And we wanted
9 to overextend this from just being for drought-
10 preparedness plan to risk-preparedness plan in the sense
11 that there are other risks than just a drought.

12 Let -- let me give you my -- one (1)
13 example. I was struck by going into the director of one
14 (1) of the programs I'm teaching in, and I found that
15 McMaster has five (5) volumes on risk management in which
16 if you take out any leaf, any page, and there is an
17 incredible list of things that each manager or each
18 person was responsible would do.

19 And this is a public university, and
20 university is not known to engage in risky behaviour.
21 But it seems only natural and logical and reasonable to
22 codify the incredible experience that Manitoba Hydro have
23 accumulated over the years as how to manage, how to deal
24 with, the different risks, and that these should be
25 documented and made available to people to scrutinize and

1 to review.

2 Okay, I'll tell you, for example, unless
3 somebody can tell me that it's all embedded in the
4 experienced people, it would be nice to say what are the
5 triggers say of a drought. There must be some early
6 warning signs: the snow pack, the precipitation in April
7 and May, you know, and June. I mean, there must be some
8 triggers that become red flags, or at least yellow flags.
9 Yeah, wait a minute, I mean, there's -- things might
10 develop.

11 What are your plans? What would you do in
12 -- if 'X', then 'Y'? I mean, these are the kinds of
13 things that -- there must be incredible profound
14 experience, expertise, that need to be documented and put
15 forward so that it's for legacy. And for everybody there
16 would be no room for any hesitation, no room for any
17 doubt that there is some codified and well established,
18 and maybe even possibly reviewed and refereed by others
19 to see cond -- in fact, this is exactly what is required,
20 and is fully what is required, and that's what's the most
21 appropriate to do.

22 I think nothing could substitute for this
23 codification, this ability to put in paper or in a file
24 or whatever the mechanism that one would use, the
25 distilled experience and expertise that should come to

1 bear to deal with issues.

2 MR. ROBERT MAYER: Doctor, you are a risk
3 expert. You were surprised to find that McMaster
4 University has five (5) volumes. Tell me, Doctor, how
5 much dust was on those five (5) volumes?

6 DR. ATIF KUBURSI: I can't tell you
7 personally, no, but, no, honestly, I -- I must admit that
8 I asked the director, and it was absolutely an issue of
9 interest to me. I said, Have you looked at these? And
10 he was honest enough to say no, but he said, A lot of
11 time, the executive assistant had to look into a
12 particular thing when one (1) student broke their leg by
13 falling on the stairs, and we knew exactly what to do.
14 There was a level of comfort that I was really happy. I
15 did not expect it from McMaster, no. I have all the
16 respect for them, but...

17 MR. GAVIN WOOD: I was going to say
18 that's the first lie he's told today.

19

20 CONTINUED BY MS. ANITA SOUTHALL:

21 MS. ANITA SOUTHALL: Doctors Kubursi and
22 Magee, would a formal drought management plan for
23 Manitoba Hydro take into account allocation of hydraulic
24 resources to its vari -- various commitments and
25 opportunities? And I'm including domestic load, long-

1 term contracts, short-term contracts, the potential for
2 opportunity peak and off-peak sales. Would that factor
3 into that kind of plan?

4 DR. ATIF KUBURSI: You see, what we're
5 having here is a drought preparedness plan; we're not
6 having a -- a business plan. What -- what we want from
7 this is nothing that is tying the hands of the management
8 in the way they would operate their businesses. What we
9 really want here is a set of norms and instructions and
10 hypothetical and actual things where they could drill, they
11 could exercise, could simulate, could work, can revise.
12 I mean, we're talking about learning from mistakes.

13 I want it to be a very flexible and
14 helpful document, rather than one that would put the
15 management of the business of Hydro within a very tight
16 straightjacket that they would not be able to make
17 flexible decisions.

18 MS. ANITA SOUTHALL: Are you able to
19 comment on how a formal drought management plan could
20 have affected the outcome in 2003/'04?

21 DR. ATIF KUBURSI: This is hard for us.
22 I mean, we have the benefit of hindsight. I mean, you
23 have 20/20 vision after the events have happened. But,
24 that said, it's good that we could review back and see
25 what should really be in a drought preparedness plan,

1 knowing what we know now of indications, signals that we
2 did not act upon?

3 See, there are five (5) lags that we
4 typically talk about in economics. There's a recognition
5 lag, all right, in the sense that you don't know whether
6 this snow pack thickness is a real signal that things are
7 going to be worse. It may or may not.

8 Low precipitation. I mean, we know last
9 year, every thought we were just about going into
10 drought, and then it poured like crazy, and you don't
11 want to be in a position where you lose releasing water
12 and getting some...

13 But what I'm arguing, there is a
14 recognition lag, so you really have to put down what
15 would be the set of triggers, or what combination of
16 triggers, and what is the minimum set of triggers that
17 you consider to be reliable enough that it would tell you
18 that there is an impending drought or something.

19 Once you have the recognition one, there
20 is also a diagnosis, all right? You recognize something,
21 but you want to make sure you identify whether this is a
22 spurious, this is a fleeting confluence of events, or
23 this is a structural thing.

24 Once you get the diagnosis and the
25 recognition, there is another lag, and this is the

1 that in the sense we would know what is the
2 identification. What are the set of things that should
3 have been -- that would identified this, because there is
4 a identification problem here.

5 I mean, I might have a cold, but it's
6 purely a viral cold than one that is not treatable by
7 antibiotics and a bacterial one that would be treatable
8 by. So at least, you know, this would become a -- a set
9 of indicator signals, post markers, that would allow you
10 to react and react appropriately and properly.

11 And you don't have to depend on your
12 memory or on a nonqualified formal way of doing things.

13 MS. ANITA SOUTHALL: In your report,
14 Doctors, there was a suggestion that setting of
15 quantitative targets and rules should be extended to all
16 areas of operations, particularly power trading and
17 export sales.

18 Do you recall that --

19 DR. ATIF KUBURSI: Yeah. Yes, I --

20 MS. ANITA SOUTHALL: -- recommendation?

21 DR. ATIF KUBURSI: Yes, I recall it.

22 MS. ANITA SOUTHALL: Should that apply to
23 seasonally specific targets? Are you able to comment on
24 that?

25 DR. ATIF KUBURSI: Yes, I -- let me tell

1 you where we're coming from here. We were very happy
2 with the master control plan. We were very happy with
3 what Manitoba Hydro had already done in terms of credit
4 risk and merchant trades. And we saw that they were
5 putting stop losses, putting ranges on how much one is
6 given authority to a certain thing.

7 And we -- we liked the table of authority,
8 which now, you know, seems to be in line of what we were
9 rea -- really recommending all along with the individual
10 responsibility, but maybe extending it a bit.

11 We want this to be not restricted only to
12 the credit risks, and not only to the merchant trade,
13 that probably some of these stop losses, puts and calls,
14 lines of authorities, amounts that are really given to
15 different people be qualified, that's all.

16 Again, I mean you need -- we need the
17 balance here between being flexible and allowing people
18 some room for discretionary behaviour, but at the same
19 time we want to make sure that people do not extend or
20 exceed their limits and implicate the Corporation and its
21 survival and resilience in unnecessary ways.

22 MS. ANITA SOUTHALL: I believe in one (1)
23 of your responses to my earlier question in this section
24 you addressed the fact that risk preparedness plans would
25 assist in mitig -- mitigating the risk of loss of

1 institutional knowledge, a knowledge of persons who've
2 developed that expertise to be able to read those signs
3 and consider from past experiences what may need to be
4 done in future?

5 DR. ATIF KUBURSI: Absolutely. I mean,
6 this is exactly what I was arguing, is that there is so
7 much profound experience and expertise. And part of the
8 institution memory is to be codified. You can't depend
9 on the order of tradition. I mean, it evaporates very
10 quickly.

11 MS. ANITA SOUTHALL: What would you see
12 as the role of the middle office at Manitoba Hydro in
13 preparation of risk management plans and, specifically, a
14 drought preparedness plan?

15 DR. ATIF KUBURSI: We were very careful
16 to always indicate that the middle office should be
17 involved, but it should not be at the exclusive authority
18 on these things because they are certain things you have
19 to get from the front office. They have the experience.
20 They have the knowledge, but it should always be more
21 than one (1) pair of eyes, so to speak, and to avoid that
22 famous statement by IYC -- NYC, the lone wolf approach.

23 Now, I mean, what we really want to do is
24 to get the various parties to work together and for the
25 middle office to be a compliment and a supplement and a

1 cooperative relationship in which the actual basic online
2 hands-on experience is also complimented by managerial
3 and evaluation of alternatives and vetting through the
4 risk processes that the middle office would have the
5 exper -- experience and expertise to do, and -- and act
6 as a vetting, if nothing else.

7 MS. ANITA SOUTHALL: And because I
8 believe you've already described it again in one (1) of
9 your answers, and I -- I think it was to do with the five
10 (5) volume set at McMaster, the internal responsibility
11 system is tied into these risk preparedness plans; in
12 other words, individuals are tasked with responsibility
13 and, therefore, accountability for implementation when
14 necessary?

15 DR. ATIF KUBURSI: It's quite telling
16 that McMaster volumes have an individual responsibility
17 plan and assign individuals. And when they change, they
18 will send the extra pages that would show. There is
19 always a name; somebody's neck is on the line, all right,
20 and -- and that's nice.

21 MS. ANITA SOUTHALL: Those are my
22 questions in that area. I'm not sure the panel had any
23 further questions.

24 THE CHAIRPERSON: No.

25

1 CONTINUED BY MS. ANITA SOUTHALL:

2 MS. ANITA SOUTHALL: Thank you. I'm now
3 going to turn to the concept of the sale versus no sale
4 analysis that KPMG ran.

5 I take it, Doctors Kubursi and Magee,
6 you're aware of that analysis?

7 DR. ATIF KUBURSI: Yes, we are.

8 MS. ANITA SOUTHALL: Did you review the
9 net present value analysis provided to KPMG by Manitoba
10 Hydro?

11 DR. ATIF KUBURSI: Yes, and we were also
12 privy to the actual numbers that are confidential.

13 MS. ANITA SOUTHALL: Given your review of
14 the KPMG report, are you in a position to indicate
15 directionally how an increase in the capital cost of the
16 generation and transmission assets, an increase in the
17 order of 2 to \$4 billion would impact the net present
18 value analysis of -- reported in the KPMG report of the
19 sale-versus-no-sale scenario?

20 DR. ATIF KUBURSI: They seem to suggest
21 that the -- the sale one would lead to greater sales in
22 the sense that you would have now more export capacity to
23 sell. And it -- it also gives you the chance to work in
24 the transmission capacity. And this might even give you
25 the latitude that you can import at opportune time and at

1 prices that they consider to be favourable.

2 So, in many respects, they have really
3 come out with the proposition that the sale would give
4 you higher net retained earnings and would empower the
5 organization to have a better capacity to deal with
6 droughts than the no sale ones.

7 MS. ANITA SOUTHALL: But my specific
8 question, Dr. Kubursi, was that if the capital cost of
9 generation and transmission assets go up between 2 to \$4
10 billion over what KPMG was looking at and what you were
11 privy to in terms of accessing that information, what
12 would the directional impact be in terms of the net
13 present value analysis?

14 DR. ATIF KUBURSI: I -- I mean, you're
15 absolutely right here in the sense, but I was just trying
16 to just underline the mechanisms that they have to go.
17 That you can't look at it -- at -- only on the cost side;
18 you have to also look -- and they seem to have
19 concentrated more on the benefit side, where they look at
20 increased sales and reduction, costs of imports, and
21 build it in.

22 A more balanced way would -- would take
23 into account also the increased cost; no question about
24 it. That the way it was dealt with seemed to have
25 focussed on the benefits and worked with the actual

1 costs. They probably have not really worked in, as far
2 as I'm concerned, if I -- what I recall -- I have it with
3 me here. I don't think they worked into the situation
4 where there was increased cost.

5

6 (BRIEF PAUSE)

7

8 MR. GAVIN WOOD: Yeah, I'm -- I'm not
9 sure if the doctor understood the question fully. Is
10 that response -- is that responsive to -- no.

11

12 CONTINUED BY MS. ANITA SOUTHALL:

13 MS. ANITA SOUTHALL: Well, we'll just ask
14 one (1) further follow-up question on -- if the costs
15 increase over what KPMG had looked at from \$2 to \$4
16 billion in terms of further increase in costs,
17 directionally how does that impact the net present value?

18 DR. ATIF KUBURSI: It will bring it down.
19 I mean, I -- I -- I said this. The issue is, and I'm --
20 I just wanted to re-emphasize what I answered -- is that
21 I would really need to look at the net. The net would be
22 how much this increase in capacity to earn more revenues,
23 to reduce the course of imports and transmission against
24 the increase in the costs.

25 If other things being equalled, all the

1 revenue side remains unchanged, then surely, if you
2 increase the cost, the net present value is going to be
3 smaller.

4 MS. ANITA SOUTHALL: And, Doctors Kubursi
5 and Magee, in your opinion, should Manitoba Hydro's net
6 present value analysis of the potential costs benefit of
7 the export contracts incorporate the new generation
8 assets and Bipole 3 transmission asset?

9 DR. ATIF KUBURSI: Well, of course. I
10 mean, there's no question here is that this is one (1)
11 package, and you have to look at all the components, and
12 you cannot focus and concentrate on one (1) side and not
13 consider the other sides. And every time one (1)
14 component changes, if it is on the positive side, it
15 raises the positive things; if it rises on the negative
16 side, it subtracts.

17 So it has to be a package deal. It has to
18 take into account all the components and should not look
19 at only partial and segmentable entries of these elements
20 that ultimately get into the net revenue or net present
21 value of revenues of the future.

22 MS. ANITA SOUTHALL: Thank you. I -- I'm
23 going to turn now to the ICF report and questions
24 associated with the ICF findings on the net present value
25 of the export contracts. Here, I would like you to turn

1 your attention to tab 11 of the reference book of
2 documents, PUB Exhibit 20.

3 The first page in that tab, tab 11, is an
4 excerpt of the ICF -- sorry, I'm -- I just need to verify
5 if it's the ICF oral presentation or ICF report. Just a
6 moment.

7

8 (BRIEF PAUSE)

9

10 MS. ANITA SOUTHALL: I'm sorry. Thank
11 you. It's the GRA filing, Appendix 12.2, ICF report,
12 page 4, for -- for reference on the record, and
13 specifically at footnote 2 there's a description of the
14 net present value -- sorry, the statement, and I'll just
15 read it in:

16 "On a net -- pardon me -- on a present-
17 value basis, discounted to 2008/'09,
18 the cumulative reduction in bills could
19 be \$153 million by 2041 in the sale
20 case (includes contracts with NSP, MP
21 and WPS) relative to the no-sale case
22 (considers only the contract with
23 NSP)."

24 Do you see that reference?

25 DR. ATIF KUBURSI: Yes. Yes, I see.

1 MS. ANITA SOUTHALL: And have you had an
2 ability to examine this net present value analysis of
3 ICF, Doctors Kubursi and Magee?

4 DR. ATIF KUBURSI: Not beyond what I have
5 seen in the various transcripts and what you have given
6 us here.

7 MR. GAVIN WOOD: And -- and, Dr. Kubursi
8 and -- and Dr. Magee did have an opportunity to review
9 those. Sorry. Yeah, I'm saying Doctors Kubursi and
10 Magee did have an opportunity to review this material
11 overnight. Ms. Southall had given it to them ahead of
12 time.

13

14 (BRIEF PAUSE)

15

16 CONTINUED BY MS. ANITA SOUTHALL:

17 MS. ANITA SOUTHALL: Doctors Kubursi and
18 Magee, in respect of this ICF net present value analysis,
19 were you aware that the capital costs considered by ICF
20 were the -- what I will call the old capital costs, that
21 being, 6.3 billion for Conawapa, 4.6 billion for Keeyask,
22 and 2.2 billion for -- costs for Bipole 3?

23 DR. ATIF KUBURSI: I believe so, yes.

24 MS. ANITA SOUTHALL: And it's now on the
25 record of this proceeding that the capital cost of

1 Keeyask has increased from IFF-09 to IFF-10 by \$1 billion
2 to 5.6 billion. Conawapa has increased from 1.5 --
3 sorry, by 1.5 billion to 7.8 billion.

4 The capital cost of those two (2) projects
5 specifically are now projected to be 2.5 billion higher
6 than the numbers used in the ICF analysis, agreed?

7 DR. ATIF KUBURSI: Agree.

8 MS. ANITA SOUTHALL: And we also now have
9 evidence on the record that indicates that Bipole 3 has
10 increased in cost from \$2.2 billion to the latest figure
11 which is \$3.3 billion.

12 Are you aware of that?

13 DR. ATIF KUBURSI: I am.

14

15 (BRIEF PAUSE)

16

17 MS. ANITA SOUTHALL: So, Doctors Kubursi
18 and Magee, this is a similar question to the line of
19 questions I was asking you with respect to the KPMG
20 analysis.

21 With the increase in capital in the order
22 of 2 to 4 billion, on a net present value analysis, are
23 you able to comment on what you would expect to be the
24 outcome based on a 6.1 percent discount rate over thirty-
25 two (32) years, which I understand to be the ICF

1 assumption?

2 DR. ATIF KUBURSI: Yeah. I mean, you
3 have to multiply, you know -- I mean -- yeah, it's on.
4 No question about it now, you have the interest rate the
5 same, but you have the capital cost is higher. This is
6 going to subtract. I -- I would be surprised if the one
7 fifty-three (153) would -- would remain there.

8 I mean, the -- the -- the increase in the
9 cost of about -- you're talking about here \$3.6 billion
10 that -- that may not be a small number. And I didn't do
11 the calculations, but I would suspect just back of the
12 hand or eyeballing things, that one fifty-three (153)
13 probably is -- would be wiped out.

14

15 (BRIEF PAUSE)

16

17 MS. ANITA SOUTHALL: Doctors Kubursi and
18 Magee, I believe you're aware, and -- sorry, just give me
19 a moment.

20

21 (BRIEF PAUSE)

22

23 MS. ANITA SOUTHALL: Are -- are you able
24 to take an undertaking to do that analysis, using the
25 increase in capital costs? In other words, based on the

1 ICF assumptions, what it actually would look like?

2

3

(BRIEF PAUSE)

4

5 DR. ATIF KUBURSI: Do I have a choice?
6 Knowing very well my colleague and friend Roger is a very
7 competent guy in these things, and I will be more than
8 happy to review his calculations.

9 MS. PATTI RAMAGE: If I could just jump
10 in here, it might help to clarify that those aren't ICF's
11 calculations, those are Manitoba Hydro's calculations,
12 and they're not an MPV, they are -- that's a rate impact
13 number. So I -- I'm putting that out there. I -- I
14 leave it to you -- you and your counsel to determine if --
15 - if that affects your ability to take that undertaking,
16 but it's not an overall MPV number.

17 And I think that's explained at
18 Undertaking number 78 and then on the next page.

19 MS. ANITA SOUTHALL: That's fine, Dr.
20 Kubursi, you needn't take that undertaking.

21 DR. ATIF KUBURSI: Thank you.

22 MS. ANITA SOUTHALL: Thank you.

23 MR. GAVIN WOOD: And -- and -- and you're
24 right. He was just saying to me that he -- he would
25 prefer not to get into that calculation unless the Board

1 -- unless the Board wi -- wishes him to.

2

3 CONTINUED BY MS. ANITA SOUTHALL:

4 MS. ANITA SOUTHALL: If I could ask you
5 for the next few questions to turn to Tab 13 of the PUB
6 counsel reference documents.

7

8 (BRIEF PAUSE)

9

10 MS. ANITA SOUTHALL: Thank you. So just
11 looking at Tab 13. These are excerpt pages 15 and 17
12 from the ICF direct evidence presentation in this
13 hearing.

14 I take it you've had an opportunity to
15 examine them?

16 DR. ATIF KUBURSI: Yes, I did.

17 MS. ANITA SOUTHALL: As you're aware, ICF
18 has revised its natural gas price forecast down by 38
19 percent from that used when Hydro was establishing its
20 term sheets. Is that fair?

21 DR. ATIF KUBURSI: It is.

22 MS. ANITA SOUTHALL: ICF, at page 17,
23 which is the second document in the tab, revised its
24 outlook on carbon, reducing any carbon until 2018 at half
25 the value previously forecast, correct?

1 DR. ATIF KUBURSI: Correct.

2 MS. ANITA SOUTHALL: Can you confirm that
3 natural gas prices will also impact export prices
4 Manitoba Hydro will ultimately realize on the spart mar -
5 - spot market and -- and as negotiated in contracts?

6 DR. ATIF KUBURSI: Well, it's a
7 substitute fuel, and it's one used by competitors. To
8 the extent that this also will have any relevance for the
9 coal prices where the largest amount in the MISO market
10 is produced using coal, yes. And the impact of these
11 taxes on carbon, yeah, indeed are issues that would
12 impact the future price of electricity, particularly of a
13 low carbon type of electricity that Manitoba Hydro
14 produces.

15 MS. ANITA SOUTHALL: Can you comment on
16 how the impact of the lower natural gas price forecasts
17 by ICF impact the present value analysis of customer bill
18 impacts projected by ICF, the amount we were talking
19 about a moment ago, the 153 million over the time period
20 identified?

21 DR. ATIF KUBURSI: Yeah. I mean, given
22 the statement about bills and the way it was done, and
23 it's net -- net present value, but just in terms of the
24 concept of the net present value, anything that increases
25 the revenue or reduces the revenue, increases the cost,

1 reduces the cost, will have a direct impact.

2 So here you're really telling me that the
3 cost is rising, or the capital cost, and the revenue is
4 going to be less because, no question about it, the
5 reduction in the prices of natural gas, which is a
6 substitute and a competitive fuel, will -- will certainly
7 impinge the revenues on the exports in the opportunity
8 market, unless, you know, we have a capacity here to sign
9 contracts with the export price that is not related to
10 the natural gas price.

11 MS. ANITA SOUTHALL: Drs. Kubursi and
12 Magee, if -- and everyone who's following, if I could ask
13 you to turn back to Tab 11 in this reference book and
14 look at, starting on the second page at that tab,
15 Manitoba Hydro Exhibit MH-81, which is Manitoba Hydro's
16 response to Undertaking number 78.

17 In the response, and I'm not going to ask
18 you to look at a specific section of the response, but I
19 suppose where you could go to look if you wanted to this
20 afternoon is the last paragraph on -- on that first page
21 of the response. Manitoba Hydro states:

22 "The reduction in customers'
23 electricity bills of \$153 million on a
24 present value basis by 2040/'41
25 represents only a portion of the total

1 benefits of the sale scenario compared
2 to the no-sale scenario."

3 Do you see that?

4 DR. ATIF KUBURSI: Yes, I do.

5 MS. ANITA SOUTHALL: Are you able to
6 speak to what other economic benefits to the Utility
7 should be measured?

8 DR. ATIF KUBURSI: Well -- well,
9 certainly anything that raises the revenues. I mean, we
10 -- we have two (2) -- two (2) types of benefits, you
11 know. These are what we call commercial benefits, and
12 there are economic benefits and social benefits, all
13 right? So I'm going to speak only on the commercial
14 benefits here.

15 Anything that we talked about would raise
16 the revenues, it would be a positive increase to the net
17 principal value, anything that raises the costs would be
18 a subtraction. So what we're talking here basically is
19 the capacity of the increase in capital expenditures to
20 raise the level of output to a level that does not
21 compromise the price at which we are valuing things.
22 Well, indeed, this -- this would raise the net present
23 value of revenues. The extent to which it raises the
24 cost is an issue of subtraction, like to know what would
25 be the net value.

1 And what counts is not one or the other,
2 but the net value. And what would you include there?
3 Would you include the reduction costs of transmission,
4 the capacity to import at low cost? I mean, it's not one
5 (1) element, but -- but a number of elements. And as I
6 said before, it's a package deal. But I need to know
7 exactly the package, the components. Before I can make
8 any judgment, I need to see how these numbers stack out -
9 - or stack up, and then do the calculation. That I can
10 do if you give me the numbers.

11 MS. ANITA SOUTHALL: And you're not only
12 an economist, you're a mind reader, because my next
13 question is going to be:

14 Are you able to comment on the broader
15 economic benefits to the province -- to society maybe is
16 how you put it?

17 DR. ATIF KUBURSI: Yeah. I -- I'm in the
18 business of calculating impact of particular projects,
19 and there are a number of benefits that people can talk
20 about from investment. These pertain to value-added
21 increases, these pertain to increase in the jobs. Some
22 of the costs are not necessarily gross costs because if
23 you undertake an activity and increases the economic
24 health of the province, different levels of government
25 would reap benefits from the extra revenues that would be

1 generated, tax revenues that would be generated.

2 So typically, when you're talking about
3 economic benefits, you're talking about how much income
4 would be raised, and it would make a difference whether
5 this income is increased in the urban centres or in
6 remote areas. It would depend to a great extent also the
7 number of jobs, the quality of the jobs, the durability
8 of the jobs. If it's just purely construction jobs and
9 they're not coming from the region, they're coming from
10 outside.

11 So it also would impact the capacity of
12 the government to reap some of these benefits, and where
13 -- and what does it do with the money? If it takes the
14 money and give it to universities, that would be the best
15 thing you could do. So -- and so, in many respects, you
16 really need to know -- it's all right. So it's, allow us
17 a chance to -- okay. He wants me to be good. All right.

18 So the point that is really crucial here
19 is that there are certain what we call indirect benefits,
20 all right? There is also the issue here of exports. I
21 mean, I know some people consider it a mercantilist view
22 that exports should be considered a positive thing, but
23 ultimately every province have to balance its exports and
24 imports, and not only of electricity.

25 I mean, we don't grow bananas here, we

1 have to buy it from someplace. And the capacity to
2 export things and we earn something that we use to import
3 our requirements of things we don't produce is something
4 of a benefit. The fact that you are able to create a
5 node of industrial processing that would come to benefit
6 from lower costs of electricity and create jobs and
7 industrial experience is also a benefit.

8 So benefits is not something that you just
9 can limit to net returned earnings or net present value
10 to a commercial thing. It has to take the societal
11 variables that are beyond that, whether it is income of
12 communities that usually would be cut out, capacity of a
13 country to become an industrial centre, the capacity of a
14 community to earn income that would be denied in the
15 absence of this activity, and the general health of the
16 economy. These are, in my view, important benefits.

17

18 (BRIEF PAUSE)

19

20 MS. ANITA SOUTHALL: Doctors Kubursi and
21 Magee, we -- we have been talking about a -- a multi-
22 billion dollar decade of investment that Manitoba Hydro
23 is -- is contemplating, and certainly supported by the
24 Province of Manitoba.

25

Is there a metric in terms of -- for

1 example, for every billion dollar spent within the
2 province is -- is there that kind of a metric that can be
3 applied to a government or a Crown utility in terms of
4 what you would expect the return to be as -- as a broad
5 economic impact?

6 DR. ATIF KUBURSI: I -- I mean, these
7 metrics exist. It depends how much you're spending and
8 on what you're spending. If you spent all this money on
9 products and machinery that you import, and you import
10 from outside of Canada, then probably the impact that
11 would result would be limited. If you would generate
12 jobs in particular areas in a -- in a time when there is
13 no slack and no unemployment and then you're bringing
14 these people from jobs that they already have, the impact
15 would be very small.

16 The best impacts would come if you spend
17 more locally and you spend it on activities that are
18 generated in the local economy, and you spend it in a way
19 that does not tax the capacity of the economy to meet
20 these demands, then you get really good impacts.
21 Otherwise, you'll be basically substituting --
22 cannibalizing other activities.

23 So the issue is to what extent some of
24 these impacts are incremental impacts and they are
25 residentially, local impacts. So the extent of how much

1 what you spend is coming from the local areas, the extent
2 of which is coming from unused resources the impacts
3 would be larger. If they're coming from already used
4 resources then there is a cost. If you're buying it from
5 abroad it's a leakage. So there is a metric and if you
6 give me the components we can tell you exactly what they
7 are.

8 MS. ANITA SOUTHALL: Just circling back
9 to Manitoba Hydro's ratepayers, how should these broader
10 economic benefits to the province be considered and
11 balanced against the rate implications and risks faced by
12 ratepayers?

13 DR. ATIF KUBURSI: There are lots of
14 issues here. I'm going to abstract in the beginning from
15 any intergenerational things, all right, I mean, because
16 there are lots of generational things. I mean we have a
17 decade of investment and then decade of return. And some
18 of the people paying for it will -- might not be around,
19 you know, to -- to get the -- the beneficial -- I'm going
20 to abstract from this -- this issue of intergenerational
21 distribution and location.

22 It would be to the benefit, and the
23 benefits would be worth the risks, if one (1) can be
24 assured that the rates of returns on these investments is
25 positive and above what it would cost to run them in a

1 sufficient way that would allow us to build a good
2 measure or part of this capacity at the expense of others
3 paying for it than our people.

4 I mean, there is a good chance here that
5 if indeed export would pay for a good part of the fixed
6 costs of these investments, above their costs of
7 production, the people of Manitoba would get a expanded
8 capacity that they have to rely upon to deliver the
9 increased load in the future without having to pay for
10 it.

11 I mean, that would be great. The issue is
12 to what extent are we sure that -- that this is really
13 the case. And are the risks taken care of in a way that
14 we will not end up ourselves having to sustain and pay
15 for assets that we don't need now and need only long time
16 down in the future.

17 MS. ANITA SOUTHALL: I know you were
18 setting apart the intergenerational-equity issue. Are --
19 are you able to comment on that in terms of this plan?

20 DR. ATIF KUBURSI: Well, there's no
21 question about it, you know, you're talking about how
22 many years, you're talking about between now and 2030,
23 these things. Who's paying for it now, who's going to
24 get the benefit. I mean no question about it, tomorrow
25 if we get everything paid for here, now, and they they're

1 going to get the capacity in the future, so the new
2 generation would be getting all the benefits from an
3 existing capacity to meet the demand for electricity and
4 have not paid for it.

5 But if anything goes wrong, they would be
6 the people who would have to pay for it, including this
7 generation that would not even see any benefits of it.

8 MS. ANITA SOUTHALL: I am moving on from
9 that section, Drs. Kubursi and Magee, and I have some --
10 a few questions for you related to the development of the
11 economic outlook model. And I could refer you to
12 reference Tab 14 in the book of documents. And there,
13 there is a response provided by you to PUB KM-16, if you
14 wish a point of reference. And, of course, reference
15 your report as you wish.

16 If an in-house macroeconomic -- pardon me,
17 econometric model was not developed, I take it you're
18 suggesting a narrowing of the number of forecasting
19 sources to derive the economic data. I -- I heard that
20 from -- I think we took that from your report, but also
21 from your oral testimony, correct?

22 DR. ATIF KUBURSI: That's correct.

23 MS. ANITA SOUTHALL: And the inclusion of
24 a forecaster should be based upon accuracy criterion to
25 be developed by Manitoba Hydro?

1 DR. ATIF KUBURSI: Correct.

2 MS. ANITA SOUTHALL: What form of
3 criteria would you suggest Manitoba Hydro incorporate to
4 select forecasters?

5 DR. ATIF KUBURSI: A track record of
6 accuracy because what we do in any forecast, we calculate
7 forecast errors, and some seem to have a better track
8 record than others.

9 And what was a concern yesterday is that
10 some of these forecasts cannot be combined in a selective
11 arbitrary way because they come from some consistent
12 models. So what would it take would be to narrow down
13 the number of forecasters and to make sure that if you
14 take a variable, you take it from a whole collection of
15 variables that are coherent and consistent within the
16 model and the context of that development.

17 MS. ANITA SOUTHALL: And the benefit then
18 of selecting consistent variables is what? Could you
19 just take --

20 DR. ATIF KUBURSI: Well --

21 MS. ANITA SOUTHALL: -- that to the
22 result?

23 DR. ATIF KUBURSI: Yeah, I mean, the
24 results would be you'll have a more reliable forecast
25 that you could rely upon and depend upon, and you get --

1 get a little bit more assurance. I mean, look, the
2 future is very complex, and we know the -- its prediction
3 is -- is quite a hazardous activity. But some people
4 seem to have a better chance and some models seem to be
5 far more capable of generating, over time, forecasts that
6 are consistent and -- and more accurate.

7 You see, the -- the way people have
8 referred to this forecasting is the taste of the pudding
9 is in the eating in the sense that a good model is a
10 model that would predict well. I mean, there's some
11 economists that don't like this.

12 But, I mean, the general presumption here,
13 especially in forecasting, that what counts here is this
14 predictive ability, not the -- how good the equations are
15 or how reliable the equations are, but the extent to
16 which there is a track record that that model has over a
17 number of years consistently lower forecast errors.

18 MS. ANITA SOUTHALL: Thank you. I'm now
19 going to move on to a number of the findings of the New
20 York consultant that you gave consideration to, Doctors
21 Kubursi and Magee, in your work, and then ultimately in
22 your report. I want to start with Finding number 1,
23 which is referenced on page 45 of your direct
24 examination, and also emanates from your original report
25 at page 176.

1 I'm sure you're familiar with it, but
2 please access the report as you wish. The -- this is the
3 finding relating --

4 MR. GAVIN WOOD: He -- he has it now.

5 MS. ANITA SOUTHALL: Sorry?

6 MR. GAVIN WOOD: He has it now.

7 MS. ANITA SOUTHALL: Thank you.

8

9 CONTINUED BY MS. ANITA SOUTHALL:

10 MS. ANITA SOUTHALL: To the prices in
11 HERMES not being stale. That Manitoba Hydro makes
12 adjustments to expert forecasts as reasonable and
13 necessary, and the finding that Manitoba Hydro may wish
14 to be more formal, transparent, and to document
15 adjustments it makes.

16 Is that an accurate summary of that
17 finding?

18 DR. ATIF KUBURSI: Yes, it is.

19 MS. ANITA SOUTHALL: If you wish, you can
20 reference Tab 15 and those following reference Tab 15 in
21 the reference book of documents. Here we've included but
22 don't in -- intend to read in an NYC assertion from the
23 public document number 232.

24 And -- and, Drs. Kubursi and Magee, you've
25 referenced, I believe this, or gave consideration to this

1 assertion in --

2 MR. GAVIN WOOD: Could you maybe just
3 give him one (1) second. He's -- he's -- I think he just
4 is reading it.

5

6 CONTINUED BY MS. ANITA SOUTHALL:

7 MS. ANITA SOUTHALL: I'm sorry. Yes,
8 please. You're ready to proceed? There -- there is a
9 statement in the midst of the -- well, maybe I'll just
10 tie two (2) items together that are found in that
11 assertion. There is -- there is the allegation by the
12 NYC that:

13 "Only one (1) to (2) select personnel
14 know the source code in HERMES, and
15 there is no documentation in the
16 system. It is known as a black box and
17 nobody knows what is going on in
18 there."

19 Do you see those statements that I've
20 selected from the NYC public document assertion 232?

21 DR. ATIF KUBURSI: Yeah, I recognize she
22 made these things, but they're a contradiction because
23 she says two (2) people know, and then in the same
24 sentence says nobody knows.

25 MS. ANITA SOUTHALL: I -- I guess she --

1 I wasn't able to meet with her, but I guess she's saying
2 a limited number of people know.

3 DR. ATIF KUBURSI: But we -- we've argued
4 very strongly that we'd like documentation, formal
5 documentation of these models. That would be a good
6 idea. I mean, there is no question there is a tremendous
7 amount of knowledge. We've seen it demonstrated in every
8 model that we work with, and I'm sure you -- look, you
9 have Excel, you have Quattro, you have things. There is
10 always a very thick documentation that comes with it. It
11 would be nice, and this is something that's not beyond
12 the resources and the abilities at Manitoba Hydro to have
13 this formal documentation.

14 Maybe they are there, but we did not see
15 that formal, exactly commercial-like type of
16 documentation, what we call technical manuals, user
17 manuals. That would be great -- great help in one sense
18 or the other. Again, this goes to the institutional
19 memory. You would codify something that, if there is a
20 turnover or somebody goes, there is something codified,
21 formal exists there for others to use.

22 MS. ANITA SOUTHALL: Did you specifically
23 ask how many people know the source code of HERMES?

24 DR. ATIF KUBURSI: We argued too, and we
25 -- one (1) time I know we -- we got them all in one (1)

1 room, and everybody was, What on earth are you doing. I
2 said, I would like to really see the number of people who
3 are familiar with these models. And some of them have
4 worked on this model, went into another one. No, there
5 are people, and there is a good community. We want it to
6 be more formal, we want it to be more explicit, more
7 overt, and that they could work and learn from each
8 other. This is something that we have recommended.

9 MR. ROBERT MAYER: How many people were
10 in the room, Doctor?

11 DR. ATIF KUBURSI: Yeah, yeah. I don't
12 know. I didn't count heads, but I would say, you know --
13 how much would you say? Like twelve (12)?

14 DR. LONNIE MAGEE: I'd guess ten (10) or
15 twelve (12).

16 DR. ATIF KUBURSI: Yeah.

17 MR. ROBERT MAYER: More than one (1) or
18 two (2)?

19 DR. ATIF KUBURSI: Definitely more than
20 two (2).

21

22 CONTINUED BY MS. ANITA SOUTHALL:

23 MS. ANITA SOUTHALL: Part of the
24 transparency -- pardon me, transparency in the
25 documentation that you're calling for, Drs. Kubursi and

1 Magee, would include the adjustment to price inputs in
2 the models, correct?

3 DR. ATIF KUBURSI: Correct.

4 MS. ANITA SOUTHALL: In terms of
5 documentation, and I may be extending upon that, should
6 there be a set process or regimen followed for updating
7 forecast information?

8 DR. ATIF KUBURSI: I -- I think it would
9 be a preferable thing, if it doesn't exist. We suspect
10 it is there. I mean, they seem to be getting it every
11 month, and they use iterative 1 so they can update
12 continuously these prices.

13 MS. ANITA SOUTHALL: If the changes in
14 the models, the adjustments that are made in the models,
15 are not well documented, what is the risk that Manitoba
16 Hydro may use inappropriate information for input
17 purposes?

18 DR. ATIF KUBURSI: We've always -- and we
19 argued in our report and in our direct that we would like
20 to have a formal process of review, vetting,
21 verification, oversight. Written, formal documentation
22 would go a long way towards establishing this formal
23 oversight and avoidance of issues of the type that you're
24 raising.

25 MS. ANITA SOUTHALL: Were you able to

1 obtain an understanding of the pricing methodology used
2 by Manitoba Hydro?

3 DR. ATIF KUBURSI: It was explained to
4 us, yes, verbally, you know, but that's what I'm really
5 saying, I'd like to see some sort of a written formal way
6 of doing it, but we certainly discussed it. Actually, at
7 one (1) time I made the mistake referring to it and I was
8 corrected right on the spot.

9 MS. ANITA SOUTHALL: Were you able to
10 assess whether the market information incorporated in
11 HERMES was current?

12 DR. ATIF KUBURSI: No, I -- we didn't go
13 that far, but we understand that this is coming on a
14 monthly basis, and this adjustment, they take one (1)
15 extra months and then discard the one (1) before and move
16 in. It's an iterative way.

17

18 (BRIEF PAUSE)

19

20 MS. ANITA SOUTHALL: Drs. Kubursi and
21 Magee, can you please advise in terms of your obtaining
22 information from Manitoba Hydro on the pricing
23 methodology, whether any adjustments were made to the
24 market information that Hydro purchases? And here, let
25 me be clear, without disclosing any confidential

1 information or detail that you're required to keep
2 confidential.

3 DR. ATIF KUBURSI: No, it's our
4 understanding and has been also corroborated by other
5 consultants that at times Manitoba Hydro felt that this
6 forecast they're purchasing are optimistic and they
7 brought them downward.

8

9 (BRIEF PAUSE)

10

11 MS. ANITA SOUTHALL: With respect to the
12 conclusion that price was not stale in the models, that
13 was a conclusion for HERMES.

14 Was it also your conclusion for the inputs
15 for SPLASH?

16 DR. ATIF KUBURSI: We were confident that
17 this is the case for HERMES and then later on we found
18 that this was the case also for SPLASH.

19 MS. ANITA SOUTHALL: Are you aware that
20 IFF-'09 was based on 2008 price forecasts?

21 DR. ATIF KUBURSI: Yes, I was.

22 MS. ANITA SOUTHALL: Do you know whether
23 or not subsequent IFFs for Manitoba Hydro have been
24 updated to include the reduction in natural gas
25 forecasts, we discussed that about -- with ICF in the tab

1 I referred you to, and the carbon regime change?

2 DR. ATIF KUBURSI: No, I don't.

3 MS. ANITA SOUTHALL: If Manitoba Hydro's
4 forecasts have not been updated to reflect this
5 information, would they be considered stale, in your
6 view?

7 DR. ATIF KUBURSI: Well, I mean,
8 certainly would like to see the -- I said I don't know
9 whether they did it or not. In the event they didn't, I
10 would like to see that they do.

11

12 (BRIEF PAUSE)

13

14 MS. ANITA SOUTHALL: Thank you. I just
15 have a couple of more questions and then we'll break for
16 today. I know that other people have commitments, so
17 we're going to break a little bit early today.

18 Drs. Kubursi and Magee, the NYC has
19 recommended Manitoba Hydro consider developing forward
20 price curves, and I believe you've commented on these in
21 your testimony. Is that correct?

22 DR. ATIF KUBURSI: I know that they take
23 the forward price, they translate it into a spot price,
24 they try to really get it to the MHEB node, so there is
25 quite a bit going on. I would like to really see that

1 these forecasts are complemented or an alternative
2 generated, which is the forward price. And they've done
3 it, they seem to be doing it. It would be nice to
4 formalize it and see what would be the alternatives.

5 MS. ANITA SOUTHALL: Yes, those are my
6 question then for today given that I would be moving on
7 to a new section. So thanks very much, Doctors Kubursi
8 and Magee, and we'll see you tomorrow. Mr. Chairman.

9 DR. ATIF KUBURSI: Thank you.

10 THE CHAIRPERSON: We've had a long day.
11 Thank you very much. Thanks to all. We'll see you
12 tomorrow at 9:30.

13

14 (INDEPENDENT EXPERT PANEL RETIRES)

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16 --- Upon adjourning at 4:15 p.m.

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20 Certified Correct

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Cheryl Lavigne, Ms.

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