

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public Meeting

Réunion publique

December 13, 2006

Le 13 décembre 2006

Public Hearing Room
14th floor
280 Slater Street
Ottawa, Ontario

Salle d'audiences publiques
14e étage
280, rue Slater
Ottawa (Ontario)

Commission Members present

Commissaires présents

Ms. Linda J. Keen
Dr. Moyra McDill
Mr. Alan Graham
Dr. Christopher Barnes
Mr. James Dosman
Mr. André Harvey

Mme Linda J. Keen
Dr. Moyra McDill
M. Alan Graham
Dr. Christopher Barnes
M. James Dosman
M. André Harvey

Secretary: Mr. Marc A. Leblanc

Secrétaire: M. Marc A. Leblanc

General Counsel : Jacques Lavoie

Conseiller général : Jacques Lavoie

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Ottawa, Ontario

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--- Upon commencing on Wednesday, December 13, 2006 at
2:09 p.m.

MR. LEBLANC: --- la Commission canadienne
de la sûreté nucléaire.

We have simultaneous translation. If you
would, please keep the pace of speech relatively slow, so
that the translators have a chance of keeping up.

Les appareils de traduction sont
disponibles à la réception. Le version française est au
poste 8 and the English version is on Channel 7.

Please identify yourself clearly before
speaking so that the transcripts are as complete as
possible.

Les transcriptions seront disponibles sur
le site web de la Commission dès la semaine prochaine.

Please silence your cell phones.

Madame Keen, présidente et première
dirigeante de la CCSN va présider la réunion publique
d'aujourd'hui.

Madame Keen.

Opening remarks

THE CHAIRPERSON: Good afternoon.

1 Welcome to the meeting of the Canadian
2 Nuclear Safety Commission this afternoon. I'd like to
3 begin by introducing the members of the Commission that
4 are with us this afternoon.

5 On my left is Mr. Alan Graham, Dr. James
6 Dosman, Mr. André Harvey. On my right is Dr. Moyra McDill
7 and Dr. Christopher Barnes.

8 As well as the Secretary of the Commission,
9 Marc Leblanc, we are joined on the podium today by Jacques
10 Lavoie who is the general counsel to the Commission.

11 I'd like to note that the Commission is
12 still on an enhanced security status, as are many of the
13 facilities that we regulate, and as such, I will take
14 whatever measures to make sure that we do in cameras if
15 security matters are discussed. We will not be discussing
16 security matters in public.

17 Before adopting the agenda this afternoon,
18 I'd like to note that there were two supplementary
19 Commission Member Documents or CMDs, as I will refer to
20 them, which were added to the agenda after its
21 publication. And that publication was on December 1st,
22 2006. These supplementary Commission Member Documents are
23 listed on the updated agenda.

24 Also note that CMD 06-M61 contains
25 protected information and as such will not be discussed in

1 public. CMDs 06-M60 and 06-M65 will also be presented in
2 closed session.

3 With this information, I'd like to now call
4 for the adoption of the agenda by Commission members as
5 outlined in CMD document 06-M56.B.

6

7 **06-M56.B**

8 **Adoption of Agenda**

9

10 **THE CHAIRPERSON:** Do I have the concurrence
11 of the members?

12 For the record, I note that the agenda is
13 adopted.

14

15 **06-M57**

16 **Approval of the Minutes of**

17 **Commission Meeting held**

18 **October 5, 2006**

19

20 **THE CHAIRPERSON:** I will now call for the
21 approval of the minutes of the Commission meeting held on
22 October 5th, 2006.

23 The minutes are outlined in CMD document
24 06-M57. I note that there are no follow-up updates from
25 the October 5th meeting for today. I will also ask if

1 Commission members have any comments, additions or
2 deletions to these minutes?

3 Yes, Dr. Dosman.

4 **MEMBER DOSMAN:** Madam Chair, just to
5 inquire on Item 18, if the report on the "FIS" will be
6 presented in the future?

7 **THE CHAIRPERSON:** Are there any comments
8 from CNSC staff with regards to this item?

9 **MR. HOWDEN:** Barclay Howden.
10 We do intend to update the Commission on
11 that particular issue. I don't know the exact date.

12 **MEMBER DOSMAN:** Thank you.

13 **THE CHAIRPERSON:** So that item will come
14 back to the Commission at an appropriate time.

15 So are there any changes?

16 As such then, I would like to ask the
17 Commission members to approve the adoption of the minutes.
18 Do we have approval?

19 I note for the record, that we have the
20 minutes approved.

21

22 **Significant Development**

23 **Reports no. 2006-9**

24

25 **THE CHAIRPERSON:** The next item on the

1 agenda is a Significant Development Reports 2006-9 (sic).
2 The reports are outlined in CMD document 06-M58, 06-M58.A.

3 The Significant Development Reports are
4 already in written form. So we will ask senior CNSC staff
5 if they wish to add anything orally and in some cases, we
6 will have licensees making comments as well. And then we
7 will ask the members if they have any questions. We will
8 move through the Significant Development Reports.

9
10 **06-M58**

11 **Cigar Lake Project**

12 **Water Inflow Event**

13
14 **THE CHAIRPERSON:** So the first Significant
15 Development Report is under the responsibility of Mr.
16 Barclay Howden, Director General, Directorate of Nuclear
17 Cycle and Facilities Regulation.

18 It is Item 411, Cigar Lake Project Water
19 Inflow Event, which is a new item that we have although it
20 happened some time ago.

21 And so first of all, Mr. Howden, would you
22 like to make any additional comments before we turn to
23 Cameco?

24 **MR. HOWDEN:** Barclay Howden speaking.

25 Yes, I would just like to make a couple of

1 introductory comments. It's Barclay Howden, for the
2 record. With me today is Mr. Kevin Scissons, the Director
3 of the Uranium Mines and Mills Division.

4 We have presented the Significant
5 Development Report 4.1.1; the info as presented, we have
6 no amendments to it. We'd like to indicate to the
7 Commission though that we are awaiting a root cause of
8 this particular event. As well, from a regulatory
9 perspective, we've been working with Saskatchewan Labour
10 and Saskatchewan Environment. I believe Dr. Becker from
11 Saskatchewan Labour is in our Saskatoon office today.

12 Our intention is to come back one or more
13 times, as necessary, to apprise the Commission of this
14 incident and progress with it. As well, the licensee is
15 here.

16 That concludes my remarks.

17 **THE CHAIRPERSON:** So do we have a linkage
18 then with the Saskatoon office at this point? Are you
19 trying to establish that link?

20 **UNIDENTIFIED SPEAKER:** Yes, we are here.

21 **THE CHAIRPERSON:** Well, I think it's --
22 good afternoon to you too. It's early afternoon. So
23 welcome. We are now onto the item with regards to the
24 Water Inflow Event at Cigar Lake. So welcome to both
25 provincial staff and I believe staff at the CNSC and

1 perhaps licensees that are at the Saskatoon office.

2 I would like to then turn to Cameco and ask
3 Mr. Rogers if he has any comments that he would like to
4 make.

5 **MR. ROGERS:** Thank you, Madam Chair and
6 members of the Commission.

7 For the record, Terry Rogers, the Senior
8 Vice-President and Chief Operating Officer of Cameco.

9 While we are here primarily to address any
10 questions you might have regarding the significant
11 development, we have prepared a brief PowerPoint
12 presentation that we'd be happy to share with you to
13 provide additional background information and some of
14 Cameco's current perspective.

15 **THE CHAIRPERSON:** Please proceed, Mr.
16 Rogers.

17 **MR. ROGERS:** All right. Thank you.

18 Well, for our partners and for Cameco,
19 obviously this inflow at Cigar Lake was a very significant
20 event in our world and we appreciate this opportunity to
21 address the event with you.

22 With me here today, to my immediate right
23 is Barry Schmitke, the General Manager of Cigar Lake, Dave
24 Neuburger, Vice-President of the Mining Division, and John
25 Jarrell on my far right, Vice-President of Safety, Health

1 and Environment; and behind me, Liam Mooney, the Senior
2 Legal Advisor for Safety, Health and Environment.

3 And I can see on the link to Saskatoon,
4 there's some additional Cameco staff at least listening
5 in.

6 So if I may, I'll just turn the
7 presentation over to John Jarrell who will run through the
8 presentation and then we'll be ready for questions.

9 Thank you.

10 **MR. JARRELL:** Good afternoon.

11 As Terry noted, we have prepared a few
12 slides which will provide some background information on
13 this significant event, both to supplement the CNSC staff
14 SDR and the 21-day report submitted by Cameco, as required
15 under Section 29 of the General Nuclear Safety and Control
16 Regulations.

17 At approximately 1:10 p.m. on October 22nd,
18 2006, a fall of ground accompanied by an inflow of water
19 took place. The inflow was initially estimated at 340
20 cubic metres per hour of water. The water flowed down to
21 the lowest parts of the mine where it was then pumped to
22 surface.

23 At the time of the failure, the underground
24 pumping capacity was 500 cubic metres per hour. Initial
25 planning was to construct a permanent concrete plug to

1 isolate the failed area. At approximately 4:00 p.m.,
2 water flow rate was estimated to have increased to between
3 1400 to 1500 cubic metres per hour, thus exceeding the
4 available pumping capacity of the mine.

5 Efforts switched to preparing to close the
6 two water control bulkhead doors which were installed to
7 isolate the north and south sides of the mine.

8 This slide provides a schematic of the
9 overall layout of the mine in relation to the ore body.
10 There are essentially four development levels. The first,
11 at 420 metres, shown in green, houses the main pumps to
12 dewater the mine. The main mine workings are on the 480-
13 metre level, which is shown in red.

14 At the south end of the mine, there is a
15 development at the 500-metre level, also shown in green,
16 largely to provide for underground ore processing.

17 This incident occurred at the north end of
18 the mine at the 465-metre level, which is closer to the
19 elevation of the ore.

20 The 465-metre level is displayed in yellow.
21 Freezing of the ore body occurred from the 480-metre level
22 whereas the mining will take place from the 465-metre
23 level.

24 The area shown in pink represents planned
25 develops at the time of the incident. The yellow hash

1 lines represent existing freeze pipes and current areas of
2 frozen ore.

3 Two areas are circled in this drawing. The
4 actual inflow area is shown, as well as the west bulkhead
5 door which will be discussed shortly.

6 Also shown in this schematic is work that
7 was underway to freeze the area around Shaft No. 2. There
8 are two bulkhead doors at the 480-metre level which
9 separate the north side of the mine, which is the future
10 production area, and the south end which will house the
11 ore processing circuit.

12 This cross-section schematic shows the
13 relative orientation of the four mine levels in relation
14 to the horizon of the unconformity and the high grade ore
15 body.

16 Note that in the circled area the ground
17 failure is believed to have ravelled upwards to the
18 unconformity which in turn allowed water to enter the
19 mine.

20 While the mine plan generally called for
21 freezing of the ore body from the 480-metre level prior to
22 production development of the 465-metre level, past
23 development work had led to the conclusion that it would
24 be safe to proceed with some limited 465-metre level
25 access development south of the ore body.

1 Note that the area of the inflow is not in
2 the immediate proximity of the high-grade ore.

3 This sketch shows the mine development work
4 carried out immediately prior to the incident. A west-to-
5 east drift was being constructed for future south-to-north
6 mining once the ore body had been frozen. The first sign
7 of instability occurred in a wedge failure which resulted
8 from the October 11th blast sequence.

9 The wedge failure was detected on the
10 northeast corner of the intersection. This is shown by
11 the arrowhead in the slide.

12 The seriousness of this failure was
13 recognized prior to October 22nd and normal development
14 work past this area was suspended as remedial measures
15 were implemented. It was during this period that the back
16 or the drift's ceiling failed at the intersection.

17 These four photos show a picture of the
18 ceiling or back of the drift prior to the inflow. Seen in
19 this photo is Shot Crete with additional bolting and
20 strapping.

21 The next photo in this sequence shows the
22 wedge failure to the north which halted the development.

23 The third photo shows the failure of the
24 back and finally the fourth picture shows the water
25 flowing in the drift following the failure. Ground

1 support was being applied in this development.

2 This is a close-up of the rock failure.
3 Within the rock pile are pieces of sandstone which led to
4 the conclusion that the failure had moved up to the
5 unconformity.

6 This is a picture of one of the two 480-
7 metre level bulkhead doors installed to segregate the
8 north and south sides of the mine. This picture was taken
9 on the north side facing the south end of the mine.

10 When it was decided to close these doors
11 electrical service water, drain water, compressed air
12 services that pass through pipes in the bulkhead housing
13 were removed.

14 Once emptied the service pipes were sealed
15 using preinstalled valves or blank planges. All personnel
16 were cleared from the north side of the mine and the doors
17 were closed.

18 The three-metre diameter east door was
19 closed first at 1 a.m. on October 23rd, and formed a tight
20 seal with little or no water leakage.

21 The four-metre diameter west door was
22 closed at 5:40 a.m. in a similar manner, however, while
23 closing this door, mud at the bottom of the door prevented
24 it from sealing properly. Closing was interrupted to
25 clear the mud and when the door was finally closed

1 approximately four metres of the door sealing gasket
2 became detached from the inside bottom of the door.

3 Attempts to seal the door by pulling it
4 closed with chain blocks were unable to establish a
5 watertight seal. A gap reported to range from about 1/8
6 of an inch to 3/16 of an inch remained.

7 Flow through the gap was calculated to be
8 approximately 800 cubic metres an hour and there were
9 three unsuccessful attempts to fully seal the door before
10 efforts to contain the water were abandoned.

11 Throughout the incident it was decided that
12 a two-hour window had to be maintained in order to allow
13 for evacuation of the mine in the event that the west door
14 could not be sealed. The two-hour refers to remaining
15 water storage capacity below the 480-metre level of the
16 mine.

17 While the final evacuation could be
18 described as intense and stressful, as the shaft station
19 did have water accumulation and the groundwater was cold,
20 the evacuation followed the established plan.

21 While the secondary backup hoist was
22 available the main hoist controls were reset at the bottom
23 of the shaft for surface control. A cage was maintained
24 above ground to ensure that it would be available when
25 required.

1 At the time of the final evacuation there
2 were 21 men at the 480-metre level. The cage was not
3 completely lowered, in order to keep it above the water
4 level and a ladder was used to enter the cage.

5 The final ascent went well. Three workers
6 were picked up at the 420-metre levels on the way up.
7 Electrical power underground was shutdown and a radiation
8 monitoring device was installed on the head frame.

9 No injuries were reported as a result of
10 this incident. There were no environmental impacts as the
11 water was fully contained within the mine and within the
12 surface storage facilities.

13 The radiation protection code of practice
14 was followed. Three notifications of short-term radon
15 progeny excursion were filed over the two-day event. A
16 maximum individual dose as a result of this incident was
17 well below one millisievert.

18 The water inflowing the mine had relatively
19 low radium concentrations which dropped from about 22 to 2
20 becquerel's per litre.

21 More notably, the water had relatively high
22 suspended particulate content being fairly turbid as a
23 result of fine particulate entering the mine with the
24 inflow.

25 The volume of the underground workings is

1 about 113,000 cubic metres which is about the volume of
2 surface storage but as previously noted, pumping capacity
3 was not able to keep up with the inflow.

4 During the inflow, a strong radiation
5 protection presence was maintained underground. This was
6 one of the key lessons learned from the McArthur River
7 inflow. We have learned that one should assume that water
8 inflows can carry with them significant dissolved radon
9 concentrations which can degas to form radon progeny.

10 Communication with the site Occupational
11 Health and Safety Committee was carried out during the
12 event and scheduled teleconferences were held with CNSC
13 staff, Sask. Labour, Sask. Environment, and Environment
14 Canada.

15 One of the other significant lessons
16 learned from the 2003 McArthur River inflow was the need
17 to give priority to communications. A number of town hall
18 meetings were held with onsite employees and contractors
19 and a special debriefing was held with the final 24
20 evacuees of the mine. Meetings were also held with the
21 Joint Occupational Health and Safety Committee.

22 A site visit was conducted with regulatory
23 staff on October 26th. The incident received substantial
24 discussions at a series of annual community-based
25 consultations held in the Athabaska Region from October

1 30th to November 2nd. And EQC representatives conducted
2 the site visit on November the 2nd.

3 A root cause analysis of this incident is
4 underway with the assistance of external consultants.
5 Included in this investigation is a technical review of
6 the geological conditions and engineering controls in
7 place for development.

8 We anticipate that the Commission will
9 request some form of briefing of this analysis and
10 Cameco's response to its corrective actions at some point
11 in the future.

12 A phased remediation plan is also being
13 developed. While the main contingency plan was to isolate
14 the north side of the mine with watertight doors in the
15 event that an incident such as this occurred, the
16 Environmental Assessment Study Report prepared in 2004
17 also contemplated possible mitigation from the surface.

18 A five-phase program is being developed.
19 CNSC staff have granted approval to carry out the
20 preliminary initial phase. This will hopefully be
21 followed by a staged approach of de-watering and securing
22 the south side of the mine, followed by securing the north
23 side.

24 This in turn would be followed by mine
25 rehabilitation work prior to resumption of pre-inflow

1 activities.

2 Final plans for the various follow-up
3 phases have yet to be fully determined and have not yet
4 been proposed to CNSC staff. The remediation process is
5 viewed as an iterative one at this stage.

6 This is a schematic of the first phase of
7 the remediation plan which is currently underway. The
8 objective is to pump sufficient volumes of low-slump
9 concrete and grout to hydraulically isolate the failed
10 area from the rest of the underground workings.

11 These are pictures of the surface drilling
12 currently underway. The top picture shows a conductor
13 drill. This unit installs the casing through the
14 overburden into the sandstone approximately 30 metres.

15 The bottom picture shows the setup of two
16 drills. These are conventional oil and gas drills using
17 directional drilling technology to steer the drill string
18 into the targeted area of the inflow. Following
19 completion of the holes, a separate contractor will be
20 used to inject the concrete and grout.

21 The timeline to complete this drilling
22 activity is estimated at two-to-four months. No
23 significant safety or radiation issues are foreseen and
24 there should be very limited risk of environmental impact
25 limited to those associated with conventional drilling.

1 And as previously noted, this was
2 previously identified "EA Contingency".

3 Thank you for your attention and for
4 providing us with the opportunity to describe the event.
5 We hope that this brief presentation will provide some
6 additional insight while it is clearly up to the
7 Commission to decide the path forward, we would request
8 consideration of a staged remediation plan such as just
9 described, coupled with periodic updates to the Commission
10 as so deemed necessary.

11 We would anticipate that there would be
12 staged CNSC staff approval requirements going forward and
13 believe that this would be a good model to deal with the
14 mine remediation.

15 This completes our presentation. We will
16 be pleased to answer any questions you may have or wish to
17 address to the licensee.

18 Thank you.

19 **THE CHAIRPERSON:** Thank you very much, Mr.
20 Rogers, Mr. Jarrell.

21 Do the CNSC staff have any comments with
22 regards to Mr. Jarrell's request, I suppose, of approval
23 of a staged approach?

24 Do you wish to make any comments at this
25 time or ---

1 **MR. SCISSONS:** Kevin Scissons, Director,
2 Uranium Mines and Mills Division.

3 We had discussions with the licensee on the
4 phased approach. We've accepted the first phase of the
5 remediation efforts that were identified in the
6 environmental assessment document, the one that was
7 approved by the Commission, and is also referenced in
8 support of the NXB documents in the current licence.

9 So the phased approach, as far as
10 remediation from surface, is all within the context or in
11 scope of the current licence. So we are on board with
12 that phase.

13 The subsequent phase and the details
14 thereof have not been discussed or presented, but we are
15 aware they are taking this approach and we will guide them
16 and communicate with them that path forward and confirm if
17 it indeed is within scope of the current licence and in
18 this phased approach that we are in a position to approve
19 accordingly.

20 If it tends to fall outside of that,
21 requires a licence amendment or any other action by the
22 Commission, we will then take that course of action.

23 **THE CHAIRPERSON:** So at that point, it
24 would come back to the Commission?

25 **MR. SCISSONS:** Yes.

1 **THE CHAIRPERSON:** Thank you.

2 Mr. Graham, would you like to start? Have
3 you got any questions at this point for either Cameco or
4 the staff?

5 **MEMBER GRAHAM:** Yes.

6 The two to four months that you talk about
7 -- maybe this is getting ahead of the whole issue -- but
8 the two to four months, does that mean that you'll have
9 enough concrete in place and so on that you can start
10 pumping or you will have the mine de-watered by then?

11 **MR. SCHMITKE:** Barry Schmitke, Cameco.

12 The intention in two to four months is to
13 have the plug in place but not de-watering commenced yet.

14 **MEMBER GRAHAM:** So the de-watering would
15 take place probably in the spring and summer conditions.
16 Is that right?

17 So what I'm coming at is, I guess, the
18 amount of water there and to be able to treat the water
19 coming out of the mine and so on, have you put together a
20 plan for that yet because of spring run-offs and so on?

21 **MR. SCHMITKE:** Barry Schmitke.

22 That plan will be part of the second
23 submission to the CNSC staff. So we have not completed
24 that yet.

25 **MEMBER GRAHAM:** And that would probably

1 only be done after the plug was put in place. I mean,
2 you'll know better at times and so on and what treatments
3 are required, will you?

4 **MR. SCHMITKE:** Barry Schmitke.

5 Our intention with phase 2 is to submit
6 that probably sometime in January once we have a better
7 understanding of how the drilling is going and what
8 successes and lessons learned we have from that.

9 We have just nicely commenced a drilling
10 program and we have one drill down to, I think, roughly
11 around 450 metres and the other one down at around 370
12 metres. So we are just getting into the program. So we
13 really can't comment on how successful -- we certainly
14 expect it to be successful but how long it's going to
15 take, it's difficult to say right now.

16 **MEMBER GRAHAM:** Is the entire mine below
17 the 465 level flooded, and I'm talking down to the 500 and
18 so on?

19 **MR. SCHMITKE:** Barry Schmitke.

20 Yes, the entire mine is under water.

21 **MEMBER GRAHAM:** And the area in under the
22 ore body, the shaft in under the ore body, is flooded
23 also?

24 **MR. SCHMITKE:** Barry Schmitke.

25 That is correct.

1 **MEMBER GRAHAM:** I think my colleague
2 probably, Dr. Barnes, will have questions with regard to
3 the anticipation of the type of rock and so on, because in
4 one of your slides, you did show the sandstone in that.

5 But what type of drilling program did you
6 have prior to the starting of sinking the shaft and so on,
7 did you do to know the composition of this type of rock
8 and so on that was above the 465 level?

9 **MR. SCHMITKE:** Barry Schmitke.

10 As part of our normal advance, we drill a
11 large number of probe holes to probe for water and any
12 unusual conditions. In this particular case, we drilled
13 13 probe holes into the area and we also drilled three
14 geotechnical holes which record and then analyze for rock
15 strength and determine what sort of ground support would
16 be required for that particular area.

17 **MEMBER GRAHAM:** So the type of ground
18 support that you are performing above the -- at the
19 ceilings of the shafts and so on, you felt were adequate
20 and had met all the engineering terms that you thought
21 might be required?

22 **MR. SCHMITKE:** The design for that area, we
23 have a design matrix. So based upon the geotechnical
24 assessment of an area, that dictates the type of ground
25 support that would be placed into that area, and that

1 ground support that was placed -- was to be placed in that
2 area satisfied the requirements of that assessment.

3 **THE CHAIRPERSON:** Perhaps we could go on to
4 some other and we'll come back in a second round.

5 **MEMBER GRAHAM:** Sure, that's fine.

6 **THE CHAIRPERSON:** Dr. Barnes?

7 **MEMBER BARNES:** I'd first like to ask
8 staff, why is it under these situations that we actually
9 don't have a detailed written document from the licensee?

10 We have a serious significant development
11 report and, granted that staff are generating much of the
12 information here, but a lot of this depends -- we're
13 really dealing with technical issues and all we have from
14 the licensee are a number of power points.

15 So I raise this because it's come up
16 before, I think, but I think in this particular case, I
17 just find this is an unsatisfactory part of our process.
18 So you might answer it specifically in this particular
19 case, but we may want to take it up as a matter of
20 procedure.

21 **MR. SCISSONS:** Kevin Scissons, Director.

22 The information that has been provided for
23 this was a notification to the Commission when it first
24 occurred. We went through the Secretariat to notify the
25 Commission members. We've had this extension of this

1 safety and development report for this meeting today. The
2 licensee has provided their 21-day report, as required by
3 the Act and the Regs, and we are currently assessing the
4 total outcome of this.

5 The root cause analysis and all
6 investigation work done and in harmonization with the
7 other regulatory agencies is under development.

8 I mean, it's difficult for us to come
9 forward and explain in a timely manner the outcome and the
10 sequence and our analysis of it until it has been
11 completed and completed by the licensees and we reviewed
12 it.

13 There are staff working on this. There's
14 staff who communicate with the licensee on our
15 expectations and the information that needs to be
16 provided. We clearly have received some of that
17 information. The 21-day report is a good step forward on
18 it, though it is absolutely incomplete for us to provide a
19 full assessment on that.

20 Our intent is and our commitment is to come
21 back to the Commission with a full analysis of this before
22 this project develops and clearly before it goes to any
23 level of mining back in there. It's a question of the
24 timing and the details we can have available to us and
25 report back to the Commission and provide the answers that

1 we know the Commission will be looking for.

2 **MEMBER BARNES:** I'll follow up later on it.

3 Having just heard from Cameco that there
4 were 13 probe holes and 3 geotechnical holes, why did it
5 fail?

6 **MR. SCHMITKE:** That's part of the
7 investigation that's ongoing right now. It's difficult to
8 say exactly what one thing caused it to fail. In these
9 sort of circumstances, there usually is a number of
10 factors that have to come together to have a failure like
11 this.

12 We do have a number of people and companies
13 working on the investigation.

14 Perhaps, Mr. Rogers, you'd like to add
15 something?

16 **MR. ROGERS:** It's Terry Rogers for the
17 record.

18 Yes, Dr. Barnes, we commissioned an independent
19 investigative team that is separate from the operations
20 divisions and is actually separate from me, to call
21 together internationally recognized experts in
22 geotechnical science, in mining and geology, and even
23 mechanical engineering, to take a look at all the
24 circumstances surrounding this event, and that obviously
25 will take some time for those people to pour through that

1 information.

2 In addition, it's a taproot exercise. So
3 we have Brian Lockhart who is running the taproot exercise
4 for this investigation and it's a matter of getting those
5 people having access to and going through the information
6 to come to the best conclusion of the causal factors, one
7 or many.

8 **MEMBER BARNES:** So I'm going to ask you
9 some specific questions.

10 From the roof or the drift that you had,
11 what was the height of -- what was the distance between
12 the roof of that drift and the unconformity?

13 **MR. SCHMITKE:** Barry Schmitke.

14 The designed distance was about 10 metres.
15 Unfortunately, we did have some unravelling of the back in
16 that area and the back was slightly higher. So we had
17 probably around nine metres in that particular location.

18 **MEMBER BARNES:** And how high is the drift?

19 **MR. SCHMITKE:** The drift would be four and
20 a half, roughly, four and a half metres.

21 **MEMBER BARNES:** So if you had nine metres
22 before you reached the base of the sandstone and you've
23 got a drift of four and a half metres, why would you
24 expect under a collapse to have Athabasca sandstone, as
25 you showed in the illustration, in the muck as you call

1 it?

2 **MR. SCHMITKE:** Barry Schmitke.

3 That's a very good question. I don't have
4 the answer at the moment. I think that's something that
5 has to -- it has to be part of the investigation as we go
6 forward.

7 **MEMBER BARNES:** In the -- from the probe
8 holes and the geotechnical holes, did you have a -- what
9 understanding did you have of the groundwater conditions
10 and potential flow rates in the lower part of the
11 Athabasca sandstone or in the unconformity zone?

12 **MR. SCHMITKE:** Barry Schmitke.

13 From the probe holes that we drilled, we
14 don't actually drill the probe holes through the
15 unconformity. They stay below the unconformity. The
16 cored holes, of course, go through the unconformity.

17 The probe holes were dry in that area, and
18 also there was no exhibiting of any inflow prior to the
19 event. So the area was dry.

20 The cored holes, they obviously made water
21 when they went through the unconformity. However, it's
22 pretty much limited by the size of the hole. So we don't
23 get necessarily full flow and it's all drilled under
24 security or protection with preventors and things like
25 that. So we would not have an inflow from the drilling

1 itself.

2 **MEMBER BARNES:** So is it fair to say that
3 the kind of geotechnical drilling that you do is such that
4 you don't understand the hydrogeology situation in this
5 case near the unconformity or the base of the Athabasca
6 sandstone?

7 **MR. SCHMITKE:** Barry Schmitke.

8 I think we have a fairly good picture of
9 the hydrogeology of the area. We know that above the
10 unconformity, the Athabasca sandstone is very wet and
11 obviously in this case, the ground did fail and there was
12 a major inflow.

13 **MEMBER BARNES:** In the diagram that you
14 show, this one of the geological cross section. You show
15 the unconformity as being very slightly undulating, more
16 as a straight line going across.

17 Is that the real topography on that
18 unconformity?

19 **MR. SCHMITKE:** Barry Schmitke.

20 No, this would be more of an artist's
21 interpretation rather than what the unconformity really
22 does. The unconformity is not flat. It tends to
23 undulate.

24 **MEMBER BARNES:** Over what sort of distance?

25 **MR. SCHMITKE:** It's generally over sort of

1 tens of metres.

2 **MEMBER BARNES:** So when you're -- and so
3 what kind of control would you have on the knowledge of
4 that through this particular line that you're drawing?

5 **MR. SCHMITKE:** Barry Schmitke.

6 That's the reason we drilled the cored
7 holes in the area. We have a large number also of surface
8 holes that we use to interpret the unconformity, but we
9 drilled cored holes in advance of development to try and
10 ensure that we know the status of the unconformity.

11 **MEMBER BARNES:** From what you're saying, I
12 am rather sceptical that you actually do know that because
13 I don't think you would have got the Athabasca sandstone
14 falling somehow 10 metres into an area that was four
15 metres in height. You said the situation generally was
16 dry, although admitted that the Athabasca sandstone is
17 wet, but you indicated that from the knowledge of the
18 hydrogeology, you at least under -- correct me if I'm
19 wrong here -- that you had no anticipation of flows of
20 that type, of that scale, potential flows.

21 **MR. SCHMITKE:** Barry Schmitke.

22 Two things. We were in dry conditions. So
23 we certainly did not anticipate encountering water. The
24 second thing that changed a bit is the geometry of the
25 area. We were at an intersection and, of course, there

1 was this pillar wedge that had come out and certainly that
2 may have been an influencing factor on the ground fall and
3 the subsequent inflow.

4 **MEMBER BARNES:** When you say you were in
5 dry conditions, this is in dry conditions at the 465
6 yellow added line, right?

7 **MR. SCHMITKE:** Barry Schmitke.
8 That is correct.

9 **MEMBER BARNES:** This within a matter of
10 metres is overlaying by the unconformity zone or the base
11 of the Athabasca which as you referred to it as being wet.
12 And as we know from the event, it was very wet.

13 **MR. SCHMITKE:** Barry Schmitke.
14 That is correct.

15 **MEMBER BARNES:** And on this diagram above
16 the circle marked "Inflow Area", right, you have a line
17 just above that that goes up towards where it says
18 geological cross section. I assume that's a fault.

19 **MR. SCHMITKE:** Barry Schmitke.
20 I can't say for sure that's a fault.

21 **MEMBER BARNES:** Well, it's similar to all
22 the other faults shown immediately to the right, isn't it?

23 **MR. SCHMITKE:** Right, but whether that was
24 an actually geologically interpreted fault or whether it
25 was part of the artist's licence, I guess, to make the

1 drawing, I just can't say.

2 **MEMBER BARNES:** So you're presenting
3 diagrams to us that are drawn by artists?

4 **MR. SCHMITKE:** No. This is -- it's
5 schematic drawn initially by a geologist and then rendered
6 for presentation.

7 **MEMBER BARNES:** Do you find that acceptable
8 when we're trying to deal with facts of an extremely
9 serious situation?

10 **MR. NEUBURGER:** Dave Neuburger, for the
11 record.

12 It is a schematic to provide multiple
13 information to people being able to see this. It's not
14 meant to be a detailed cross section. We certainly work
15 off of detailed cross sections and plans in the
16 engineering and geology area, but this is for display and
17 understanding of where the mine development is in context
18 with the ore zone and with the altered area of the ore
19 zone.

20 So it can't be considered to be to scale to
21 be exactly representative of the area.

22 **MEMBER BARNES:** Okay. But, again, correct
23 me if I'm wrong in this interpretation, but the reason the
24 ore body is there and the reason I'm sure that you show
25 faults there is that, typically, the mineralization is

1 along faulted zones, right? That's how the ore body is
2 localized in those areas.

3 This is a fault zone. It's a liniment. It
4 goes in a sense through this diagram. It's not -- and
5 since that cuts the Athabasca sandstone, these were faults
6 that occurred after deposition of the Athabasca sandstone.

7 So it's not at all unexpected that one
8 would have ancillary or parallel faults on either side of
9 the ore zone. I just happened to -- I mean, it's your
10 diagram. You're showing the fault and where does the
11 fault almost terminate, it terminates at the inflow area.

12 So I'm going to suggest that, (a) that
13 there is some significant issues here which I think the
14 Commission should know about in a discussion like this.
15 This is a significant -- an SDR for which, I think, the
16 Commission deserves to have a fair amount of detailed
17 area.

18 I accept that the root cause investigation
19 is a process that goes on, but we're looking at, I hope,
20 factual information for which you must have a lot of
21 factual information on this. My concern is that you're
22 developing a mine here without adequate geologic,
23 geotechnical, hydrogeologic knowledge and when these
24 events like this one, or the one at McArthur River take
25 place, they put the workers in considerable jeopardy.

1 It's an issue of safety of the workers.

2 And so Cameco as a company, I think in
3 which we expect to present to have done the appropriate
4 geological, hydrogeological engineering work and to be
5 designing and operating a mine with full competence. And
6 we know this, certainly from the McArthur River
7 experience, which was referred to earlier in this
8 discussion, it begs the question and maybe you can answer
9 it. Knowing McArthur River, knowing that you have a wet
10 zone, knowing that you're mining just below a wet zone,
11 and therefore may have some penetration of waters like
12 this, why do you have a system that only has pumps that
13 can accommodate 500 cubic metres an hour?

14 **MR. NEUBURGER:** A few things -- first I'd
15 like to -- it's Dave Neuburger, for the record, I'm sorry.

16 First I'd like to offer to you that
17 absolutely you are correct that the schematic shows
18 faulting in the area, it shows the alteration in the area
19 of the ore zone, so we -- and that's what we're trying to
20 show with that schematic, that is an altered area, there
21 is faults in the area. The point we were trying to raise
22 in answer to your previous question was simply that we
23 don't know if there is a fault that exactly lines up with
24 that inflow area, but you're absolutely correct in saying
25 that, as you indicated before, that is representative of

1 faulting in the Athabasca sand stone, that point.

2 Secondly, you make reference to McArthur
3 River. We have, as you are well aware, I've had a tap
4 root of the McArthur River inflow a couple of years ago,
5 and we have applied lessons learned to McArthur River and
6 also to Cigar Lake. We had installed significant surface
7 storage capacity ponds for water storage that were in
8 place, I believe, an additional 90,000 cubic metre storage
9 in contingency pond. That was all subsequent to the
10 McArthur River tap root and the lessons learned.

11 We had the plans in place to be installing
12 additional pumping capacity to Cigar Lake, and I believe
13 that was part of the initial -- of the construction
14 package that was previously approved. The installation of
15 that pumping was in progress at the time and the obviously
16 looking in hindsight, we could have used it at the time of
17 the inflow, but the plans that were presented was that
18 pumping capacity would be in place before operation of the
19 mine began.

20 We have also incorporated more rock
21 mechanics expertise at both our sites and our corporate
22 level and additional oversight in that area since the
23 McArthur River inflow. We have a McArthur River rock
24 mechanics engineer. We have again, at Cigar Lake, an
25 engineer responsible for ground control and we have a

1 corporate rock mechanics engineer that provides a measure
2 of oversight to all of our mining operations.

3 We have also -- we make use of consultants
4 in that area for third party review as well, periodically.
5 And lastly, as Barry noted earlier, as Mr. Schmitke noted
6 earlier, we do have design standards that we've put in
7 place subsequent to the McArthur River inflow, both at
8 McArthur River and at Cigar Lake. That was one of the
9 recommendations that came out as well.

10 Then we also applied learnings from the
11 McArthur River inflow to the event, which, you know,
12 obviously most of the learnings we'd like to apply are to
13 avoid events such as this, but as Mr. Jarrell referred to
14 during his presentation, during the event we did apply
15 lessons learned in terms of the importance of significant
16 amount of radiation monitoring and the importance of
17 strong communication to many players throughout the
18 occurrence of the event and subsequent to it.

19 But we would be happy to provide a more
20 detailed cross section that isn't a schematic, a
21 subsequent review once we have done the tap root and
22 detailed technical investigation and should there be any
23 reviews intermediate to that.

24 **THE CHAIRPERSON:** Dr. Dosman, do you have
25 any questions?

1 **MEMBER DOSMAN:** Yes, Madam Chair. Thank
2 you.

3 I have several questions relating to health
4 and safety of the workers, and I'd just like to
5 reconstruct the events as they took place in the context
6 of the workers.

7 Am I right, Cameco, that you state that all
8 non-essential workers were evacuated, and do I take it
9 that there were 21, plus 3 workers that were left in the
10 mine to try and deal with the situation?

11 **MR. SCHMITKE:** Barry Schmitke, for the
12 record.

13 That is correct. We did not have
14 underground any workers that were not essential to the
15 remediation effort.

16 **MEMBER DOSMAN:** I'd just like to get a
17 sense of the safety case for the workers. I take it that
18 shaft number two is not yet in operation. Is shaft number
19 two also flooded?

20 **MR. SCHMITKE:** Barry Schmitke.

21 Shaft number two is not in operation. We
22 were in the process of drilling holes vertically upwards
23 to freeze number two shaft so that it could be completed;
24 and yes, it is also flooded.

25 **MEMBER DOSMAN:** What I'm trying to get at

1 is the sequence of events leading to the ultimate decision
2 to evacuate the workers and whether there was any risk to
3 the workers. How deep was the water at the bottom of the
4 lift when the decision was made to evacuate the workers?
5 And what was the timeline? How much time was left for a
6 safe evacuation?

7 **MR. SCHMITKE:** Barry Schmitke.

8 The sequence of events was that we
9 attempted to open the door and repair the seal on the
10 final time, and during that time, there was a sort of a
11 wave of water that came through the door. That wave of
12 water probably was in the neighbourhood of two to three
13 feet, probably up to a metre. And that water flows down
14 the drift towards number one shaft and it then goes two
15 ways.

16 It goes down the ramp to the 500 level and
17 it reports to the shaft station on the 480 level. And
18 then it runs down the shaft and it all ends up on the 500
19 level.

20 There was a minimum of two hours of storage
21 remaining below the 480 metre level and if required,
22 there's a man-way that goes between the 480 metre level
23 and the 420 metre level. The man-way which is essentially
24 a set of ladders. So if required, we could have taken and
25 instructed the workers to proceed to the 420 metre level,

1 allowed the 480 metre level to fill up with water and that
2 would have provided an additional 60 hours to evacuate the
3 workers.

4 **MEMBER DOSMAN:** So when the workers -- so
5 you say that there was potentially 60 hours of safety time
6 to get the workers out? Say in the event that the lift
7 had failed, how would the company have evacuated the
8 workers?

9 **MR. SCHMITKE:** Barry Schmitke.

10 Yes, that's correct. We had approximately
11 60 hours that we could have utilized to evacuate the
12 workers. At the mine site we have an emergency hoist that
13 we utilize for an event like this, which is independent of
14 the existing hoist.

15 It is mobile so we take and move it into
16 the head frame, near the shaft. It has a specially
17 designed bullet cage that connects to the guide ropes that
18 are used for the existing, the main cage and then that
19 would be utilized to rescue the workers from the mine.

20 That particular device, the emergency hoist
21 is tested annually and there is a rescue protocol that is
22 ran through, essentially an exercise that is done annually
23 also to ensure that that piece of equipment works. The
24 last practice that was done with the emergency hoist took
25 place on May 6th, of 2006.

1 **MEMBER DOSMAN:** Does the emergency hoist
2 have its own source of power separate from other sources
3 of power at the site?

4 **MR. SCHMITKE:** In accordance with the
5 Saskatchewan mines regulations, an emergency hoist has to
6 be powered separately from the existing hoist.

7 **MEMBER DOSMAN:** Madam Chair, I'd like to if
8 I may, pursue with several other questions concerning the
9 health and safety of the workers.

10 How much water were the -- what was the
11 depth of water that the workers were standing in, at the
12 time that the decision was made to lift them from the
13 site? Like for example, were their boots covered, and so
14 on?

15 **MR. SCHMITKE:** Barry Schmitke.

16 Not all of the workers were standing in the
17 water. There were workers who were at the bulkhead
18 themselves and then, there were workers who were
19 monitoring various other areas of the mine.

20 For instance, the three on the 420 level
21 didn't encounter any water.

22 Now, when the workers walked to the shaft
23 and the water was flowing down the shaft, they would have
24 been in water, probably slightly higher than their boots.

25 **MEMBER DOSMAN:** And did they have rubber

1 boots or would they have been wearing their regular boots,
2 their regular work boots.

3 **MR. SCHMITKE:** Barry Schmitke.

4 They would have been wearing rubber boots.

5 **MEMBER DOSMAN:** So they ---

6 **MR. SCHMITKE:** Up till just below their
7 knees.

8 **MEMBER DOSMAN:** Were there any of the
9 workers that suffered any health problems with their feet,
10 as a result of emersion or coldness or so on?

11 **MR. SCHMITKE:** Barry Schmitke.

12 There were some reports that the water was
13 cold and I know it's about plus seven degrees, I've been
14 in it myself, but there were no reported injuries as a
15 result of the incident.

16 **MEMBER DOSMAN:** And then with the -- tell
17 me about the counselling that took place later. It stated
18 that there was some worker counselling with regard to
19 stress and I wonder if you would be willing to describe
20 how that went and so on and how the workers responded.

21 **MR. ROGERS:** It's Terry Rogers, for the
22 record.

23 Dr. Dosman, the day after the event, Dave
24 Neuburger and I, actually the day of it, we flew to Cigar
25 Lake and the next morning we, Mr. Jarrell referred to it

1 in his presentation of meeting with the 24. So we had
2 this opportunity to debrief them, hear their story, hear
3 all of the -- you know, we sense that it was -- it had to
4 be a nervous time. The miners have a lot of pride in
5 trying to do their jobs very well.

6 So we had the meeting in the morning and,
7 during that presentation of these workers, they talked a
8 little about that, but there was no sense of panic, I
9 should say.

10 They were laudatory, in terms of their
11 praise for their fellow workers as well as their
12 supervisor, they're contract employees. And there was no
13 report of injury and really no report of any kind of
14 hypothermia or anything at that point.

15 Now, as far as the counselling is
16 concerned. The counselling was offered to the employees
17 in that session with our HR superintendent at Cigar Lake
18 and, to what extent they availed themselves of it, I can't
19 comment at this point, but we did talk about and had that
20 available to the contract employees, as well as our own.

21 **MEMBER DOSMAN:** However, the debriefing
22 session was with management, as opposed to a counsellor?

23 **MR. ROGERS:** It's Terry Rogers for the
24 record.

25 Yes, the debriefing session was facilitated

1 by the HR Superintendent, so he solicited the information
2 from the people.

3 **MEMBER DOSMAN:** Thank you. The SDR from
4 staff didn't quite slant it that way.

5 I'd like to ask staff in your view, at all
6 times did the company have the safety of workers as its
7 paramount objective in the attempted remediation and
8 subsequent evacuation?

9 **MR. SCISSONS:** It's Kevin Scissons.

10 It is our understanding with, not only of
11 the review of the incident, our onsite visit of October
12 26th and our interview with a number of the employees, the
13 management onsite and the contractors onsite that, that
14 was our understanding.

15 However, we did not interview every
16 employee and some of the reports have come out subsequent.
17 I'm also going to, if it may be appropriate, to pass this
18 on to Sask Labour as they've also conducted their own
19 parallel investigation, interviews and they have their own
20 process because we do tend to, of course, inter-harmonize
21 the approach of Sask Labour, look at them for convention
22 of health and safety issues, safety of the mine, mine
23 workings, emergency hoist, et cetera.

24 So I will, when it's appropriate, Madam
25 Chair, to suggest that they could intervene at this as

1 well.

2 But before, if you don't mind to go there,
3 we want to reiterate that we do look at these programs, we
4 did assess the overall safety of it and the contingencies
5 that were involved, including the flooding, in the event
6 of a flooding, about the different measures that would be
7 in place. And as a matter of fact, subsequent to the
8 Shaft No. 2 flooding, the increase in pumping capacity did
9 go up from 180 to 500 cubic metres an hour at the request
10 of CNSC staff, before the remediation efforts did go on.

11 We were fully aware of the plan to go up to
12 1,500 cubic metres per hour of pumping capacity, was on
13 the books to be done. The licensee had of course made
14 that commitment but had decided to implement that later on
15 in development as they stated, prior to going into
16 production.

17 We were very clear in our review of this,
18 that they were taking that risk themselves. However, we
19 had the fallback of looking at the overall health, safety,
20 environmental, and worker safety issues of contingencies,
21 emergency response and other programs in place to get the
22 workers out of the mine and we've maintained that that has
23 been adequate for them to continue this work.

24 So, the risks that were taken in this
25 development of the project were done by the operator and

1 within the approved procedures and programs, associated
2 with the licensed activity.

3 **MEMBER DOSMAN:** Madam Chair, it's my
4 understanding that Saskatchewan Labour has representatives
5 onsite in Saskatoon and perhaps Dr. Becker, others, and I
6 would appreciate their view, your view. I don't know if
7 you can hear me in Saskatoon. I would appreciate your
8 view as to the adequacy of the protection of the health
9 and safety of the workers in the attempted remediation and
10 subsequent evacuation from the mine.

11 **DR. BECKER:** Hi, Earnie Becker from
12 Saskatchewan Labour. I assume you can hear me.

13 Yes, we have interviewed some of the
14 workers and in addition we were in close contact with
15 Cameco personnel throughout the emergency and they
16 described the various steps they were taking throughout
17 their attempts to fight the flood, to ensure the safety of
18 workers.

19 The workers that we spoke to certainly said
20 that they got cold during their remediation attempts,
21 although the water was largely below the level of the top
22 of their rubber boots, it was flowing pretty rapidly and
23 so it was splashing up. A number of workers said they
24 were quite cold.

25 There was no indication of any other

1 injuries and obviously an event of this sort is quite
2 undesirable and it had to be a nervous time for everyone.

3 **MEMBER DOSMAN:** Madam Chair, I'd like to
4 ask Dr. Becker specifically, if he's aware of whether any
5 of the workers requested medical attention for emersion
6 foot or any other subsequent sequelly of standing in the
7 cold water?

8 **DR. BECKER:** I'm not aware of any reports
9 of injuries, no lost time accidents. If there were some
10 minor first-aid applied, it's possible but I'm not aware
11 of it.

12 **MEMBER DOSMAN:** Thank you very much.

13 **THE CHAIRPERSON:** Mr. Harvey, do you have
14 any questions?

15 **MEMBER HARVEY:** Merci Madame la Présidente.

16 In your presentation, you stated that the
17 water had low-radium content. Can we think that, if the
18 water stays there for a few months, that this radium
19 content could increase and if it's so, could it change the
20 approach or the rate of pumping or the options to get rid
21 of the water?

22 **MR. JARRELL:** John Jarrell, for the record.

23 It's a good question, we're not sure of.
24 You see what we'll have to do is treat the water, treating
25 for radium is, of course, a conventional part of the

1 treatment. So, our anticipation would be that we would
2 not discharge water, which did not meet the discharge
3 objectives.

4 **MEMBER HARVEY:** You also said that there
5 was no environmental impact because you had, I suppose,
6 adequate surface storage. Will that surface storage be
7 large enough to take all the water coming from the
8 pumping, when you start to pump or to ---

9 **MR. SCHMITKE:** Barry Schmitke.
10 Our intention to utilize the surface
11 storage has not been totally complete. What we're
12 planning on doing is, putting together the submission for
13 dewatering which will identify how we will dewater the
14 mine and how the treatment process will be utilized.

15 We certainly have adequate storage on
16 surface for the volume that we have in the mine.

17 Now, of course when we start to dewater the
18 mine, if the plug that we put in place allows some water
19 to come through then that will be in addition to what is
20 already in the mine. But our intention is to put that
21 through our treatment process and release water in
22 accordance with our licence conditions.

23 **MEMBER HARVEY:** Thank you.

24 **THE CHAIRPERSON:** Dr. McDill, do you have
25 any questions?

1 **MEMBER MCDILL:** Thank you, I have several.
2 At the beginning, I believe, Mr. Schmitke,
3 you said you hadn't intended to, I assume, do geological
4 drilling at the 465 level but until the freeze wall was in
5 place but you went ahead because some previous testing had
6 been successful.

7 Did I hear you say that correctly or did I
8 misinterpret you?

9 **MR. SCHMITKE:** Barry Schmitke.
10 I'm sorry, I'm not quite sure of the
11 question.

12 **MEMBER MCDILL:** At the beginning when you
13 were giving a history you said that at the 465 level you
14 hadn't intended to do ---

15 **MR. NEUBURGER:** It's Dave Neuburger, for
16 the record.

17 I believe what you're referring to, there
18 was a comment that the development below the ore zone on
19 465 is planned to be done through frozen ground. But the
20 development on 465 that accesses where the development
21 below the ore zone will start was -- had been done during
22 the test mine phase in unfrozen ground and was planned to
23 continue to be done on frozen ground.

24 I could demonstrate this perhaps, if we can
25 get this slide up for a second.

1 So what we will be doing for production,
2 the plan is to develop crosscuts through this type of
3 cross section. There will be a number of parallel
4 crosscuts that will be underneath the ore and the jet
5 boring will be developed from those crosscuts.

6 Those crosscuts which cross through the
7 more altered ground that we know to exist in the vicinity
8 of the ore zone, the plan has been to develop those
9 through frozen ground.

10 The development off to the south here which
11 runs into the plain of the cross section of this cross
12 sectional schematic has been done. There's an amount of
13 it that was done during the test mine phase in unfrozen
14 ground and it was planned to be continued to be developed
15 in unfrozen ground.

16 **MEMBER McDILL:** Thank you for that
17 clarification.

18 My second question is with respect to your
19 figure where you show the back with ruffles and some
20 screening and there's a -- I think it's a picture with
21 four on the same page, sequence of failure slide.

22 In the number 1 there's a, it looks like
23 red paint, had that been indicated by someone as a
24 potential area and perhaps you could discuss whether
25 there's sufficient roof support.

1 **MR. SCHMITKE:** Barry Schmitke.

2 You'll notice that there's some screen,
3 rock bolts and other ground support, shot creed on the
4 back. Typically what happens is when the miners find
5 cracks or things like that they'll take spray paint and
6 highlight them so that we can see if they're growing or
7 increasing in size and things like that.

8 So that would have either been done by the
9 ground control engineer or potentially one of the miners.

10 **MEMBER McDILL:** So was there any -- I guess
11 you'll find this in your root cause analysis. Was there
12 any evidence of that crack growing?

13 **MR. SCHMITKE:** Barry Schmitke.

14 The failure occurred rather quickly so it's
15 difficult to say that.

16 **MEMBER McDILL:** And my other question
17 relates to the bulkhead. Perhaps you could tell me what
18 your testing procedures for the bulkhead were and whether
19 there had been any contingency preparation for build up of
20 debris at the bulkhead.

21 **MR. SCHMITKE:** Barry Schmitke.

22 The bulkhead itself is test closed annually
23 and this particular bulkhead was test closed on January
24 the 8th, 2006.

25 Also, there is checks done on it and it was

1 actually checked that day, the seal was checked that day.

2 You'll notice that in front of the bulkhead
3 there is a bridge that has to be removed and the bulkhead
4 itself goes below the floor level and the accumulation of
5 debris, the water has to come down into that sump or the
6 area in front of the bulkhead and that is where the debris
7 collected during the incident.

8 **MEMBER McDILL:** But during your development
9 had you anticipated debris collecting there? Was there
10 any contingency planning for debris collecting?

11 **MR. SCHMITKE:** Barry Schmitke.

12 It's something that we had considered but
13 we just -- we probably did not look at in the light of the
14 effect that it would have on the seal.

15 **MEMBER McDILL:** Thank you. I don't know if
16 staff wants to comment on anything.

17 **THE CHAIRPERSON:** Final comment? One last
18 question from Dr. Barnes and then we'll roll this one up.

19 **MEMBER BARNES:** Well a comment, I had two
20 or three here but. I have real concerns about the
21 situation and I think, to my way of thinking, in order to
22 mine a complex deposit like this under the conditions that
23 we've been talking about, it would be essential, in my
24 view, to have a team of specialists that understood the
25 degree of complexity and that would involve geologists,

1 hydrogeologists, mine engineers, your technical people and
2 so on.

3 From what Cameco said we hired rock
4 mechanics, people who provide rock mechanics that don't
5 necessarily understand things like stratigraphy or the
6 local geology or hydrogeology.

7 There are many different kinds of breeds of
8 engineers and breeds of geologists and you have known
9 properties here, as you do throughout this uranium mining
10 in northern Saskatchewan and I think -- with this failure
11 and the one at McArthur River which are just, I think,
12 hugely significant, both economically but in terms of
13 health and safety as well as the environment since this
14 water has to come out on the surface.

15 It's absolutely essential that these
16 occurrences do not occur like this. And so, I think it's
17 essential from my viewpoint, that staff, when they're
18 looking at their records does an analysis of the kind of
19 specialization, the team of people that have been working
20 on this issue and find out the backgrounds, find out their
21 contribution, find out the process of decision making in
22 this and I would also urge that when staff does it, it
23 makes sure it has an appropriate array of specialists in
24 its armoury to make that analysis, otherwise ---

25 That's my comment.

1 **THE CHAIRPERSON:** Thank you.

2 One of the questions that certainly came up
3 to us during the previous issues that we had was adequate
4 communication between the licensee and the staff.

5 So I'm first of all going to ask staff if
6 they conclude that the communication from Cameco on this
7 event was sufficient and adequate.

8 **MR. SCISSONS:** Kevin Scissons.

9 Yes, the communication was adequate.
10 Though the event actually unfolded in less than 22 hours
11 so we had a number of communications systems set up,
12 including the follow-up inspection onsite.

13 Overall, yes, we were well informed. The
14 harmonized regulatory group was well informed, both
15 provincially, with Sask Labour and Sask Environment
16 ourselves. So that component of it, yes, we were in touch
17 and aware as things unfolded.

18 **THE CHAIRPERSON:** Does Cameco have any
19 comments with regards to communications with regulatory
20 authorities on this event? Lessons learned, comments?

21 **MR. ROGERS:** It's Terry Rogers, for the
22 record.

23 And I'll start, if others want to join in
24 but certainly from -- we think that the communication with
25 the regulator, initial notification was timely and ongoing

1 communication was done in a manner that kept all of our
2 regulators apprised of the situation.

3 I guess as far as the specifics and what
4 form it takes or how well documented it is, and the others
5 can comment about it but I do believe that every
6 reasonable attempt was made to ensure sufficient
7 communication with all of the regulators.

8 **THE CHAIRPERSON:** But my question -- sorry,
9 Mr. Rogers, was the other way too. I mean, sometimes
10 you'll need approvals from regulators or whatever and you
11 know, were they available when you needed to talk to them
12 with regards to permission to do various things or
13 whatever. Were they available to ---

14 **MR. ROGERS:** It's Terry Rogers, for the
15 record.

16 What was reported to me, yes, Madam Chair,
17 that was the case that regulators were not only well
18 informed by us but were advising us as to what steps may
19 be appropriate next to take and especially as it relates
20 to -- I mean, this is kind of post the event but --
21 working through the first phase of this remediation plan
22 has been particularly effective and for us has been an
23 excellent series of correspondences and then approvals to
24 proceed with the remediation.

25 John, you want to add anything?

1 **MR. JARRELL:** Yes, I'd tend to agree. I
2 think what we essentially did this time was I think,
3 followed the model we used at McArthur River, which I
4 think proved quite successful.

5 There is a risk, obviously in this, because
6 it's sort of live TV in a way insofar as the situation is
7 evolving very quickly. What we learned, I think at
8 McArthur, we applied here which is to provide the
9 information as soon as we could, what we knew, with the
10 understanding that of course, the situation will change
11 obviously, as we learn more. As Terry said, this occurred
12 very quickly.

13 In terms of making the decisions that are
14 required, I think that's worked quite well, so I think
15 this whole sort of approach we took of involving sort of
16 the four main regulators, having regular teleconferences.
17 I think that was proved yet again, a very effective
18 approach to this.

19 **THE CHAIRPERSON:** Well, I think that my
20 colleagues have voiced I think, their concerns about this
21 and I think that the timeliness of the updates to the
22 Commission will be important from both the licensee and
23 from the staff, as well. I think what -- we'll make
24 arrangements to make sure we have adequate time to discuss
25 this as thoroughly as we need to.

1 What I heard the Commission members say
2 though, is as much as we need to do a root cause on this
3 particular event, looking at the fact that it could very
4 well be that there is other mines in this general area, in
5 Saskatchewan, that there could be new mines coming on
6 stream; that there has to be some serious lessons learned
7 as well as to -- if speed has become more important than
8 care, we have to all acknowledge that and go back into
9 looking at this seriously.

10 So I think we'll be very interested in the
11 root cause of this event but we'll also look forward to
12 the industry giving assessments as to what would this lead
13 you to think about further areas or other mines or et
14 cetera. So it's lessons learned.

15 So thank you very much.

16 We're just going to sort of get a five
17 minute up and down while we allow people to switch chairs.

18 Thank you.

19
20 --- Upon recessing at 3:22 p.m

21 --- Upon resuming at 3:27 p.m.

22 **THE CHAIRPERSON:** Could we ask the
23 personnel from Bruce Power to come up, please.

24 The next item on the agenda is 4.1.2, which
25 is Unit 8 Bruce Power, Contamination Found on Material

1 Released on an Unconditional Transfer Permit. This is a
2 new item. We have the written information.

3 Mr. Grant, is there any updates you'd like
4 to give us?

5

6 **06-M58**

7 **Unit 8 Bruce Power Nuclear**

8 **Generating Station B -**

9 **Contamination Found on**

10 **Material Released on an**

11 **Unconditional Transfer Permit**

12

13 **MR. GRANT:** Thank you, Madam President.
14 For the record, Ian Grant, Director
15 General, Power Reactor and Regulation.

16 There's a little bit of additional
17 information since you received the report from Bruce Power
18 on October 20th, pursuant to the condition of the licence
19 of the release of 125 nanocuries of radiation, is a very
20 small quantity.

21 Mr. Desjardins, the Regulatory Program
22 Officer will provide a brief update.

23 **MR. DESJARDINS:** Daniel Desjardins.

24 The licensee reported this event to us
25 pursuant to S-99 under a clause 6313, which is non-

1 compliance with licensee-produced documents. To put it in
2 context, I discussed this with staff in the Radiation
3 Protection Division and the 125 nanocuries is actually
4 well below regulatory exemption quantities.

5 Thank you.

6 **THE CHAIRPERSON:** Any comments from Bruce?

7 Mr. Nixon? Mr. Saunders?

8 **MR. NIXON:** For the record, my name is
9 Robert Nixon. I'm the Chief Nuclear Officer of Bruce
10 Power.

11 I'd like to just summarize the actions that
12 we took following this event.

13 First of all, I'd like to assure the
14 Commission that we take this event very seriously. My
15 expectation is that there will be no unplanned activity
16 shipped off our site, regardless of how low the level or
17 well contained, as was in this case.

18 The actions that we took; we suspended all
19 shipments immediately we were notified of the issue, we
20 arranged for the immediate return of the material from
21 Millstone, we determined the extent of condition, both for
22 the specific shipment under/over all processes and then
23 follow-up. We have stopped unconditional transfer of
24 high-risk material. By that I mean material such as
25 equipment or tools, as in this case, that are used -- have

1 been used on radioactive systems work.

2 We have simplified the transfer process. I
3 mean, I only use a conditional radioactive transfer for
4 items such as this; the reason being that it's less error-
5 prone because it is simpler.

6 We also had a look at the human performance
7 issues and there were some of them. We removed the
8 qualifications from the technicians involved until they
9 had been retrained. Following the training, we
10 interviewed them individually to determine their
11 understanding and competency. One of them was not re-
12 qualified following that.

13 There was also coaching of the supervisors
14 on expectations in relation to the thoroughness of
15 surveying, et cetera, on equipment.

16 So that completes my comments and I'll be
17 pleased to answer any questions you may have.

18 **THE CHAIRPERSON:** Thank you very much, Mr.
19 Nixon.

20 Are there any questions from Commission
21 members?

22 Yes, Dr. Barnes.

23 **MEMBER BARNES:** Do you know if this had
24 happened in the past?

25 **MR. NIXON:** We have had an incident in the

1 past, in the late '90s, when we had some material shipped
2 offsite. After that, we did install extra monitoring and
3 including the truck monitor on the site exit.

4 However, that particular case for this
5 particular monitor, it would not have found this
6 particular case because the material was inside boxes and
7 ---

8 **MEMBER BARNES:** Yes, I'm just referring to
9 this kind of material. It was picked up because it was
10 registered at its eventual site. Correct?

11 **MR. NIXON:** That's correct. No, we haven't
12 had ---

13 **MEMBER BARNES:** Which had a monitor but
14 some of the material that would be sent offsite, would it
15 all go to a site that had such a monitor?

16 **MR. NIXON:** This type of material would,
17 because it is material that is used on nuclear sites by
18 this particular company or these types of companies.

19 **MEMBER BARNES:** Okay. Thank you.

20 **THE CHAIRPERSON:** Any further questions?

21 Well, thank you very much for coming.

22 Oh, sorry. Oh, Dr. McDill, I apologize.

23 **MEMBER McDILL:** Thank you.

24 In the interests of encouraging people to
25 report accidents, the individual who was not re-qualified;

1 does that individual feel the -- was it a punitive thing?
2 Is it going to change the culture in the staff?

3 **MR. NIXON:** No, I don't believe so. I
4 can't answer specifically for the individual, but we do
5 have clear expectations in our qualification processes,
6 all of our qualification processes; that we expect people
7 to perform. So it's not uncommon for us when we interview
8 people, either on a routine basis to determine whether or
9 not we do believe they're competent. That's part of our
10 process. And if they're not deemed to be competent, then
11 we don't qualify them or re-qualify them.

12 **MEMBER MCDILL:** Does staff want to comment
13 on that?

14 **MR. GRANT:** Ian Grant, for the record.
15 Staff haven't followed up with the
16 individual in question but we believe that the comments by
17 the licensee with regard to the qualification process are
18 correct and they're appropriate.

19 **THE CHAIRPERSON:** Dr. Dosman.

20 **MEMBER DOSMAN:** Thank you, Madam Chair.

21 I'd like to ask the company; is there not
22 some type of protocol in place to scan items going out or
23 some regular means to prevent this kind of occurrence?

24 **MR. NIXON:** Yes, there are processes and
25 procedure we have defined, including the types of scanning

1 equipment that are expected to be used. In this case the
2 equipment was used. It was not -- all of the right
3 equipment wasn't used and it wasn't used appropriately.
4 Sometimes these pieces of equipment are quite convoluted
5 in their physical shape and you do have to use the right
6 equipment with the right diligence in order to be sure
7 that you find anything, particular these very low levels.

8 **MEMBER DOSMAN:** Madam Chair, may I?

9 I take it that there were two errors then,
10 one in the packing and one in the leaving the facility?

11 **MR. NIXON:** No, the error occurred in the
12 final surveying before the equipment was packed.

13 **MEMBER DOSMAN:** Thank you.

14 **THE CHAIRPERSON:** Thank you very much for
15 coming.

16 We'll now move to the next item. C'est
17 numéro 4.1.3 Alerte sectorielle à Gentilly-2. C'est
18 aussi sous la responsabilité de Monsieur Grant.

19 Est-ce qu'il y a des commentaires
20 additionnels, Monsieur Grant?

21
22 **06-M58.A**

23 **Alerte sectorielle à Gentilly-2**

24
25 **MR. GRANT:** Merci, madame la Présidente.

1 Non, il n'y a pas de renseignements
2 supplémentaires à ajouter.

3 **THE CHAIRPERSON:** Est-ce qu'il y a des
4 questions à part des commentaires concernant la question à
5 Gentilly-2?

6 Non? Merci beaucoup, Monsieur Grant.

7 Mr. Grant, you're there for the next item
8 too which is the CMD 06-M59 which is the Status Report on
9 Power Reactors. Are there any updates which you'd like to
10 add to the report that we have in front of us?

11

12 **06-M59**

13 **Status Report on Power Reactors**

14

15 **MR. GRANT:** Thank you, Madam President.

16 No updates. The report stands.

17 **THE CHAIRPERSON:** Are there any questions?

18 Yes, Dr. Dosman.

19 **MEMBER DOSMAN:** Thank you.

20 With regard to Pickering A, I'd like to ask
21 whether the generator cooling issues have been solved, to
22 the knowledge of staff.

23 **MR. GRANT:** Dr. Dosman, I regret that I
24 can't answer the question. I'll provide an update as soon
25 as I do consult with the relevant staff.

1 come to the front, and Mr. Howden.

2 The next three items on the agenda which is
3 4.3.1, 4.3.2, are the CMDs 06-M62, 63 and 63A which is a
4 midterm status reports on Atomic Energy of Canada
5 Limited's MAPLE Reactors and the new processing facility.

6 As these installations share similar
7 programs the reports will be presented together. I will
8 start with the report from CNSC staff as to the mid-term
9 report and then we will turn to AECL for their comments.

10 Mr. Howden, you have the floor, sir.

11

12 **06-M62/06-M63/06-M63.A**

13 **Mid-Term Status Reports**

14

15 **MR. HOWDEN:** Thank you.

16 Madam Chair, Members of the Commission, for
17 the record, my name is Barclay Howden. I'm the Director
18 General of the Directorate of Nuclear Cycle and Facilities
19 Regulation.

20 With me today are Mr. Miguel Santini,
21 Director of the Chalk River Laboratories, Compliance and
22 Licensing Division; Mr. Bruce Pearson, CNSC Project
23 Officer for the MAPLE Reactors, and the rest of the CNSC
24 team for this facility.

25 CNSC staff has prepared a mid-term report

1 on AECL's MAPLE Reactors consistent with CMD 02-M12 and
2 the Commission's Record of Proceedings, including Reasons
3 for Decision dated November 24, 2005.

4 CNSC staff has prepared the mid-term report
5 to present a status report to the Commission on the
6 commissioning activities and on the performance of the
7 facility over the first half of the licence term.

8 I will now pass the presentation over to
9 Mr. Pearson who will provide the update on the MAPLE
10 Reactors.

11 **MR. PEARSON:** Thank you. Good afternoon,
12 Madam Chair and Members of the Commission.

13 For the record, my name is Bruce Pearson,
14 CNSC Project Officer for the MAPLE Reactors.

15 CMD 06-M62 provides CNSC staff's update to
16 the Commission on the status of commissioning activities
17 for the MAPLE Reactors and on the performance of the
18 facility at the approximate midpoint of the current
19 licence period.

20 Today's presentation consists of six parts:
21 first a brief introduction; second, a summary of the
22 follow-up activities to the 2005 licence renewal hearing
23 for the MAPLE Reactors; next, an overview of the
24 compliance activities carried out since the licence was
25 issued on November 30, 2005; fourth, the status of

1 improvements to those regulatory programs that did not
2 fully meet regulatory requirements at the time of licence
3 renewal; next, other relevant information for the
4 Commission to consider and; finally, CNSC staff's
5 conclusions regarding AECL's performance for the MAPLE
6 Reactors.

7 Pursuant to Section 24 of the *Nuclear*
8 *Safety and Control Act* AECL was issued a non-power reactor
9 operating licence for the MAPLE Reactors, valid for a two-
10 year period, from December 1, 2005 to November 30, 2007.

11 In its Record of Proceedings, including
12 reasons for decisions in the matter of licence renewal for
13 the MAPLE Reactors, the Commission requested that CNSC
14 staff present a status report on the commissioning
15 activities and on the performance of the MAPLE facility
16 over the first half of the licence term.

17 The mid-term status report submitted as CMD
18 06-M62 covers the review period from November 2005 to
19 November 2006.

20 Since the time of the MAPLE Reactor licence
21 renewal CNSC staff has focused its efforts in two areas.
22 Monitoring progress in licensee actions to address
23 weaknesses in the implementation of programs in the areas
24 of operating performance, performance assurance, and
25 environmental protection and evaluating progress made in

1 commissioning and in resolving the licensing issues that
2 were outstanding at the time of the licence renewal.

3 Since staff uses a combination of Type 1
4 and Type 2 compliance inspections and desktop reviews of
5 AECL documents to assess MAPLE Reactor operational
6 compliance with the *Nuclear Safety and Control Act*, its
7 regulations, the conditions of the MAPLE Reactor operating
8 licence and all levels of AECL's own documentation.

9 During the first half of the current
10 licence period CNSC staff carried out inspections to
11 verify the results of a root cause assessment performed to
12 address shortcomings in an original submission of the
13 safety case developed to support 2 kilowatt operation of
14 the MAPLE-1 Reactor and to observe the performance of key
15 safety related activities, including reloading of fuel
16 into the MAPLE-1 reactor core, testing of a design change
17 to the MAPLE-1 control absorber rods and restarting the
18 MAPLE-1 reactor.

19 In addition, CNSC staff carried out a
20 number of desktop reviews in response to AECL requests for
21 approval under licence conditions.

22 Such reviews include those required for
23 approval of design changes to target cluster holders,
24 approval of modifications to documents, such as the
25 operational limits and conditions document referenced in

1 Appendix "B" of the licence, and approval for operation of
2 the MAPLE-1 Reactor at 2 kilowatts and 5 megawatts.

3 As indicated in the CMD, AECL's application
4 for approval to operate at 5 megawatts is still under
5 review by staff.

6 Based on its compliance activities during
7 the licence period to date, CNSC staff concludes that
8 except for certain deficiencies or non-conformances
9 identified in CMD 06-M62, AECL operated the MAPLE reactors
10 in compliance with regulatory requirements.

11 However, as indicated at the time of
12 licence renewal, CNSC staff will maintain an enhanced
13 regulatory vigilance and oversight until AECL's overall
14 performance for the MAPLE reactors further improves.

15 As indicated previously, CNSC staff efforts
16 over the first half of the current licence term have
17 focused on AECL's progress in addressing weaknesses in the
18 implementation of programs in the operating performance,
19 performance assurance and environmental protection safety
20 areas. In order to address weaknesses in the operating
21 performance, AECL developed a Continuous Improvement
22 Program.

23 Although AECL has now completed the
24 majority of actions in the plan, there are still signs
25 that the measures taken may not have been fully effective.

1 Such indicators include repeat occurrences of known
2 problems, no observable change in the number of human
3 error events being recorded, use of an unapproved document
4 and failure to comply with submission requirements of the
5 Operational Limits and Conditions Document.

6 Based on this evidence, CNSC staff has
7 concluded that implementation of the programs and the
8 operating performance safety area should continue to be
9 rated as "below requirements".

10 With regards to the performance assurance
11 safety area, and in particular quality assurance, AECL has
12 made substantial progress in resolving the deficiencies
13 identified in the commissioning quality assurance audit of
14 2003. CNSC staff is of the opinion that any of the
15 residual issues still outstanding will not pose an
16 unreasonable risk to the upcoming commissioning
17 activities.

18 For the Dedicated Isotope Facilities
19 Operations Quality Assurance Audit, performed in 2005,
20 there still remains a number of actions that must be
21 completed before the audit can be closed. However, CNSC
22 staff is cautiously satisfied with the progress to date
23 and expects AECL to be able to complete the remaining
24 improvements within the next year.

25 As indicated in CMD 06-M62, CNSC staff

1 conducted follow-up activities on the "C" rating given to
2 implementation of the Environmental Protection Program at
3 the time of licence renewal. As a result of these
4 activities, the rating has been upgraded to a "B" level as
5 CNSC staff is of the opinion that AECL now meets
6 regulatory requirements in this area.

7 In the past, Commission Members have
8 expressed concern with the effectiveness of communications
9 between AECL and CNSC staff on the MAPLE project. To
10 address these concerns, AECL staff and CNSC staff have
11 enhanced the level of communication. In the technical
12 area, 28 meetings have been held since the licence renewal
13 to facilitate understanding of technical issues and to
14 better communicate CNSC staff expectations for resolution
15 of the technical issues.

16 Monthly meetings are held at the staff
17 level to review progress in resolving the outstanding
18 licensing issues and monthly meetings are held to keep
19 senior management aware of continuing progress made on
20 licensing issues and to keep them informed of any emerging
21 licensing issues that may arise.

22 With regards to commissioning
23 activities, AECL has made considerable progress in
24 resolving the weaknesses in the Non-Nuclear Commissioning
25 Program and CNSC staff is regularly kept informed of

1 progress during weekly commissioning progress
2 teleconferences.

3 As stated previously, AECL received
4 approval to operate the MAPLE 1 reactor at two kilowatts.
5 This approval was granted on April 28th, 2006 and the
6 MAPLE 1 reactor was operated at two kilowatts during the
7 months of July and August of 2006. At present, the MAPLE
8 1 reactor is shut down to complete activities identified
9 as "prerequisites for five megawatt operation" and the
10 MAPLE 2 reactor remains in the guaranteed shutdown state.

11 Based on the regulatory activities carried
12 out since the licence renewal in 2005, CNSC staff has
13 concluded that AECL has operated the MAPLE reactors in
14 overall compliance with the CNSC's regulatory requirements
15 and performance expectations and that the continued
16 operation of the MAPLE reactor should not pose an
17 unreasonable risk to the health and safety of persons, the
18 environment and national security.

19 This concludes my presentation. I will now
20 return the floor to Mr. Howden.

21 **MR. HOWDEN:** Thank you, Madam Chair.

22 This concludes our presentation with
23 respect to the MAPLE update and staff is available to
24 respond to questions.

25 **THE CHAIRPERSON:** Mr. Howden, I understood

1 that you were going on to the New Processing Facility and
2 do them both together.

3 **MR. HOWDEN:** Yes, we'll just have to flip
4 the slides here. It will just take a moment.

5 Madam Chair, Members of the Commission, for
6 the record again, I'm Barclay Howden. With me today are
7 Mr. Miguel Santini, as I previously introduced, and
8 immediately behind me is Mr. Etienne Langlois, Project
9 Officer for the New Processing Facility.

10 When renewing the Nuclear Substance
11 Processing Facility Operating Licence last year for the
12 period of December, 2005 to November, 2007 the Commission
13 requested in its records of proceedings including reasons
14 for decisions dated November 24th, 2005, that CNSC staff
15 presented the Commission a status report on the
16 commissioning activities and on the performance of the
17 facility over the first half of the licence term.

18 I will now turn over the presentation to
19 Mr. Langlois, who will outline this for you.

20 **MR. LANGLOIS:** For the record, my name is
21 Etienne Langlois.

22 CNSC staff has prepared CMD 06-M63, which
23 presents the Commission the requested status report for
24 the NPF.

25 This short presentation will provide some

1 background information by updating the information given
2 in CMD 05-H21 that was prepared for the licence renewal.
3 This will be done by first giving some general background
4 information, then summarizing the status of the NPF with
5 respect to its inactive and active commissioning and
6 finally presents CNSC staff's conclusions.

7 AECL's New Processing Facility and the
8 Chalk River Laboratories, together with the two MAPLE
9 Reactors, makes up the dedicated isotope facilities. The
10 purpose of the NPF is to extract radioisotopes for use in
11 medicine from targets irradiated in the MAPLE reactors.

12 Being part of the Chalk River Laboratories,
13 a number of areas in the operation of the facility are
14 covered by site programs and, furthermore, being part of
15 the dedicated isotope facilities, much of the remaining
16 activities are covered by DIF procedures.

17 In November, 2005 the Operating Licence for
18 the New Processing Facility at the Chalk River
19 Laboratories was renewed by the Commission for a period of
20 24 months, ending November 30th, 2007. As stated during
21 the licence renewal hearing, AECL was planning to
22 accomplish the following during the period of this
23 licence.

24 First, complete the ongoing inactive work
25 on the various NPF systems, then perform the active

1 commissioning of the facility and, finally, have the
2 facility declared in service and start routine production
3 of medical radioisotopes.

4 Conditions in the NPF licence introduced
5 two hold points between these activities, thus providing
6 regulatory control by ensuring that the issue was still
7 open when the hold point is released do not pose
8 unreasonable risk.

9 First, regarding the completion of the
10 ongoing inactive work: Inactive commissioning of the NPF,
11 which is a commissioning of the facility systems without
12 using radioactive material, was performed by AECL in 2000
13 and the AECL provided in 2002 an inactive commissioning
14 completion assurance. A series of tests called "The NPF
15 Inactive Integrated Testing" was done in 2003 and produced
16 a number of findings.

17 AECL is currently still performing inactive
18 work on NPF systems to address these findings and to
19 improve the operability of the facility. AECL plans to
20 complete this work during the period of their current
21 licence. The most significant work currently ongoing is
22 the redesign of two major waste handling systems, the
23 calcination and the cementation systems.

24 The next step for AECL is to proceed with
25 the active commissioning of the NPF. Approval to start

1 active commissioning of the NPF was given in May, 2003
2 following AECL's inactive commissioning completion
3 assurance. This approval was conditional on the
4 completion of a number of items. These were the
5 activities for which agreement had been reached, that they
6 would resolve their various issues remaining prior to
7 allowing the start of the active commissioning, but
8 activities which had not yet been completed.
9 Verification of the completion of these conditions will be
10 done before -- at least authorized to start the active
11 commissioning of the NPF. It should also be remembered
12 that the start of the NPF active commissioning depends on
13 the MAPLE Reactor operating at powers sufficiently high to
14 irradiate targets for processing in the NPF.

15 AECL still plans to start the active
16 commissioning of the NPF during the period of the current
17 licence. However, the target date for this activity is
18 now October 2007 as opposed to December 2006, as given at
19 the licence renewal.

20 Finally, as for the conclusions, the other
21 activities that AECL was originally planning to perform
22 during the current licence period, such as completing the
23 work necessary to have the NPF declared in-service and
24 starting the routine production of medical radioisotopes
25 will now occur after November 2007 and thus after the next

1 licence renewal.

2 Since AECL is still completing non-
3 radioactive work, the radiological risks currently
4 associated with the NPF are negligible, and the doses to
5 workers and to the public, as well as the releases to the
6 environment are all well below regulatory limits.

7 CNSC staff concludes therefore that AECL,
8 in the new processing facility, is making adequate
9 provisions for the protection of the environment, health
10 and safety, security and Canada's international
11 obligations.

12 Thank you, Madam President; this concludes
13 my presentation.

14 **MR. HOWDEN:** Madam Chair, Barclay Howden
15 speaking.

16 That completes both presentations and we're
17 ready to respond to questions.

18 **THE CHAIRPERSON:** Thank you. We'll now
19 then turn to the oral presentation by Atomic Energy of
20 Canada Limited, as noted in CMD documents 06-M62.1, 06-
21 M63.1 and I will turn the floor over to Mr. Brian McGee.
22 Mr. McGee, you have the floor, sir.

23

24 **06-H62.1, 06-M63.1**

25 **Oral presentation by**

1 **Brian McGee**

2

3 **MR. MCGEE:** Thank you and good afternoon,
4 Madam Chair, Members of the Commission.

5 For the record, I am Brian McGee, Vice
6 President of AECL Nuclear Laboratories.

7 I am accompanied here today by, on my left,
8 Mr. Ron Cullen, Vice President of Projects, and on my
9 right, Mr. Don Taylor, Director of the Dedicated Isotope
10 Facilities. As well, we have brought along some key
11 members of AECL's team who have been working on this very
12 important project.

13 We recognize that the Commission's request
14 was for an update, a mid-term update from staff so we
15 appreciate the opportunity to make a brief verbal
16 presentation to you today and we will focus our update on
17 the dedicated isotope facilities, particularly the
18 commissioning progress that we have made during the first
19 half of the current licence period for these facilities.
20 And we'll go on further to describe our future operation,
21 our path towards future operation of the facilities.

22 The dedicated isotope facilities consist of
23 the MAPLE One and MAPLE Two reactors, the MAPLE One iodine
24 production facility and finally the new processing
25 facility.

1 I will also summarize the actions we've
2 taken to improve the operating performance of the facility
3 during that first half of the licence period.

4 I will address the following topics in my
5 presentation: ownership and project schedule, operating
6 improvements, technical progress and the path forward,
7 communications with the CNSC, and I'll close with a brief
8 summary.

9 Following our contractual agreement
10 finalized between MDS Nordion and AECL in February of
11 2006, AECL became the sole owner and operator of the
12 dedicated isotope facilities. As part of this new
13 contract, AECL is committed to producing isotopes from the
14 facility by October of 2008. AECL is ensuring that all
15 work carried out is done with the utmost focus on public
16 safety, environmental protection and safe working
17 practices.

18 During the first half of the current
19 licence period, we have made a number of changes to
20 improve the safety and quality of operations.
21 Organizational changes have been made in both the
22 dedicated isotope facilities and the MDS Nordion Medical
23 Isotope Reactor Project.

24 The dedicated isotope facilities are now
25 part of the Nuclear Laboratory's Business Unit. Don

1 Taylor, Director of Facility Operations, reports directly
2 to Bill Shorter, General Manager of Overall Site Reactor
3 Operations, who in turn reports to me.

4 With respect to the MDS Nordion Medical
5 Isotope Reactor Project, Ron Cullen, Vice President of
6 Projects, has been appointed the AECL executive
7 responsible for the project. Klaus Wittann reports to Ron
8 Cullen and has been appointed the Project Director to lead
9 the project delivery team.

10 Regarding operational improvements, we have
11 implemented a comprehensive system performance monitoring
12 program and a corrective action program, which we have
13 called IMPACT, and that's an acronym for Improvement
14 Action Program, which is based on similar action programs,
15 corrective action programs that are typically called CAP
16 or Corrective Action Program used within the nuclear
17 utility sector.

18 The implementation that continues the
19 improvement plan has resulted in the successful completion
20 of a significant number of actions, all within the dates
21 committed to the CNSC staff. Following the success of the
22 operation's continuous improvement plan, the project team
23 has implemented a project improvement plan. The purpose
24 of the plan is to improve the areas of human performance,
25 engineering work process, safety analysis and plant

1 configuration control.

2 We have increased quality assurance
3 presence as quality surveillance staff routinely review
4 all work plans in addition to performing surveillance
5 during activities during actual field work. The dedicated
6 isotope facilities continue to introduce and monitor the
7 effectiveness of event free tools commonly used within the
8 nuclear industry and these include tools such as
9 conservative decision making, safe practices and pre-job
10 briefing, among others.

11 Staff are recognizing the clarity and value
12 these tools bring to the workplace and we are seeing
13 evidence of them being adopted across the entire
14 organization as a standard way or habitual way of doing
15 work in the facilities.

16 We have implemented the operational
17 readiness review process, based on industry best practices
18 as a means to ensure the facilities can be declared ready
19 for service and operation at each key milestone.

20 It is worth noting that with these
21 operational improvements in place, the recent maintenance
22 outage in preparation for the 5 megawatt power co-
23 efficient of reactivity test was completed safely and
24 without an event free day reset.

25 As part of the readiness for 5 megawatt

1 testing, we have reconfirmed that all major safety related
2 systems meet safety design requirements. The field work
3 preventive maintenance program completeness and
4 outstanding non-conformances have also been reviewed to
5 ensure operational readiness of the MAPLE One reactor for
6 5 megawatt operation.

7 AECL is confident that following
8 significant investigation by ourselves and independent
9 organizations, we are in a position to solve the positive
10 power co-efficient of reactivity issue. The work
11 performed by these independent organizations supports
12 AECL's hypothesis with regard to the cause of the positive
13 power co-efficient of reactivity, namely target bowing
14 and/or local cool and hot spots. The testing of the MAPLE
15 One Reactor at 5 megawatts will allow AECL to confirm the
16 cause of the PCR and develop engineered solutions to
17 mitigate the issue.

18 With respect to the new processing
19 facility, there is a significant amount of work that needs
20 to be completed in order to ensure the successful
21 commissioning of the facility. Conceptual design changes
22 for calcination and cementation have been finalized and we
23 are proceeding with a detailed design change to meet the
24 active commissioning schedule.

25 The dedicated isotope facilities operation

1 team and the project team are working closely together to
2 ensure that the outstanding work is completed safely and
3 to schedule to allow active commission to commence in
4 October of 2007.

5 The dedicated isotope facility team
6 continues to develop an effective communication channel
7 and relationship with the CNSC staff. We have established
8 good communications with CNSC staff in order to work
9 efficiently with respect to resolving any emerging issues.
10 The communication practices between AECL and the CNSC
11 include regular verbal updates with staff, monthly senior
12 executive meetings, monthly safety and licensing meetings,
13 commissioning and technical meetings, as required,
14 including walk-throughs of key licensing submissions, such
15 as the 5 megawatt licensing case.

16 In summary, at the mid-point of the current
17 licensing term, AECL is making steady progress against all
18 regulatory commitments and requirements. AECL will
19 continue to safely operate the dedicated isotope
20 facilities as a capable, competent organization with
21 sufficient numbers of qualified and CNSC certified staff
22 and programs in place. We will continue to resolve
23 technical issues, complete nuclear commissioning and meet
24 obligations for continued isotope production and supply.
25 We will continue to implement improvement programs that

1 support safe, high quality operation and draw by the
2 lessons learned by others in the industry. We will also
3 continue to meet all regulatory criteria on health,
4 safety, security and the environment as well as Canada's
5 international obligations.

6 In summary, Madam Chair, Members of the
7 Commission, I believe that the operations of the dedicated
8 isotope facility are being appropriately managed and
9 issues are being resolved as they arise with the highest
10 priority being placed on issues related to safety.

11 AECL is committed to the continued safe
12 operation of the dedicated isotope facilities. This ends
13 my presentation and support of the dedicated isotope
14 facilities Mid-Term Report and we would be pleased to
15 answer any questions.

16 **THE CHAIRPERSON:** Thank you, Mr. McGee.

17 And perhaps I'll start with Dr. McDill.

18 **MEMBER MCDILL:** Thank you.

19 Just one question, I think, to AECL. Would
20 you comment, please, on the Continuous Improvement Program
21 and the use of an inappropriate revision of the critical
22 safety document which is referenced in CMD 06-M62?

23 **MR. MCGEE:** Brian McGee for the record.

24 I'll ask Don Taylor to answer the portion
25 of the question related to the use of the document, but

1 before we do, let me just make a couple of comments on the
2 state of the Continuous Improvement Plan.

3 So where we are with the Continuous
4 Improvement Plan right now is -- and this tends to be a
5 pretty typical type of organizational behaviour at this
6 point -- we chose earlier on to put a focus on the
7 people's side of it as a dominant aspect of how we were
8 going to achieve the improvements and I think that's been
9 relatively successful but there also is, of course, a part
10 of it is driven by business processes and methods. What
11 we have succeeded in achieving is the implementation of
12 those business processes and methods.

13 The people part of it -- the people process
14 part of it takes a lot longer to achieve and it never
15 stops, frankly, like that will be something that we'll
16 continue with, ongoing. And so CNSC staff's comments, I
17 think, reflect that we still have a significant ways to go
18 on the journey to achieve operational excellence in a high
19 performance culture in all areas and that's something that
20 will be part of the effectiveness of the program and the
21 plan that will be ongoing for us indefinitely.

22 And at that point, I'll turn it over to Don
23 to answer the specific item identified.

24 **MR. TAYLOR:** For the record, Don Taylor,
25 Director of DIF Operations.

1 So I believe the question referenced the
2 inappropriate revision number of a Criticality Safety
3 Document. We have in our operating limits and conditions
4 referenced two documents that are key documents, and this
5 is one of them.

6 Unfortunately, the reference that we had in
7 the operating limits and conditions documents was to a
8 wrong revision number of the Criticality Safety Document
9 and, in fact, a later revision had been published.

10 So to correct that, we have issued the
11 correct version -- the later version of the Criticality
12 Safety Document to CNSC staff and we have put in a process
13 in our document controls to prevent this kind of instance
14 from happening again.

15 **MEMBER McDILL:** Thank you.

16 And what is that process that you put in
17 place so that incorrect documents won't be used? Are you
18 stripping all documents?

19 **MR. MCGEE:** Brian McGee for the record.

20 I'll ask Don Taylor to answer that
21 question.

22 **MR. TAYLOR:** Don Taylor for the record.

23 So the process is effectively for any of
24 the listed documents. In the OLCs a flag would go up when
25 the document is approved and it would be flagged to our

1 safety and licensing people for issue to CNSC staff at the
2 appropriate time.

3 **MEMBER McDILL:** Does staff have any
4 comments?

5 **MR. PEARSON:** Bruce Pearson, Project
6 Officer, for the record.

7 Yes, I think that this was an issue that we
8 also had discovered during our recent or our 2005 DIF
9 Quality Assurance Program Audit. One of the problems is
10 documents are issued for release within AECL but they need
11 approval from CNSC and it can cause some problems within
12 AECL.

13 And as Mr. Taylor had indicated, they do
14 have measures in place now to ensure that a document
15 that's issued within AECL for use, it's issued for use for
16 submission to the CNSC and it can't be used within AECL
17 until it's approved by the CNSC.

18 So my understanding from the process is
19 that only a very select number of people know that the
20 later version of the document exists and it only exists
21 for submission to the CNSC so they're not able to use it
22 within AECL until it's formally approved by the CNSC. And
23 I think their document control system would also have a
24 reference to the correspondence from the CNSC approving
25 the use of the document.

1 **MEMBER McDILL:** Thank you.

2 **THE CHAIRPERSON:** Dr. Barnes.

3 **MEMBER BARNES:** To AECL, I assume in the
4 documents, but I'd like to ask you the question: Do you
5 envisage successful completion of the MAPLE Reactor
6 Project and if so, when?

7 **MR. MCGEE:** Brian McGee for the record.

8 I'll ask Klaus Wittann, the Project
9 Director, to answer the schedule-related question in terms
10 of dates, but let me say that, yes, we're confident that
11 we're on a path of success and so that's -- you know, we
12 believe that we have a success path.

13 So I'll turn it over to Klaus.

14 **MR. WITTANN:** It's Klaus Wittann for the
15 record, Project Director.

16 We have an agreed-upon milestone schedule
17 with our client MDS Nordion. We have all the confidence
18 that we will achieve it. We have assigned additional
19 resources to this project, experienced resources from
20 overseas. Our completion dates are for MAPLE 1 June '08.
21 MAPLE 2 will follow one year later and for the NPF the act
22 of commissioning -- the finishing target date is June '08.

23 **MEMBER BARNES:** And on Slide 6 on page 3,
24 the last two bullets are that PCR issue is poised for
25 resolution following significant work and testing of the

1 MAPLE Reactor at five megawatts will allow AECL to confirm
2 the cause of the PCR.

3 At what point do you think that those two
4 will be resolved?

5 **MR. MCGEE:** Brian McGee for the record.

6 I'll ask Ken Hedges to answer the question.

7 **MR. HEDGES:** For the record, Ken Hedges,
8 Vice-President, AECL.

9 Just so we've got a little context, the
10 power co-efficient was initially to be negative .1 milli-k
11 per megawatt. We measured it at between .2 and .3. We
12 have submitted a safety case using a bounding value of .4
13 milli-k per megawatt and showing it is safe to move ahead
14 with the test.

15 As Mr. McGee said, we believe that target
16 bowing and flow distribution within the reactor are the
17 key issues. We have had three international organizations
18 independently review our calculations, do independent
19 calculations and they all fully support the Test Program.
20 We are hoping to start very soon the Test Program and it
21 would be finished by the middle of 2007.

22 **MEMBER BARNES:** So the middle of 2007
23 you're likely to be here telling us that you have solved
24 the PCR problem?

25 **MR. MCGEE:** Brian McGee for the record.

1 That's correct.

2 **MEMBER BARNES:** Does staff -- just getting
3 these dates right, staff, you indicated in your
4 presentation that medical isotope work could not start
5 until November '07 and this would therefore be covered in
6 the next licensing, but from the dates that we have just
7 heard, which are June '08 MAPLE 1, June '09 MAPLE 2, and
8 the Processing Facility June '08, it really isn't well
9 until '08, not November '07. Is that correct, the medical
10 isotope work could start?

11 **MR. LANGLOIS:** Etienne Langlois for the
12 record.

13 The date that's given in the CMD for the
14 NPF is for the start of the active commissioning; that is,
15 verification of the operation of the facility using
16 radioactive material. Once that is completed there is
17 still some additional testing that AECL needs to be done
18 for the acceptance tests for the clients and only after
19 that is the facility to be declared in service.

20 **MEMBER BARNES:** A question to staff. You
21 address primarily three safety areas that were "below
22 requirements" or received the "C" grade. Could I just --
23 before going on to AECL, could I just get assurance that
24 the other areas are still at a "B" level, sort of meeting
25 requirements? None of the others have slipped down into

1 "C"; is that correct?

2 **MR. PEARSON:** Bruce Pearson, for the
3 record.

4 We don't have any evidence from our site
5 visits or any of the reports being provided to us that
6 there's any degradation from the "B" level given in the
7 licence renewal.

8 **MEMBER BARNES:** And to AECL, given that
9 we're at the midpoint of sort of a two-year licence
10 starting November '05, so we're now in December '06, was
11 it your impression when you got this licence in November
12 '05 that one year or 13 months hence, two of these areas
13 that were below requirements would still be below
14 requirements in your concept of continuous improvement
15 plan?

16 **MR. MCGEE:** Brian McGee, for the record.

17 I wasn't involved at that time. So I can't
18 say what was in our minds at the time. What I can say to
19 you is this is about the progress that I would expect,
20 that the facility is moving forward. An improvement cycle
21 like this, you know, I would describe it in other
22 situations in front of the Commission as a journey. It
23 really is a journey to a large extent.

24 At the same time that we're moving forward
25 and addressing the issues that were identified in November

1 2005, frankly we're raising the bar continuously. And so,
2 you know, that is an ongoing process and it's one in --
3 you know, I'm not surprised that there is still work to do
4 to improve the effectiveness of these things that we have
5 changed.

6 So observation and coaching for an example,
7 we've put a program like that in place. You train people;
8 you train supervisors. You make staff aware that there is
9 going to be this observation and coaching process and you
10 get people out in the field, managers in particular out in
11 the field doing it, and there's some follow up that has to
12 be done to help them become more and more effective with
13 it, help them see things that they wouldn't otherwise see.

14 So it really is a people process thing. So
15 as sort of as coming in now, I would say, yes, this is
16 about where we should be. The progress is reasonably good
17 at this point.

18 **MEMBER BARNES:** And I do appreciate the
19 efforts you made in improving project management, but
20 still a year hence out of November '05 we're still seeing
21 only one of the three elevated to "B" and the document
22 from staff had quite a series of examples why AECL would
23 still be ranked "C" in operating performance and
24 performance insuring, especially in the QA area.

25 So a question that, I think, comes out of

1 that impact program in terms of identifying good
2 corrective actions; ensuring that when we do the
3 corrective actions, that we did what we said we were going
4 to do, and then making sure that what we said we were
5 going to do was in fact effective in correcting the
6 problems.

7 So it really is a continuous improvement
8 cycle and that will go on indefinitely. If it doesn't go
9 on indefinitely, then that would of concern to me.

10 **MEMBER BARNES:** But there is -- I'm just
11 trying to -- censuring the words and the substance here,
12 which I think is we're having a midterm review primarily
13 because AECL was failing in some very key areas, and also
14 over a period of time not able to achieve what you wanted,
15 which was the completion of the MAPLE reactors.

16 So we've seen AECL respond in a variety of
17 ways but still, under the licence agreements, with an aim
18 of achieving, of meeting the requirements set under the
19 licence. And so we were here to address particularly your
20 efforts to address those three areas.

21 How you go about them is the way that
22 you've explained, but I think obviously your aspiration
23 and project management is not that this can be answered
24 just by an ongoing lifetime activity. It has to be
25 sufficiently successful, I would think, by this time next

1 year to come and meet all those requirements.

2 Would you agree with that?

3 **MR. MCGEE:** Brian McGee.

4 I do agree with that.

5 **MEMBER BARNES:** Thank you.

6 **THE CHAIRPERSON:** Mr. Graham?

7 **MEMBER GRAHAM:** Thank you.

8 Just to follow up on this midterm review,
9 AECL has been here many times, maybe not always the same
10 faces, but have been here many times. And as Dr. Barnes
11 has said, you're always talking about continuous
12 improvement, but there are milestones that have to be met
13 and you've given us some dates today of MAPLE 1, June '08,
14 MAPLE 2, June '09, and the processing of June '08.

15 My question I guess first is to CNSC staff.
16 Are these realistic -- now realistic dates that you can
17 take to the -- not take to the bank but give this
18 Commission assurance that those will be the dates?
19 Because we've heard dates before and they have never
20 really become a reality.

21 **MR. HOWDEN:** Barclay Howden speaking.

22 I'm not sure how much we can comment on the
23 realistic dates. Certainly, what we've seen with AECL is
24 they have stretched out things much more than in the past,
25 because sometimes you have to go slow to go fast, you

1 know, to get things resolved early before you can move
2 forward.

3 From our perspective, to the extent
4 possible, we try to respect AECL's schedule. However, we
5 make our decisions based on risk and, I think as
6 demonstrated, we exercise a lot of due diligence.

7 I can say with regards to the five-megawatt
8 safety case for re-measuring the PCR and starting to try
9 to validate what AECL thinks of the causes of it, that is
10 close from our perspective. It's not yet approved but it
11 is close and if it is approved, we will be building in
12 hold points as they go along, and they also have to
13 present a further safety case for further tests because
14 part of it is you learn stuff and then they feed into the
15 system and look at the safety case.

16 If they're successful with the tests, then
17 the next major step is to come back with the fixes for the
18 PCR. So in terms of timing, if everything goes to Hoyle,
19 yes, it's a very reasonable timeline because they really
20 have stretched it out and given themselves lots of time,
21 knowing that it's iterative process.

22 But I'm not in a position to predict
23 success for them. I can only assure you from the
24 regulatory standpoint that we are exercising due
25 diligence.

1 **MEMBER GRAHAM:** And I realize that and I
2 didn't mean to put it that way.

3 AECL.

4 **MR. MCGEE:** Brian McGee, for the record.

5 We're confident in the schedule, and I'll
6 ask Ron Cullen to comment as the project executive on this
7 facility. We're confident in the schedule but I will
8 reinforce that as we progress through each of these steps,
9 you know, as a licence holder and as the operating
10 authority, I need to be satisfied that it's safe to
11 proceed.

12 So before we proceed, I won't be driven by
13 schedule alone. I need to be driven and make sure that as
14 we progress through each of these major steps that the
15 operation of the facility is safe and appropriate. And so
16 that will be my overriding concern.

17 I'll let Ron talk to the schedule aspects.

18 **MR. CULLEN:** Ron Cullen, Vice-President,
19 Projects.

20 One of the aspects that we did in AECL and
21 one of the appointments that was given to me was to take
22 on all of the projects and bring the lessons learned from
23 our overseas successes and bring them back into our
24 programs here.

25 And this is one of the big appointments for

1 me was to take on the DIF and the MMIR and to bring to it
2 the experienced staff that we had coming off overseas
3 projects.

4 And looking at the schedule that has been
5 presented, I believe that with this staff, these
6 milestones that have been set can be achieved.

7 **MEMBER GRAHAM:** With regard to safety and
8 as a layperson, I would like to have explained to me just
9 a little bit with regard to the two reactors and
10 containment, you're going to go forward with the PCR.
11 You've had outside consultants that have given you
12 assurances to take it up to different stages and so on,
13 take the reactors up to different stages.

14 Containment, is that a major concern? Put
15 it this way; are there any other reactors anywhere in the
16 industrialized world that do have -- that do not have
17 containment?

18 **MR. MCGEE:** Brian McGee for the record.
19 I'll ask Victor Snell to answer that
20 question.

21 **DR. SNELL:** Victor Snell for the record,
22 Licensing Director.

23 It's a complex answer. I'll try and give
24 you a highlight. Among research reactors, some have
25 containment, some do not. It depends a lot on the age of

1 the reactor, the reactor characteristics, the location.

2 The licensing basis for MAPLE was to have a
3 confinement which is an envelope around the reactor which
4 will retain radioactive products but not withstand high
5 pressures.

6 The safety case for the test, which I think
7 underlies your question, has been very thoroughly vetted
8 within AECL given the current MAPLE characteristics and,
9 in fact, we've made design changes to the MAPLE control
10 system to slow the reactor down to the point where we
11 believe the tests are safe to perform in the current
12 configuration.

13 **MEMBER GRAHAM:** So in your start-up phases,
14 and again as a layperson, to understand this in my own
15 mind, when you're starting up and taking it to various --
16 taking a reactor to various levels -- and I guess maybe to
17 CNSC staff first -- when you're taking it to various
18 levels and with the fact that containment is very limited,
19 I believe, in these reactors, if at all, what extra
20 assurances of safety is in place with regard to the PCR of
21 the changes between negative and positive and so on? Is
22 everything in place that you can stop and that containment
23 can be maintained? And I'm not sure that's the right
24 wording, but that's just the way I see it.

25 **MR. HOWDEN:** Barclay Howden speaking.

1 AECL has presented a safety case, and I'm
2 going to ask Mr. Pearson to describe sort of the criteria
3 we looked at in reviewing it. I would like to re-
4 emphasize that this is -- the reactor has a confinement
5 system which, as Dr. Snell said, is to retain
6 radionuclides but not to contain pressure. I just want to
7 make it clear that it's a confinement system, not a
8 containment system.

9 So I'm just going to ask Mr. Pearson to
10 briefly tell you what our criteria and -- our concerns
11 have been in reviewing of the safety case that's come
12 before us. As yet, we have not accepted it, but we're
13 very close because we're working through the details with
14 AECL.

15 **MR. PEARSON:** Bruce Pearson for the record.

16 The original licensing basis for the MAPLE
17 reactors relied on the effectiveness of the shutdown
18 systems to terminate initiating events like loss of
19 regulation events, among other events, but loss of
20 regulation events in particular for this case.

21 What has happened now is with the discovery
22 of a positive power coefficient, it puts greater stress on
23 the shutdown systems. And to compensate for the negative
24 impact of the positive PCR, AECL has proposed a number of
25 design changes, design changes like limiting the speed of

1 the control absorber rods, limiting the height of the
2 control absorber rods. They have some new trip set points
3 -- or sorry, new trips installed. They have lower trip
4 set points to run the tests.

5 What they're doing is presenting a safety
6 analysis to show that the design with these changes and
7 with a confinement concept is robust enough to handle any
8 of the initiating events that might arise.

9 **MEMBER GRAHAM:** My question then to
10 someone, and probably to AECL, are you confident that the
11 design changes have been tested and proven in other areas
12 and other reactors around the world that you know that
13 they're going to work here in these two reactors which are
14 running quite far behind schedule, as far as coming into
15 production? Can you give us ultimate guarantees that
16 these design changes had been tested somewhere else?

17 **MR. MCGEE:** Brian McGee for the record.

18 I'll turn the question to Victor Snell and
19 ask him to answer.

20 **DR. SNELL:** Victor Snell for the record.

21 First, I wish to agree with what Mr.
22 Pearson has said. That's an accurate description of our
23 safety case.

24 In terms of the design changes, basically,
25 without getting into too much technical detail, we're

1 slowing the reactor down in terms of the speed of the
2 control system. So there are changes to the speed at
3 which the control rods move. And we're doing that to
4 compensate the effect of the positive PCR. So it's not a
5 fundamental change to the reactor design. It's a change
6 to the speed at which the rods operate.

7 The other criteria that we've used in our
8 accident analysis is to limit the power in an accident,
9 even with a positive PCR, to the levels at which MAPLE had
10 operated before the PCR was actually discovered, so that
11 the peak power in an accident, in almost all cases, is
12 below the level at which MAPLE has operated in the past.

13 So we're taking fairly conservative
14 assumptions in the safety analysis. For example, we're
15 testing at 5 megawatts. The reactor is originally
16 designed to operate at 10. So we're running at half the
17 power that MAPLE was designed for as one of the ways of
18 compensating the effect of a positive PCR.

19 The changes really are in the control
20 system and in trip systems rather than fundamental
21 characteristics of MAPLE.

22 Sorry, to answer your direct question, the
23 fact that the control rods work more slowly has been
24 tested, of course. That's been part of the commissioning
25 tests and non-active commissioning.

1 **MEMBER GRAHAM:** It has been tested at low
2 power and by slowing the reactor at lower power? That has
3 been tested in that way?

4 **MR. MCGEE:** Brian McGee for the record.
5 I'll ask Victor Snell to answer.

6 **MR. HEDGES:** Ken Hedges for the record.
7 The behaviour of the reactor has been
8 simulated in a full simulator and shown that the changes
9 in trip set point are adequate to keep us within the
10 relatively conservative power level of 8 megawatts that
11 Victor mentioned.

12 We also will be doing a low-power test,
13 once we get approval, to make sure that all the trip set
14 points and all of the new trips are effective before we
15 move to higher power.

16 **THE CHAIRPERSON:** We're going to just take
17 a 10-minute break. I think we've got a lot more
18 questions. We might as well take a break first.

19 --- Upon recessing at 4:33 p.m.

20 --- Upon resuming at 4:42 p.m.

21 **THE CHAIRPERSON:** We will continue with Mr.
22 Graham.

23 **MEMBER GRAHAM:** Thank you, Madam Chair.

24 I only had a couple of questions, but I
25 would like to have an answer to my last question, before

1 we go any further, with where this has been tested and how
2 it's been tested and so on with the two components.

3 **MR. MCGEE:** Brian McGee for the record.

4 I'll ask Ken Hedges to answer.

5 **MR. HEDGES:** For the record, Ken Hedges.

6 The reactor control system which controls
7 the speed at which these reactivity devices move has been
8 tested in a full-scale simulator. The simulator has been
9 validated and verified, and that was the basis for the
10 design changes.

11 The design changes are tested in the
12 reactor at low power when we move into the so-called
13 operate mode where we can actually move the reactivity
14 devices, and they're all tested before we're going into
15 these tests that we have proposed for the PCR.

16 I think that answers it.

17 **MEMBER GRAHAM:** Where was the full scale
18 simulator and so on, used?

19 **MR. HEDGES:** The full scale simulator was
20 built at Chalk River and it's in Building 600 at Chalk
21 River and this is how we designed and how we verified our
22 reactor control system.

23 **MEMBER GRAHAM:** So, the advice from the
24 three independents that you've got, has been fed into --
25 you're doing this in Chalk River or the three independents

1 that you talked about, have they -- are they backing this
2 concept? Are they backing this with the full knowledge of
3 how it's been used in other places?

4 **MR. MCGEE:** Brian McGee for the record.

5 I'll ask Ken Hedges to answer.

6 **MR. HEDGES:** Ken Hedges for the record.

7 The issue around PCR is that the calculated
8 values, using the computer codes and modelling the
9 phenomena, are not adequately predicting the measurements
10 in the field. And so, we asked the Idaho National Lab in
11 the United States to completely remodel and re-simulate
12 the reactor from scratch, which they did and they
13 predicted the same PCR value that our computer codes and
14 models did.

15 So, it appears that there is an unmodeled
16 phenomenon and we asked the Brookhaven National Laboratory
17 in the United States to go through every single
18 calculation that AECL had done and produced a report that
19 said they were either good or there were errors in them,
20 and they came back and they confirmed that they could find
21 no faults in the analysis that AECL had done.

22 The other company we went to is INVAP,
23 which is an Argentinian company that's built research
24 reactors in many countries, including Australia, Egypt,
25 and I think they've built a total of something like eight

1 research reactors. And they were asked to look at what
2 they believe was the cause of this discrepancy. We also
3 got recommendations from Brookhaven on the reasons for the
4 discrepancy in from Idaho and they are all supporting the
5 proposal to do these tests that we have submitted to the
6 CNSC. They believe that the unmodeled phenomena are
7 related to the flow pattern, which was described by Mr.
8 McGee, and to the bowing of the highly enriched targets,
9 which was also mentioned earlier. They believe these are
10 the two primary causes and they support the test program
11 that we have put before the CNSC.

12 They did not go in and look at the control
13 systems in the reactor. They were looking at the PCR test
14 program and judging whether in fact that was appropriate.

15 **THE CHAIRPERSON:** Doctor Dosman?

16 **MEMBER DOSMAN:** Thank you, Madam Chair.

17 There's been quite a lot of discussion and
18 I'm trying to get to the bottom line. And I'm asking
19 AECL, the following question. Have you decided that this
20 reactor, which was designed to have a negative coefficient
21 has now got a positive coefficient and you don't
22 understand it and you've consulted the international
23 experts, and so now, you're focussing on safe ways to run
24 a reactor that is going to have a positive coefficient and
25 you can't change it. Is that the bottom line?

1 **MR. MCGEE:** Brian McGee for the record.

2 That's not the bottom line. We're focussed
3 right now on two possible causes, based on supporting
4 analysis from three independent parties. We're focussing
5 on doing very limited 5 megawatt testing and a series of
6 tests up to 5 megawatts, to validate that information.
7 Our current plans are just to do that 5 megawatt testing
8 and we're quite confident, based on everything we've
9 analysed and the analysis and the support that we've had
10 from third parties, we're quite confident that these are
11 the causes and so we'll do that testing, shut back down
12 and then we'll go and do the analysis, and so on, and do
13 remediation work. We believe that, in both these cases,
14 there are things that we can do to reduce or eliminate the
15 positive coefficient of reactivity.

16 **MEMBER DOSMAN:** So, I take it that AECL
17 still believes that it can make this reactor into a
18 machine that will have a negative coefficient of
19 reactivity and that is your focus?

20 **MR. MCGEE:** Brian McGee for the record.

21 Our focus right now is to eliminate the
22 positive coefficient of reactivity, as part of our testing
23 program. That's the purpose of programs, is to
24 understand, to validate what we believe is an analytical
25 understanding of the situation to do the testing to

1 confirm that, and then shut back down and undertake the
2 necessary design changes to eliminate the coefficient of
3 reactivity.

4 **MEMBER DOSMAN:** But it sounds as though you
5 are also, at the same time, trying to do what you can to
6 create control mechanisms, and so on, to enhance your
7 control mechanisms?

8 **MR. MCGEE:** Brian McGee for the record.

9 The changes that you heard described to the
10 control mechanisms were part of the design changes to the
11 reactor regulating system that we undertook to satisfy
12 ourselves that the 5 megawatt testing could proceed. So
13 those changes were done in order to support our safety
14 case for 5 megawatt testing; support safety case and
15 operations for 5 megawatt testing.

16 **MEMBER DOSMAN:** Of course, the ultimate
17 purpose of all of this from a person like myself,
18 representing the public, is that AECL has a reactor that
19 can be managed safely. And it strikes me that AECL still
20 has a very large number of unresolved issues here and I
21 guess I'm asking you, quite specifically, does AECL intend
22 to try to run this reactor with a positive PCR, with
23 enhanced safety procedures. I guess that's my question.

24 **MR. MCGEE:** Brian McGee for the record.

25 I understand the specifics of your

1 question. I'm not sure I can give you an answer that's
2 going to satisfy you quite that specifically. Our
3 singular focus right now, is a safety case associated with
4 5 megawatt testing. We're not in a position -- I'm not in
5 a position to preempt the outcome of that. We're quite
6 confident in what we're doing. We're quite confident in
7 what we believe is going to be outcome of this testing.
8 And so, our focus right now as an organization is, on
9 executing that testing safely and eliminating the PCR.

10 **MEMBER DOSMAN:** So, may I ask you this
11 question. Is AECL fully confident that you can operate
12 this reactor, 5 megawatt for testing in a safe manner?

13 **MR. MCGEE:** Brian McGee for the record.
14 As a site licence holder, I satisfied
15 myself in a number of ways that the 5 megawatt test
16 program is safe and appropriate. And so, that's the
17 primary hurdle that I need to be satisfied of and I've
18 done that in a number of ways. One is based on my
19 operating experience, while I'm not an analyst, I do
20 understand the basis of safety cases and so I've reviewed
21 the case on two different occasions, personally. I've
22 looked at the correspondence associated with that, that
23 supports the safety case and clarifies different points in
24 a safety case.

25 On top of that, I am familiar with the

1 people involved, I've discussed the safety case with the
2 key people involved, the more senior people involved, I'm
3 aware of their credentials and their capabilities. So,
4 I've satisfied myself at that level, as well as the
5 oversight that they executed of other staff in the
6 development of the safety case. I've made myself aware of
7 the supporting independent parties that were involved in
8 validating where we were with it and the final side. So
9 that's more or less on the project and the design analysis
10 side.

11 On the operation side, I have satisfied
12 myself, went through the review of the Operational
13 Readiness Report, the Operations Facility Authority, the
14 Director of Reactor Operations for the DIF, will finalize
15 operational readiness declaration before we operate, and
16 on several occasions, including as late as last Friday, I
17 probed into the specifics of some of the conclusions that
18 we're drawing about our operational readiness. On each of
19 those occasions, I've received what I view as satisfactory
20 answers to that, to support the fact that I believe that
21 we're, from an oversight point of view, that we're ready
22 to operate this reactor safely to 5 megawatts for test
23 purposes.

24 **MEMBER DOSMAN:** I'm sorry. I wonder if I
25 might ask CNSC staff; if CNSC staff has the required

1 information to be able to confidently assess the safety of
2 this reactor operating at the stated level?

3 **MR. HOWDEN:** Barclay Howden speaking.

4 I'd like to answer your question in two
5 parts, Dr. Dosman. First, on the whole issue with testing
6 the PCR and I'd also like to comment on the longer term or
7 longer term view of this reactor.

8 With regards to the proposed tests that are
9 in front of us today, basically we've received the safety
10 case and it has been described. It's a case that has
11 bounding assumptions and a lot of technical detail that's
12 been looked at by our reactor physics group and our
13 reactor thermalhydraulics group.

14 But basically, as far as we know, there's a
15 positive PCR in this reactor. So because of that, they've
16 proposed some of these design changes which are things
17 like slowing things down. They've also proposed
18 additional measures, like the additional trips. But also
19 one of the key things is that the testing would be done
20 for extremely limited period of time. We're talking hours
21 and days, not months. Maybe the tests take place over a
22 period of time, but the actual operation would be for a
23 very short period of time.

24 In terms of some of the measures they've
25 proposed, you know, in terms of slowing things down

1 they've done some of the testing processes and we have
2 witnessed some of the testing, you know. So if they're
3 going to slow the control absorbers down, we can actually
4 see that they can slow them down.

5 As well, we've looked at what I'd call
6 their process to assure that changes are implemented
7 correctly because this is a concern given the past QA
8 problems with that.

9 So ultimately, when it comes down to what I
10 would call the approval process, which we've been going
11 through for several months and haven't got there yet; is
12 we use all this information including the bounding
13 assumptions and then we will make a judgement call. Staff
14 will make a judgement call using many specialists, their
15 expertise, who have themselves personal expertise, but
16 also we have gone out. We've consulted statisticians.
17 We've consulted other people who have certain expertise to
18 get some third party feedback on areas where either we
19 didn't have the expertise ourselves or wanted another
20 person to look at it. So we've gone through that process.

21 But ultimately then, the specialists who
22 are working on it need to sign it off, then their
23 directors have to sign it off and then ultimately it comes
24 to Mr. Santini and ultimately to me to sign off. Those
25 signoffs haven't been done yet.

1 So I would say, although our confidence has
2 grown, because clearly we're very close -- we're at the
3 point where we're discussing back and forth, details to
4 make sure we understand, you know, what does this mean,
5 what is the confidence level, what are the uncertainties?
6 And that's why we've brought in statisticians and looked
7 at this sort of thing.

8 So we're getting close. Ultimately, when
9 the collective "we" comes to a conclusion, if we think the
10 tests can go forward, I will sign it with confidence that
11 the reactor can be operated safely within the constraints
12 that have been put there. And we will keep you informed
13 of how that goes.

14 So in terms of, if the collective team has
15 a consensus, we will go forward and I will sign it with
16 confidence.

17 Long term, which I think was one of the
18 other questions you were getting at, was the original
19 safety case proposed a negative PCR. We accepted that
20 safety case. We didn't prescribe that you have to have a
21 negative PCR, but it was in the safety case and the
22 expectation, general expectation is that you have a
23 negative PCR in these reactors.

24 So in the case of a positive PCR, what
25 we've been looking at is we would make decisions based on

1 risk. And in our view, a positive PCR would be very
2 difficult to accept because it has a negative impact on
3 safety. That doesn't preclude a decision based on risk,
4 but at this moment in time, we would find a positive PCR
5 very difficult to accept and someone would have to do a
6 lot of work to convince us of that and we're certainly not
7 convinced of that at the moment.

8 **MEMBER DOSMAN:** Thank you very much.

9 **THE CHAIRPERSON:** Mr. Harvey.

10 **MEMBER HARVEY:** Merci, Madame la Présidente.

11 I have two questions which are linked
12 together. Both have to do with the wording of CNSC staff
13 in their status report.

14 With regard to environmental protection in
15 page 7, the fourth paragraph:

16 "The environmental protection safety
17 area for the MAPLE reactor should be
18 rated "B" for the program and upgraded
19 to "B" for the implementation."

20 We could think that the situation has
21 improved but right after you say:

22 "However, the program implementation
23 should be formally inspected to
24 confirm this."

25 So do we have presently a "B" not

1 confirmed?

2 And should the February inspection not
3 confirm this, what would be the rating?

4 **MR. HOWDEN:** Barclay Howden speaking.

5 I'm going to ask Gerald Crawford, our
6 Environmental Protection Specialist. to provide our
7 response to this on how we've looked at it within the
8 context of the site. But clearly, although we've given it
9 a "B" rating, if we were to find something that wasn't
10 there, we would have to reassess this.

11 I'll ask him to speak to it because he
12 can give you more context.

13 **MR. CRAWFORD:** For the record, Gerald
14 Crawford, Environmental Specialist.

15 The original rating of "B" for program and
16 "C" for implementation was based on the previous site
17 rating for the site as a whole.

18 If you -- you won't recall, but your
19 colleagues may recall that in the site licence submission
20 for the site as a whole in June this year, we rated the
21 Environmental Program for the site as a "B" for the
22 program and a "C" with an improving trend for
23 implementation. That was based on -- in 2005, we did an
24 inspection of NRU in some detail in their environmental
25 program. That was mid-2005. November, 2005 we did an

1 inspection of the site program. And specifically, we
2 looked at a number of areas. We didn't include MAPLE, but
3 we did look again at NRU, waste management areas, some of
4 the project areas were also covered and the waste
5 treatment centre.

6 From that we raised a number of actions and
7 there are a number of action items that were given to
8 Chalk River to implement. They've all been successfully
9 completed in the intervening period. So they have a
10 record of demonstrating that they have a good program and
11 the implementation is improving onsite.

12 Based on that, we felt that it would be
13 fair to give the DIF project a "B" primarily because we'd
14 inspected their documentation and it followed the site
15 program and it was all in place. You're quite right that
16 we haven't been and physically inspected the program and
17 we intend to do that in the coming year.

18 To answer your question, if we find that
19 there are elements of the program that are not being
20 implemented satisfactorily, then we'll use the normal
21 enforcement action of issuing action items or directives
22 or orders, depending on what we find.

23 Obviously, if we found something that
24 required an order, then you would know about it as the
25 Commission.

1 **MEMBER HARVEY:** I understand very well what
2 you say. Like I said, my problem was with the wording,
3 saying that this is a "B" and however, we have to do that.

4 I have the same problem in the conclusion
5 in page 13. In the last paragraph, when you say that:

6 "The risk which continued operation of
7 the MAPLE Reactor poses to the health
8 and safety of persons, to the
9 environment, to the maintenance of
10 national security and to international
11 obligations that Canada has agreed to
12 should not be unreasonable for the
13 remainder of the current licence
14 period."

15 But I don't see anywhere in the Appendix it
16 should not be. It's do not and do not. And then here you
17 come with should not. So you are not -- you are uncertain
18 that they -- so that's the kind of wording that bothers
19 me.

20 **MR. HOWDEN:** Barclay Howden speaking.

21 This is to show that there is no guarantees
22 and I think, actually, in a previous hearing Mr. Graham
23 asked me why we had put the word "likely" in, and the
24 reason we had done that was even though we have a high
25 level of confidence, we have put in a little bit of

1 caveats because risk is risk and there was no guarantee.

2 Every day we have to be in a position to
3 ask ourselves two questions: Is the licensee qualified
4 and is the licensee putting in measures? And it's a long
5 thing that gives us assurance that unreasonable risk is
6 not being presented.

7 We have to be able to answer those
8 questions positively each time because if that's not the
9 case we are in a serious position where we'd have to take
10 immediate enforcement actions. What we normally do with
11 that, as you have seen with others, is we issue orders to
12 basically be very prescriptive on what is required to
13 protect it.

14 But, yes, that is a -- it's a bit of a
15 caveat to show that we can't guarantee it but we have a
16 high level of confidence and maybe "should not" doesn't
17 communicate that to you, but the intention that we are
18 trying to say is that today the risks being posed are
19 reasonable.

20 **MEMBER HARVEY:** I was reading that like the
21 public would.

22 Thank you.

23 **MR. HOWDEN:** Barclay Howden speaking.

24 Yes, I understand that. In the past we
25 have been criticized for being categorically too strong

1 just by using the word "will" and so we went back and
2 revisited that particular thing because it was very
3 strong. So we're trying to find a happy medium to show
4 that there is a level of confidence.

5 However, there are no guarantees and that's
6 the reason why the licensee has programs and we have
7 compliance oversight.

8 But your point is well taken, Mr. Harvey.
9 Thank you.

10 **THE CHAIRPERSON:** Well, Mr. McGee, you
11 commented that you were new and you couldn't speak to a
12 lot of the issues. Well, the Commission has been here a
13 long time on this particular project. In fact, except
14 for, I think, Dr. Snell, I think that most of the faces on
15 this project are new, but I have very clear memories of
16 this because this was put on my doorstep the minute I
17 walked in six years ago and there was root cause not only
18 inside AECL but within CNSC as to how we got where we
19 were, which was not a pretty picture. And it's when
20 projects are in force for a long time, you know, there
21 gets to be a lot of issues at play.

22 And I think one of the things that struck
23 me was Dr. Barnes' comments about, you know, how do we
24 know that everything else is keeping going. You know, we
25 talk about these three areas.

1 So I think that the word that strikes me,
2 which is not very much of a chemist's word to say,
3 probably not what an engineer would say either, but
4 holistic is what basically concerns me, is I think we've
5 got -- and probably Dr. Snell can correct this or whatever
6 -- as my memory strikes, this was 1992 that we first began
7 to talk about this and then by year 2000 we had
8 rejuvenated it, et cetera.

9 So I think one of the real legitimate
10 concerns that I hear coming through from the Commission is
11 a very long gestation period which is not a situation for
12 us that's economic or whatever for us. Really, an issue
13 is how do we make sure that no balls are dropped in going
14 forward on this operational readiness issue which is those
15 specific areas that have been pinpointed by the staff and
16 you have responded to, and then the PCR work which we have
17 heard about is going forward really and the first in kind
18 type of scenario and we are hearing a lot about "first in
19 kind" right now. So the Commission is very aware of this
20 too. In non-reactor settings we are talking about this.

21 I would like to say that the advice to get
22 international experience came from Dr. Barnes. That's
23 where it came from and that shouldn't be coming from a
24 regulator, you know.

25 So I guess I think that what we're looking

1 Commission Members is a great deal of discomfort about are
2 we going to see you back in not a year, literally, the
3 fall. It's October that you're supposed to be making some
4 progress on some things and we don't see the kind of
5 movement here that gives us any sense that this is
6 happening fast enough. Again, it's your economic issues.
7 It's not ours, but fast enough that we feel from our
8 experience in looking at gestation periods of projects
9 that they keep together holistically and keep that, you
10 know, that safety envelope and safety approach. I think
11 that's -- if I can say it, that's what the Commission is
12 worried about. We're not used to seeing projects take 12
13 years to go and we're having turnover of staff and
14 everything and knowledge management is a huge problem in
15 terms of looking at why did we do this and why did we go
16 there. You're facing it; we're facing it. We are all
17 having problems getting staff to do the work that we need
18 to do.

19 So I think if I can say anything, I think
20 that's my sum up where we are and what -- we have spent a
21 lot of time on this, but I just really don't feel that the
22 Commission has a clear idea of where we will be in October
23 -- well, September, you know, and what will be the
24 progress and how will we have some sort of assurances from
25 both the licensee and from staff that this is being

1 treated sort of holistically, not looking at quality
2 assurance over here or something else over here and this
3 over here.

4 This is a mid-term report. It's not meant
5 to necessarily do that. I appreciate that, but I think
6 that's the -- what I am hearing around the room is a
7 significant degree of angst about that. I don't know if
8 you want to comment on that, but that's my sense. And
9 maybe where you think that what we'll see in September so
10 that our hopes aren't built up, that we are going to get
11 something and not get what we need to see in the long run.

12 **MR. MCGEE:** Brian McGee for the record.

13 Thank you. Thank you, Madam Chair.

14 On previous occasions I just -- really, not
15 to comment so much but to support a great deal of what
16 you're saying -- on previous occasions I have talked about
17 my commitment to operational excellence.

18 So let me reinforce one thing that I have
19 said in past appearances and that, you know, is simply
20 that Mr. Howden correctly described the role of the
21 regulator; the role of the licensee in this case and my
22 awareness of that is vivid. I'm accountable for safe
23 operations. There is nowhere else to turn. The buck
24 stops here and I understand that completely and I won't
25 compromise on that. And I won't compromise on that level

1 for several reasons, one of which I have an obligation to
2 you and other stakeholders and one of the key stakeholders
3 is the rest of the nuclear industry, and that's a well
4 known behaviour now throughout the nuclear industry. And
5 with my utility experience I know what they expect of me
6 here as well as what you have expected of me and I'm not
7 prepared to compromise that under any conditions.

8 In terms of moving forward, I'm not just
9 satisfied with a "C" or Charlie-level ratings, and I'm not
10 satisfied with "B" or Bravo-level ratings.

11 When we finally achieve, as I expect that
12 we will, alpha level ratings, I still won't be satisfied
13 with that because the only way to succeed in this industry
14 over the long-term is to be consistently raising the bar,
15 and consistently raising the bar within the management and
16 leadership of the organization, and placing the regulator,
17 the regulatory staff in a position where you can exercise
18 your oversight of our operations with confidence. That's
19 my commitment.

20 **THE CHAIRPERSON:** Thank you.

21 Well, you can imagine that the
22 responsibility weighs heavy on the shoulders on this side
23 of the table as well. So we accept that.

24 So thank you very much for the update. I
25 realize it's been a very long day for you. You came here

1 very early. So thank you very much.

2 We're going to go to the next item on the
3 agenda which is CMD 06-M64, and Mr. Howden gets to work
4 again.

5 The next item on the agenda, CMD 06-M64, a
6 report on Canada's Participation at the Joint Convention
7 on the Safety of Spent Fuel management and on the Safety
8 of Radioactive Waste Management.

9 Mr. Howden.

10

11 **06-M64**

12 **Information Items**

13 **5.1 Canada's Participation at the Joint**
14 **Convention on the Safety of Spent Fuel**
15 **Management and on the Safety of**
16 **Radioactive Waste Management**

17

18 **MR. HOWDEN:** Thank you.

19 Good afternoon, Madam President, Members of
20 the Commission. My name is Barclay Howden.

21 I'm here presenting on behalf of Canada's
22 Joint Convention Team as the head of Delegation.

23 The purpose of this presentation is to
24 follow up on Canada's participation this past May in the
25 second review meeting of the Joint Convention on the

1 Safety of Spent Fuel Management and on the Safety of
2 Radioactive Waste Management, or the Joint Convention for
3 short.

4 With me today are Mr. Don Howard, the
5 CNSC's Project Manager for the first and second review
6 meetings of the Joint Convention, and Ms. Julie Mecke, who
7 is the Project Manager for the third review meeting to be
8 held in 2009. These two people are my primary resource
9 persons working on this file.

10 CNSC staff is presenting the information to
11 the Commission Members for their information.

12 My presentation today will give Commission
13 Members a brief introduction to the Joint Convention, the
14 nature of Canada's participation, our plans for the future
15 and our conclusions.

16 The Joint Convention is an international
17 agreement governing all aspects of spent fuel and
18 radioactive waste management. Canada ratified the Joint
19 Convention in 2001.

20 The Joint Convention requires that each
21 contracting party produce a national report, respond to
22 questions raised by other contracting parties on the
23 national report and attend and actively participate in a
24 peer review meeting.

25 The first peer review meeting was held in

1 November 2003 and the second was held in May of this year.
2 Forty-one (41) contracting parties participated in the
3 second review meeting.

4 The objectives of the Joint Convention are
5 paraphrased here: to achieve and maintain a high level of
6 safety in spent fuel and radioactive waste management; to
7 protect individuals, society and the environment from
8 ionizing radiation and to prevent accidents and, if
9 necessary, mitigate the consequences.

10 The mechanism for achieving these
11 objectives is through the peer review of contracting
12 parties' national programs for spent fuel and radioactive
13 waste management.

14 I will now discuss the composition of the
15 Canadian Delegation Team. The Canadian Delegation to the
16 second review meeting was headed by myself. We had four
17 additional CNSC staff, two who are here with me today.
18 The remainder of the Canadian Delegation included other
19 representatives from NR CAN, the Low-Level Radioactive
20 Waste Management Office, AECL, Ontario Power Generation,
21 the Nuclear Waste Management Organization, AREVA and
22 Foreign Affairs Canada. In addition, Dr. Bruce Lange of
23 Atomic Energy of Canada Limited was Vice-Chair of Country
24 Group 5, which was the group that Canada was part of.

25 I would like to say that all provided

1 excellent support and resources to the delegation.

2 Canada submitted its second national report
3 by October 15th, 2005 as required by the Rules of the
4 Joint Convention. Following the submission of the second
5 national report, Canada received and responded to 115
6 questions from 17 contracting parties. This showed a
7 great level of international interest in Canadian
8 activities.

9 In particular, others were interested in
10 our long-range projects, our efforts at public
11 participation and in aspects of financial guarantees.

12 The national report and responses to the
13 questions are posted on the CNSC website in both official
14 languages.

15 In addition, Canada also peer reviewed the
16 national reports of other contracting parties and
17 requested clarification of several issues.

18 Next I will discuss Canada's participation
19 at the review meeting. An important part of the review
20 meeting was the peer review process. Canada formed part
21 of Country Group 5 and Canada was allotted one full day
22 for its presentation. The members of Country Group 5 are
23 shown on this slide.

24 Also, members of the Canadian Delegation
25 attended other contracting parties' presentations and

1 actively participated in the debates and discussion.
2 Canada attended 19 contracting party presentations
3 covering the G8, CANDU countries and a few others.

4 The key messages that the Canadian
5 Delegation conveyed during the second review meeting were
6 that Canada has a strong safety culture; spent fuel and
7 radioactive wastes are safely managed in Canada; Canada
8 has an open and transparent approach to the management of
9 spent fuel and radioactive waste; we carry out extensive
10 public consultation and Canada is actively addressing the
11 long-term management of spent fuel and radioactive waste.

12 Finally, Canada has the mechanisms in place
13 to secure the funding for long-term liabilities.

14 This slide outlines Canada's presentation.
15 Canada's presentation was very well received. As you can
16 see, Canada's presentation covered several projects which
17 were of great interest to the international community.
18 Although the presentation did not include uranium mine
19 tailings, a representative from AREVA was present and
20 responded to questions.

21 The Delegation, which included
22 representatives from the regulator, government and
23 industry, was seen to be a demonstration of an integrated
24 approach to waste management in Canada.

25 Some of the good practices that were

1 highlighted, the peer review of Canada's second national
2 report and the response package result in a number of good
3 practices. The highlights being identified are outlined
4 here.

5 In particular, it was seen that Canada has
6 a competent regulatory system with clear responsibilities.
7 Canada is implementing a sealed source tracking system and
8 mechanisms for funding for long-term liabilities are in
9 place or are being put in place.

10 The peer review process also identified
11 several challenges and planned actions. Many of the
12 findings were to ensure continued progress on several
13 initiatives and called on Canada to report on initiatives
14 in Canada's third national report and subsequent review
15 meeting in 2009. I will briefly highlight some of these
16 initiatives.

17 First, findings at the peer review also
18 indicated that in order for Canada to keep up its present
19 momentum, it will have to ensure adequate resources,
20 funding and expertise are in place. It will also be
21 important to demonstrate at the next meeting of the Joint
22 Convention that progress has been made on such things as
23 the Port Hope initiative, OPG's deep geological
24 repository, AECL's fuel packaging and storage project and
25 decommissioning of old structures and, of course, the

1 Nuclear Waste Management Organization Initiative.

2 CNSC staff will be providing a mid-term
3 status report on these challenges and planned actions in
4 the form of a regulatory status report that will be issued
5 in November of 2007.

6 The path forward. The preparation of the
7 Joint Convention Report is a valuable exercise which
8 compiles important information. Rather than expend a
9 great deal of effort all at one time, CNSC staff proposes
10 to keep the report as a living document. With this in
11 mind, CNSC staff will report on the status of spent fuel
12 and radioactive waste management in Canada, using the CNSC
13 contribution to the national report as a model.

14 The regulatory status report will follow
15 the format of the national report. The report would focus
16 on the progress and updates, focussing on regulatory
17 aspects since the previous national report.

18 When Canada prepares for the next Joint
19 Convention, these updated blocks would simply be built
20 back into the national report along with supplemental
21 information from industry and government.

22 The regulatory status report will be issued
23 once between the Joint Convention review meeting years.
24 The first regulatory status report, as I said, will be
25 issued in the fall of 2007.

1 The regulatory status report and
2 information from the Convention on Nuclear Safety, another
3 convention that Canada is a signatory, will assist in
4 preparations for the Third Review Meeting.

5 The following are some of the milestones
6 for the Third Review Meeting. In May 2007, CNSC staff
7 will be submitting the project plan for the Third Review
8 Meeting. Canada's third national report will be presented
9 to the International Atomic Energy Agency by October 2008.
10 The Canadian delegation will participate in the Third
11 Review Meeting which has been scheduled for May 2009. And
12 finally, following the Third Review Meeting, CNSC staff
13 will present to the Commission on Canada's participation
14 in the Third Review Meeting.

15 To conclude, Canada fully supports the
16 objectives of the Joint Convention and has put in place
17 measures to demonstrate the implementation of its
18 obligations. This view is supported by the feedback
19 received from other countries.

20 The Joint Convention provides a valuable
21 forum for benchmarking and, from our experience with the
22 Joint Convention, clearly indicates that Canada's nuclear
23 industry, government and regulator can work together when
24 it comes to enhancing safety.

25 On behalf of the Canadian delegation, I

1 wish to thank you for this opportunity to present here
2 today and we are now present to welcome any comments or
3 suggestions or questions that you may have. Thank you.

4 **THE CHAIRPERSON:** Dr. Dosman?

5 **MEMBER DOSMAN:** Thank you, Madam Chair.

6 I'd like to recognize the leadership of
7 CNSC staff in this process and compliment you on what I
8 consider to be a tremendously comprehensive report. And
9 I'm only dipping really into one aspect of it and that is
10 Table D.3.1 on page 20 and 21, which summarizes the
11 radioactive waste storage in Canadian facilities as of
12 December 31st, 2004, and it's most instructive.

13 I note that 85 per cent of the radioactive
14 waste is located at the Western Waste Management Facility
15 and the Chalk River Laboratories, and a full 10 per cent
16 of the waste is accounted for by the decommissioning of
17 the Whiteshell Laboratories.

18 My question to staff is, how accurate is
19 this inventory? Is staff confident that this inventory
20 accurately reflects the radioactive waste accumulation in
21 Canada to the end of '04?

22 **MR. HOWDEN:** Barclay Howden speaking.

23 I'd like to ask Don Howard to reply since
24 he oversaw the compilation of the data.

25 **MR. HOWARD:** Don Howard, for the record.

1 The gathering of the information for the
2 National Report was a collaborative affair with all of the
3 licensees or all the participants. So all of these
4 numbers were gathered directly from the licensees who
5 operate these facilities. So as far as we know of today,
6 as of December 31st, 2004, those were accurate numbers
7 coming directly from the licensees.

8 **MEMBER DOSMAN:** Thank you.

9 **THE CHAIRPERSON:** Are there any other
10 questions? Dr. Barnes?

11 **MEMBER BARNES:** A few. I really found this
12 a really excellent document, a good summary, certainly for
13 the likes of commissioners, it brought a lot of things
14 forward.

15 If I could just be a little devil's
16 advocate, I did feel it was still sugar-coated to some
17 degree. When I look for admission of challenges and so
18 on, there weren't too many. And the material that you've
19 put in, for example, which I realize is not just a CNSC
20 document, it's sort of a group effort here, but those are
21 all the diagrams that were provided by OPG at the scoping
22 of the EA.

23 It seems to convey, again, a level of
24 simplicity that the problem has been solved, which I
25 argued was a bit of a fault in that EA at that time. But

1 again, it has simply been transferred here. So someone
2 reading it would think that Canada solved the problem of
3 intermediate and low-level waste.

4 With the high-level waste, again, there
5 isn't really an admission that we're still waiting for a
6 real solution now to this from -- in government policy, I
7 would say here or probably Port Hope is discussed, but
8 without any mention, I think, at least in the overheads
9 that you provided of the public concerns, all right, which
10 I think have driven a lot of the issues to this point.

11 I just wanted to ask two questions. Did
12 you -- as the group going there, did you learn anything
13 substantially new from that convention to sort of bring
14 back and apply to this? And secondly, would you have
15 prepared and presented this material differently?

16 You spent a whole day and there was "x"
17 number of people in the room and so on. You obviously
18 spent a lot of time preparing this document, and with all
19 the view graphs, et cetera, this is a huge effort and it
20 occurs every now and then.

21 So what lessons learned did you bring back
22 in those two aspects?

23 **MR. HOWDEN:** Barclay Howden speaking.

24 I'm just going to give an introduction and
25 then ask Don Howard to speak to what we came back with in

1 terms of new stuff and the lessons learned and how we
2 might do it differently, and he's obviously going to be
3 transferring this to Ms. Mecke as we go forward. But
4 before I do, I'd like to just comment on the challenges.

5 As Madam Keen knows, because she chaired
6 these international meetings, you really -- you have to --
7 when you go to one of these meetings, there's a tendency
8 for everybody to speak nice and, you know, pump up what
9 they're doing well and maybe downplay what they're not.

10 When Canada went to the planning meeting
11 for this particular one and to the actual meeting, we
12 really strongly encouraged to the Chair that this a peer
13 review and let's do a proper peer review. And I would say
14 that when the -- I would say when the sort of the overview
15 is done, it's done at a very high level, but I would say
16 in our particular case, our country Chair, Mr. Blommaert
17 from Belgium, was a "roll up your sleeves, get down into
18 the nitty gritty" sort of person.

19 So I would say that there was a lot of
20 really good discussion within the country groups. When
21 you went you to plenary, it was much more high level, but
22 the message that we received was -- they said, "DGR, NWMD,
23 that's very nice, Canada". But you know, when you come
24 back, our expectation is that something will have
25 happened.

1 And you know, when we come back, our
2 expectation is that certainly DGR is progressing in front
3 of the Commission and we will report the good with the
4 bad.

5 Also, there was a lot of discussion on
6 public concerns and I think what really came out, which is
7 a very high level comment, is that many countries do not
8 invite the public to participate in the regulatory process
9 or any of their processes. A lot of them look at Canada
10 like they're going, "What are you doing" sort of thing,
11 whereas I think we came out and I think we really talked
12 about our transparency. We went through the process.
13 People from other countries who had come to Canada and
14 witnessed things said, "Yes, these guys are really trying
15 very hard".

16 But I think you have to understand that a
17 lot of countries don't encourage this and I think Madam
18 Keen, as part of her regulators group, really pushes this
19 very hard. So we didn't shy away in saying what was good
20 and what was bad.

21 Mr. Blommaert had participated in some
22 sessions with us previously in Belgium where we were
23 talking about how you engage stakeholders. So he was
24 aware of what Canada was trying to do and he was aware of
25 what other countries were trying to do. So there was a

1 lot of candid conversations; a lot of it doesn't actually
2 end up in the documentation.

3 With that, I'd like to pass it to Don
4 Howard to say what we learned from the waste management
5 practices and how we might do it a little differently next
6 time.

7 **MR. HOWARD:** Don Howard, for the record.

8 I'd like to voice, you know, Mr. Howden's
9 comments in that when we go to these international
10 conferences, it's a thing that a lot of countries don't
11 want to see the black marks against their country. And so
12 it's a lot of niceties, a lot of positive information that
13 is being transmitted and what we tried to do in this
14 particular one, recognizing this is only the Second Review
15 Meeting, so we're still feeling our way around.
16 Hopefully, down the road, things will start opening up.

17 But what we tried to do was put on the
18 table some of the issues that we are dealing with in
19 Canada, some of the problems that we are facing, some of
20 the solutions hopefully that we have in place. And I
21 think we had some positive feedback from the contracting
22 parties within our country group that they have seen that
23 the efforts that we're putting in are there, but they want
24 to see more progress at the next Review Meeting.

25 So that's one thing that we took back, is

1 they want to see more. One of the things that I
2 particularly noticed was this public consultation.

3 So one of the things we're thinking about
4 is that, you know, we took a team of regulator, government
5 and industry over, as part of the Canadian team to the
6 convention. We are thinking, and this is just preliminary
7 thinking at this point, is maybe having some community
8 member part of the team to come over and voice whatever
9 concerns that they may have about the system in Canada.
10 So that way it would be a first-hand approach.

11 To put into the report public concern about
12 various projects would almost triple the size of this
13 report at this point. What we're trying to do is just
14 outline what we're trying -- some of the ways in which
15 we're trying to address our problems in Canada with
16 respect to the long-term management of waste and spent
17 fuel.

18 So, at this point, we were taking back some
19 of the concerns that were expressed as far as they want to
20 see more progress because that is the international
21 thinking today is long-term management towards disposal.

22 So they see us starting off on that with
23 the DGR and the NWMO and the Port Hope Initiative and they
24 want to see more progress, more reporting on that next
25 time.

1 But again, as you say, Dr. Barnes, I think
2 there is the public concern component that is really not
3 reflected in a report and I agree. And how we do that,
4 I'm really not sure. We have to really look at that and
5 see how we can incorporate something like that into the
6 report.

7 **MEMBER BARNES:** Thank you.

8 **THE CHAIRPERSON:** Yes, but, you know, and I
9 think there's three members here that would love for the
10 decision to be (inaudible) but I think geologic deposit,
11 the repository so we could talk more broadly about that.

12 But I think reading of the transcripts
13 would give some sense that there are, you know, clearly
14 some issues facing communities that they're concerned
15 about.

16 I guess one of the things that -- this was
17 addressed a little bit by my colleague, is when I was the
18 Canadian head of Dell there, Canada got hammered on a few
19 things and I don't think anything has changed.

20 The classification system is still -- we
21 were hammered on the first one and we haven't changed
22 anything so I imagine we got hammered on that.

23 The systems approach to waste management,
24 you know, is still not there. We've been at various
25 hearings all over the country saying, you know, well where

1 does this -- this waste is going from here to here and
2 it's going from there to there and it's going, you know,
3 it seems like we just ship it around the country or
4 something or think it's going to be shipped or whatever.

5 So I guess what I think Dr. Barnes is
6 saying and maybe this is best handled in a technical
7 briefing or something, but I think what we're going to be
8 looking to you for is an analysis maybe that's not
9 completely homogenised in a Canadian setting or, you know,
10 or put into the international setting from Canada.

11 But a real clear analysis of what has to be
12 done and you know, what we have to do as a regulator to
13 move from here to there in terms of either international
14 standards or you know, regulatory approaches, holes in our
15 framework.

16 What are those things that we need to do,
17 either as CNSC staff or as a Commission to push this
18 forward, not to the denominator of you know, 40 countries
19 but to the denominator of a country that thinks it should
20 be at the top of the world. Well we are I guess, close to
21 the Arctic, in terms of this.

22 So that's what I think Dr. Barnes might
23 have been alluding to a little bit in terms of what did we
24 learn, is what are other people doing that's better than
25 us.

1 And then even if at this is, so what,
2 that's a B rating, you know, what does A look like for us
3 if we're really going to handle waste, I think, is part of
4 it.

5 Further questions from my colleagues?

6 Mr. Graham.

7 **MEMBER GRAHAM:** Just on that, we've got to
8 show progress by 2009 and we have some real challenges and
9 I guess to echo what the Chairman said and what Dr. Barnes
10 said is that do you feel that we are going to be able to
11 come forth with one or two substantive solutions to some
12 of these situations that you've outlined here today and
13 that are outlined in this very excellent report?

14 Do you think that you'll be able to at
15 least show some progress? I mean you're going into the
16 third session or third review. Mr. Howden, how confident
17 are you that you're going to be able to show some
18 progress?

19 **MR. HOWDEN:** Barclay Howden speaking.

20 I'm quite confident that we'll show
21 progress. As Madam Keen said, she's looking for --
22 exactly, but it's a strategy. Say okay, you've done some
23 benchmarking, you've done it twice and some things haven't
24 moved. I'm confident that waste classification will
25 actually be a success story in about a year's time. So

1 that will be a positive.

2 I think in terms of the systems approach
3 that's more of a challenge but we're working to try to
4 make that happen or at least influence that to happen.

5 So, I would say that we would be very happy
6 to provide a briefing to the Commission on a technical
7 basis in more detail, proposing, basically, a strategic
8 approach to filling some of the holes in so that where
9 we're doing well we keep doing it well and where we need
10 to improve we improve; definitely.

11 **THE CHAIRPERSON:** I think one of the
12 problems is that they -- it's we, the country, so the
13 answer is the NWMO is before the Government of Canada,
14 really, you know and there's not much the regulator can do
15 about that I guess.

16 Mr. Harvey.

17 **MEMBER HARVEY:** Just one question.

18 I won't ask you, Mr. Howden, to put an A,
19 B, C on our performance but is it possible to detect in
20 those meetings where we stand among all those countries;
21 among all the other 40 countries that were there or
22 parties?

23 **MR. HOWARD:** Don Howard for the record.

24 I guess in trying to compare ourselves to
25 other countries that's a difficult question to answer

1 because every country has their different programs in
2 place.

3 If we looked at it from within the country
4 group that we were in, with some of the countries that
5 were there, there was, you know, a small group. You know
6 we were -- I would say personally we were in the top part
7 of that country group.

8 When you're looking at it from the overall
9 convention, when looking at the various programs we have
10 in place, we are, you know, far ahead of some countries in
11 certain aspects but we are behind in others in other
12 aspects.

13 I think if you try to even it out I would
14 say we're in the top third.

15 **MEMBER HARVEY:** Not too bad. Thank you.

16 **THE CHAIRPERSON:** Further questions?

17 Well thank you very much for the update and
18 we'll look forward to, at the appropriate time, the
19 technical briefing on what can be done next.

20 Thank you very much.

21 We're just going to take a five minute
22 break while Mr. Jammal comes in and we close the room from
23 closed session.

24 --- Upon adjourning at 5:43 p.m.