



Legislative Assembly of Manitoba

HEARINGS OF THE STANDING COMMITTEE

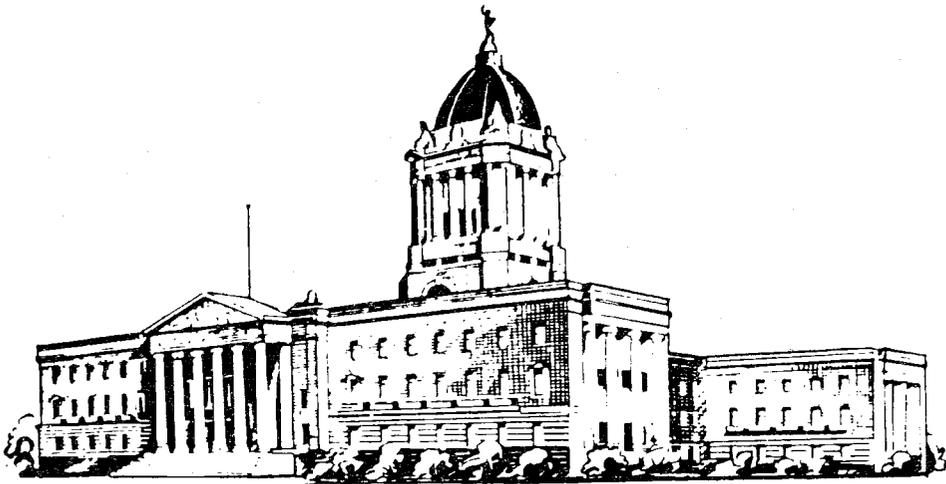
ON

PUBLIC UTILITIES

Chairman

Mr. Harry Shafransky, M.L.A.

Constituency of Radisson



10:00 a.m., Tuesday, April 6, 1976.

THE LEGISLATIVE ASSEMBLY OF MANITOBA
STANDING COMMITTEE ON PUBLIC UTILITIES

10:00 a.m. Tuesday, April 6, 1976

Chairman: Mr. H. Shafransky.

MR. CHAIRMAN: Order please. We have a quorum, we can proceed with the

. . .

MR. . . . Where is your quorum?

MR. CHAIRMAN: Count them. We're going to have the presentation of the Manitoba Hydro Board Report, 24th Annual Report for the year ended March 31, 1975. I'm going to call upon the Minister responsible for Manitoba Hydro, Mr. Schreyer.

MR. SCHREYER: Mr. Chairman, I have no opening statement, I think we should proceed just as in past years by calling on the Chairman of the Manitoba Hydro.

MR. CHAIRMAN: Mr. Bateman. I believe we will follow the same pattern, you will have your introductory remarks and after that we will have questions followed by page by page perusal of the report. Yes, Mr. Blake.

MR. BLAKE: Mr. Chairman, it's just probably routine, but the proceedings will be recorded and transcribed?

MR. CHAIRMAN: Yes. Mr. Bateman.

MR. BATEMAN: Well, Mr. Chairman, Mr. Premier, Members of the Committee, this year I am accompanied by various senior members of the staff of Manitoba Hydro who are here to assist in answering the questions that are raised by members of your committee.

Now if it suits the committee, Mr. Chairman, I will begin by reviewing our financial and system operation statistics for the fiscal year '74 - '75 which is the annual report for this year on operations that was tabled in the Legislature and copies are available, I believe all the members of your committee have copies before them. After reviewing the annual report I'd like to bring you up to date on the progress of construction and update you on our current financial and operating status and then from this lead into our future plans.

Approximately one year ago, I think the committee met on April 1 last year, I gave you a preliminary report on our fiscal year which has just ended and you now have the corporations annual report before you, so I'm going to review it very briefly. At the beginning of the fiscal year '74 - '75 a general consumer rate was implemented. The purpose of this rate increase was to keep the revenues in balance with expenses and reserve requirements. Total revenue increased by 26.7 percent to 129.6 million while the total expenses increased by 17.9 percent to 125.4 million. The excess of this revenue over expenses, the 4.2 million dollars, increased the total financial reserves of the corporation by that amount. Now I'm going to comment on the adequacy of reserve provisions later in my presentation. Increased revenue from increased extra provincial sales contributed about 7.8 million of the total revenue increase of that 27.3 million. If this extra revenue had not come from sales of surplus kilowatts or kilowatt hours to Ontario, Saskatchewan, and the United States, it would have had to come from our own Manitoba customers. Last year the extra provincial sales to those three parties I have mentioned was about 12.3 million; this year it amounted to 20.1 million. The increase in expenses consisted of 19 percent increase in net interest, 11 percent increase in depreciation, and a 21 percent increase in operating and administrative costs including the fuel water rentals and power purchased.

I'm going to show you some information to show you how these costs are increasing - if I can use this overhead projector. Perhaps while we're changing the bulb I'll just carry on with a few comments I was going to make about the capital construction charges during the year. They totalled 269 million, which was 34 percent higher than the previous year, and our major expenditures included about 56.2 million on the Lake Winnipeg regulation project, 57.8 million on the Churchill River diversion project and 81 million on the Long Spruce generating station. The purpose of financing the Capital Construction expenditures and refunding maturing debt during the year, or for purposes of doing this the corporation issued bonds in the total principal amount of 243.3 million and received an advance of 23.4 million from the Province of Manitoba.

(MR. BATEMAN cont'd)

The total amount of energy that was generated during the year to meet the requirements of the integrated Manitoba systems and for the extra provincial sales increased by 15.8 percent over the previous year. Diesel generation of electricity for the isolated Northern communities increased by four percent; overall consumption within the province increased by 3.7 percent. A firm peak demand of two million and 90 thousand three hundred kilowatts was recorded on January 21, 1975 which represented an increase of 4.4 percent over the previous peak of two million and one thousand five hundred kilowatts recorded on December 13, 1973. River flows during the spring and early summer on all our river systems were the highest on record in Manitoba. High flow conditions on the Saskatchewan River resulted in the highest annual generation and the first use of the spillway at Grand Rapids generating station since it was commissioned occurred. Lake Winnipeg registered new record high elevation during the year 1974.

Now we'll look at what is happening to our system this last year as far as financial matters are concerned. This first curve is the capacity that is in service and you'll see that it's now approaching the . . . this being the capacity in service and we are just short of the 3,000 megawatts. The net plant in service then is this curve here and you'll see that the net plant in service is just in excess of 800 and some odd thousand dollars. The energy generated for the year exceeded 14 billion kilowatt hours, the figure I have just given you, and the net interest for the year, one of our largest increases, you can see up in this area, just over 50-odd million dollars. And the labour costs in the year, put all these curves together, you can see them all now, and labour cost is in the order of 33 thousand - 33 million dollars, these are all in thousands, which represents why, these are two of the principle reasons why we've had increase in our rates.

Now how is Manitoba Hydro doing with these increases. If we look at the labour cost in mills per kilowatt hour you'll see that it's been doing fairly well in this last few years, '74 - '75 being here, and we have taken the effect of inflation out of this by dividing it by the consumer price index, to show that actually our productivity is quite satisfactory from the corporate point of view in usage.

MR. CRAIK: What labor was that, was that construction or operations?

MR. BATEMAN: That's our operating labour. And here is the number of persons that we have per billions of kilowatt hours. So you see that in the last few years we're holding our own despite all the added fringe benefits that have been given to staff and a shorter work week and so on, we're still holding our own in this measure of our performance.

One other important statistic that relates to our operations, and that is the weighted average annual interest rate. You can see that whereas back in '65 - '66 it was just five percent our average interest cost today, our average interest cost is eight percent and going up. Now if you look at this on the basis of the billion dollars that is on the budget sheet, on the financial statement you're going to review, that three percent represents for the billion dollars at eight percent, one percent on a billion is ten million dollars I believe isn't it? So here we have a 30 million dollar difference if we had the same investment at that point in time. Of course the investment has been increasing as well as the rate of interest which is why these interest costs are going up so rapidly, as far as the system costs are concerned.

Well now if we can go back to look at the Nelson River and its effect on our system this last year, the report you're reviewing, it supplied 53 percent of the energy generated during the year and thermal generation was required only for peaking operations during the winter months, and provided less than two percent of the total energy requirements. The Nelson River high voltage direct current transmission system reached a peak loading in excess of one million kilowatts in November of 1974 and approximately 4.8 billion kilowatt hours of energy were received at the southern terminal from this system during the year.

Now if we can extrapolate into the year that we've just concluded, as you know, we've just completed our fiscal year ending March 31, '76 and I'd just like to say a few words about some of the highlights that have gone before and try and relate those to the year under review by your committee, Mr. Chairman. For instance, in the last fiscal year we've signed two major collective agreements. One with the Allied Hydro council for

(MR. BATEMAN cont'd) the Henday, Limestone, Conawapa projects, and the second agreement was signed with the IBEW Local 2085, which is the construction unit covering contracted transmission lines on the Lower Nelson River between Henday, Long Spruce, Limestone and both these agreements are to remain in force until December 31, 1986 with a no strike, no lock-out clause in them.

In '74 and again in '75 shortages of skilled manpower were a problem on our Northern projects. Arrangements were made with Canada Manpower for offshore recruitment in some cases for carpenters, ironworkers and rodmen. Internally, no major difficulties or work stoppages were experienced, however. Last year was somewhat better relative to these shortages but they were still evident in our operations. Modifications to the cost-of-living adjustment formula were negotiated with the IBEW and with the MC unit which is our supervisor unit. The 18-month collective agreement with the Manitoba Hydro Employees Association expired on December 24, 1975. Negotiations for the purpose of renewing the agreement started in late October 1975 and third party mediation is now under way and the one unresolved issue is wages. Senator Goldenberg will be out later this month to mediate that agreement.

We have engaged outside consultants to help us in a comprehensive job evaluation study, and they are being assisted in this by Manitoba Hydro staff. The work on position charters and in other areas of wage and salary administration continues with special attention being given to the anti-inflation program. Reflecting our practices of staff development, more than 700 employees were promoted to higher responsibilities. Approximately 750 new employees were engaged and 250 students during the summer months. Peak employment was reached in July when 4,993 people were at work. Today we have 2,748 salaried employees and 1,700 hourly employees, for a total of 4,454, whereas in 1974, our year end in '74 which is under review by your committee, Mr. Chairman, we had 2,570 salaried employees and 1,617 hourly employees, for a total of 4,185.

Now with respect to our safety program I can report that there were no fatalities and only two permanent partial disabilities resulting from hand injuries. The overall accident frequency of lost time accidents per million man-hours was up from $8\frac{1}{2}$ to 9.93. However the rate is the second lowest recorded in the past six years. Motor vehicle accidents were also down. In view of the low loss claims Manitoba Hydro will receive a rebate of fleet insurance premiums. Fifteen fires resulted in losses of Corporation properties throughout this past year. There is an ongoing program to alert the general public of the need for electrical safety. We are sorry there were three fatalities to the public last year, two of them because faulty electrical motors were connected with only two wire extension cords. This is a message we must get across to the public, that you should not use an electric lawn mower without a properly grounded circuit.

I will now turn to consideration of the major projects which we have under construction, using some slides to illustrate what we are doing in northern Manitoba. This progress report will bring you up to, part way through the fiscal year we are currently considering and I'll perhaps just talk to these slides. I have the control for them over here. This is a map to give you a general orientation again, you recall that our program involves the outlet of Lake Winnipeg which is some 70 miles long, a series of channel improvements and new channels, and the Jenpeg Station, the Nelson River flowing North through Kelsey which is here, Kettle which is developed there, Long Spruce, Limestone and so on to the Bay. Churchill River rising in the West, in Alberta actually, just over the boarder, flowing through Saskatchewan into Manitoba through South Indian Lake. We stop it here with our Missi Falls control structure and limit the amount that flows down that route. We divert it through the channel here and control what can flow down the Rat and Burntwood Rivers into the Nelson River at Split Lake. Now that's a general orientation, we'll deal with these in more detail as we go along.

The Two-Mile Channel, I'll show you some slides how this is progressing, is right here, it will be completed this fall. The Eight-Mile Channel was placed in service last fall and we have a dam off here at Kiskitto Lake. Kiskitto Lake will be kept as a nature preserve, it will be regulated in elevation as its natural elevation and because it drained this way and the water here would be higher now we've had to put a dam in here and dig a ditch across here which I'll show you a slide of, to regulate the level of Kiskitto Lake. The Nelson of course flows up Playgreen Lake through the Whiskey Jack Rapids and then splits

April 6, 1976

(MR. BATEMAN cont'd) three ways. One through the Ominawin Channel here, which is this curved channel, which we have improved with a by-pass channel, two by-pass channels actually, and then the Metchanais Rapids and then the Kisipachewuk Rapids here which, this channel was improved. So we have a better distribution of flow because the flow now comes through the Eight-Mile and through the normal Whiskey Jack Channel and divides three ways into the Nelson River where it is controlled at the Jenpeg Plant structure, the control structure there and on down the Nelson. This east branch of the Nelson River is not controlled and does not have any significant change in flow from what a state of nature would be except that perhaps here there is a slightly higher stage due to the additional flow that can get out of Lake Winnipeg into Playgreen Lake. There's a normal hydraulic drop through here depending upon the elevation of Lake Winnipeg, this is now limited because of the additional channel capacity out of Lake Winnipeg.

Well here's the Two-Mile Channel, this is the centre line through the Two-Mile Channel before any work was done, this is looking toward Lake Winnipeg. Here is the Two-Mile Channel as it appeared last summer. This is the little airstrip, our construction camp and cofferdamming off the flow so we can keep the water level up for the dredging operation. And here is the Lake Winnipeg Inn where as you see we are getting well on toward Lake Winnipeg; however there is a transition zone to dig into Lake Winnipeg and a transition zone to dig into the Playgreen Lake area, but this gives you an indication of how the dredge - this is the large dredge here, 36-inch dredge - is performing. And this is the soil bank which will be later planted to timber. Here's a view looking the other way from Lake Winnipeg back toward Playgreen Lake, making fairly excellent progress, this face, about 20 - 30 feet high and you're digging about 20 - 30 feet deep, so there is quite a face of material to excavate by this dredging operation.

This is the Eight-Mile Channel, the entrance from Playgreen Lake, the airstrip and the little construction camp that was there to maintain the Eight-Mile Channel. This is the Eight-Mile Channel again looking on toward Kiskittogisu Lake. It turns around and goes into Kiskittogisu over this way. This is a closer shot of this dredge which is performing just at the Eight-Mile Channel. Here's a closer view of the dredge - and I want you to take particular note of this. I'll show you this piece of the dredge on the next shot. This is the cutter head that's down here and rotates and sucks the water in through these two large discharge lines. And there is the cutter head. This isn't a miniature garage here, this is a full scale garage beside the cutter head. To give you some indication of how big that operation was. Here's the Ominowan by-pass channel, this is a double channel, we kept a rock growing through the centre of it and this was all excavated by conventional means, it's not quite in service in this slide because the Cofferdam is still in place but since then this has been removed and it has been in service all winter, passing the Nelson River flow into the Nelson River. Now I mentioned just briefly that this is the Kiskitto channel draining into the Minago River, drains into Black Duck Creek and then into the Minago, and this is a wildlife refuge, as part of a by-product of the Lake Winnipeg Development Program. And here is the little control structure that regulates the level of Kiskitto Lake. Now here is the Nelson River, this was the flow through this way originally, this is the new dam that was built to divert the water through the regulating structure. This is the Jenpeg regulating structure and the powerhouse up in the background, the powerhouse intake is still Cofferdammed off, both the upstream and downstream sides, and will be until sometime later this year.

Here is the downstream side of the Nelson River regulating structure with the water coming through it, this is a fairly deep rock cut through here and you can see over in this picture the main dam is just being sealed on the Nelson. That's a look at the exit side of one of the bulb units, give you some appreciation of the size of these openings, there are fairly large hydraulic flows through these units. This picture that you saw last was looking up this way towards the unit that will be mounted in here, this is the bulb unit which is under erection right now, the water flows through here turns the propeller right here and these are gates which regulate the amount of water that gets through consequently the load, the generator is contained inside and the cables are taken up through the shaft, through the forks here. Now compare that to a conventional generating unit such as we have been putting on the Nelson River and so on, you see that the propeller is mounted vertically and the water comes through and out this way, it requires a much deeper

April 6, 1976

(MR. BATEMAN cont'd) excavation than this and that was one of the main reasons why we chose bulb units at the Jenpeg site.

Here is a picture of Waboden last fall showing the Russian machines coming in, this is just a general picture of some of the crates of material that came from Russia for the bulb units at Jenpeg. Here is one of the parts of the bulb units, this is the outer ring of the bulb here, this is the anchor ring so to speak, with the thrust plate I believe on this part of it, and this is on its side, it's normally mounted vertically but you can get some appreciation of how big that bulb type unit is that's going in the Jenpeg powerhouse when you look at these men and so on. These are the wicket gates in this part . . . This is another view of the part of the unit under erection and here is the nose cone which you'll see being lowered into the lower area here, very interesting time to see this plant. And here is another general view then of the map which I think I went over fairly detailed with you, we'll now look at some of the other parts of this program.

I think it would be interesting to you, Mr. Chairman, to know that the Jenpeg project which is currently nearing completion has an estimated total project cost of 260 million dollars, which is up about eight million dollars from last year. Now this of course does not allow for any delays in installation and we may have some delays in the installation of the Russian machines; they were scheduled for this summer, they may not be in until later this summer or fall which would of course correspondingly affect the cost on the project.

Well let's go on to Churchill River diversion. I did give you the three points, the Missi Falls Control Structure, the South Bay Channel and the Notigi Control Structure. We'll look at those as we go through it. A little closer view perhaps you can see on this view of Southern Indian Lake, we had to excavate across here. And here is the Notigi Control Structure, this representing a fairly long river, the Rat River.

This is an aerial view of Missi Falls, you can see the Falls right here, this is an island and we dammed this off and built our spillway structure in this part right here and that's in operation, we're in the process now of blocking this channel with a permanent dam. This is a shot about a year ago actually of the Missi Falls structure, which is now complete. This is a view of the same structure last fall showing the gates and the heads where it's going in to control the lifting of the gates and so on, this is rock channel excavation leading down into the Lower Churchill.

This is the barging operation of part of the camp, we had quite an operation supplying all the construction requirements for Missi Falls. All that material had to be taken in either by winter road or summer barge. This is a view of the channel from South Bay to the Isset Lake area, and this is looking upstream from Isset Lake. This is about a six-mile long channel and we are now down to just the last stage of excavation of this. You recall last year I told you we were having difficulties with the excavation of this material particularly in this area where we had some extremely damp plastine type material which posed a lot of difficulties in machine operation, this was a conventional machine operation, although this summer what the contractor did was move a dredge in here and dredged out all the very soft plastine material to get at the harder material which he has been able to work all this winter and of course bare the rock which had to be excavated. The rock plug is down in this area.

Here is a shot of some of that heavy equipment just bogging down, it took several bulldozers to move a scoop of this stuff out, so that's why last winter - the winter not past but the winter before being such a mild winter in the north the contractor had extreme difficulties. However, they're all overcome now and we will have this in service this fall. Now going downstream to the other end, this is the Notigi Control Structure and you see the Rat River came round here, we stopped it off with a temporary Cofferdam and you can see our transmission line on the way up to Laurie River. This is the Copperdam then that controlled the flow of the Rat, we actually impounded the Rat for more than a year and kept this construction area in the dry and our rock excavation channel through here and the main dam then passes right over the structure, as does the highway to Leaf Rapids.

This is another view of the Notigi Control Structure looking at the upstream side. You can see the main dam is taking shape here, not quite finished. This was a picture last fall. It is finished now. In fact this structure has been in operation since last fall,

(MR. BATEMAN cont'd) passing some of the water that was impounded from the Rat River system. The Rat River water has been released all winter to maintain adequate water levels at Nelson House and Thompson. Now if we go down the Nelson River and I'll show you a few slides of the Kettle and Long Spruce projects. Before we leave the Churchill River diversion, perhaps I could just give you an indication of the cost of that project now --(Interjection)-- We have a few notes here that I haven't covered, I'd better, . . . we have a few slides to show you of this reach, but there are a few other points on this Churchill River System and Thompson and so on that require some comment, for instance, the mitigation works along the route of the Diversion. During the past year, we compensated individuals and groups who have suffered some loss due to the effects of the Churchill River Diversion and the other works.

The principle of compensation payments relating past productivity of a trap line with future productivity of that trap line is being accepted with a good deal of enthusiasm by the trappers who are participating in the program. Direct compensation is being paid where there is a direct damage such as with homes, cabins, docks, water, pump house, etc. This has been achieved either by direct payment for a loss or damaged facility, or by replacement with a facility of greater or equal value. In February the Government of Canada, the Government of Manitoba and the Northern Flood Committee and Manitoba Hydro, signed an agreement appointing Mr. Leon Mitchell, Q.C. to mediate the dispute between Manitoba Hydro and certain registered Indians represented by the Northern Flood Committee. Mr. Mitchell has brought the parties together in an atmosphere conducive to resolving differences between the parties on the matter in which compensation will be made. Specifically, because of the Churchill River Diversion, the following actions were taken and at Southern Indian Lake they were not represented by the Northern Flood Committee.

Phase one provided for new homes and relocation of existing homes that were worthy of moving at the Southern Indian Lake settlement and this relocation and replacement of new homes is now complete. The phase two and three portions, which are the remaining number of homes, is well on the way and actually scheduled for completion this current month. Remedial work and reconstruction of various docks, fish plants and beaches, etc. is complete as far as South Indian Lake is concerned.

Now at Nelson House, which is on the Diversion route about in here, it's suffering a backwater effect from the flow of diversion water down the Rat and Burntwood Rivers, where it comes into Threepoint Lake and backs up into Footprint Lake. The Nelson House Reservation is on Footprint Lake and negotiations concerning the nature and degree of mitigation works at Nelson House has started. Now, dependent upon the outcome, construction is tentatively scheduled for completion by November of 1977. We're optimistic that we will be able to achieve what the residents of Nelson House want and reach a satisfactory settlement through the means of the mediation that is going on with Mr. Leon Mitchell, that I mentioned to you.

Now on the Burntwood River, that's upstream at Thompson, design for the reconstruction of the pump house is well advanced. Tenders for construction will be called this spring, with a scheduled completion date of, again, November, 1977. Tenders have been called for construction of a new water treatment plant at the Birch Tree Mine, scheduled for completion by November, 1976, and these structures are right in this reach of the river here, near Thompson. The Thompson Pump House water intake has to be adjusted, as does the Birch Tree Mine and Water Treatment Plant.

Design for an ice control structure at Manason is progressing very well, with construction scheduled to take place this summer, and the object of the Manason rock weir or ice control structure is to create an ice cover upstream of the area so that we do not get the frozzy ice formations and icebridges occurring in the Thompson reach, which could cause concern about water levels in the Thompson pump house area.

Now at Churchill, which is just off the map up here, design for the reconstruction of the water intake, which is about four and one-half miles upstream from the existing intake of the water supply pump house, and the new water treatment plant is under way. Construction is scheduled for completion again by November, 1977.

Now the estimated cost of all these mitigation works, which had not been well defined last year, are now estimated to be in the order of 27.2 million dollars, which brings the estimated cost of the Churchill River Diversion project, including all the mitigation

(MR. BATEMAN cont'd) costs and the 11.4 million dollars that were spent in previous studies and explorations, to the total sum now of 206.4 million dollars. The estimate that I gave you a year ago was 170 million dollars, but did not include the mitigation works that I have just outlined, and I mentioned it last year that it did not include the mitigation works.

Now let's look at the Long Spruce project. The first unit of this ten unit plant is scheduled to be in service by July 15, 1977 and the last unit by December, 1979, adding a total of 980 megawatts to our system. Before we look at Long Spruce, some of you perhaps haven't seen this, but this is the completed Kettle project and it's very similar to what you'll see if you had looked at the artist's conception, it's a very fine plant and I'd like to extend an invitation, Mr. Chairman, to members of the Legislature to visit the Kettle Plant, the Radisson D.C. Control Station and the new construction that's under way at Long Spruce and the started Limestone for some Saturday, say the first Saturday in July. We could arrange a chartered trip and I'll leave that with you to convey to the members of your Committee and the members of the Legislature and we'll make the arrangements.

Now looking next at Long Spruce - Oh, this is the Radisson, just in moving away from Kettle, the power there, of course, is all rectified in this. This is the Radisson rectifier station, the power coming over from the generating station this way. This is the switchyard, the converter transformers and so on; and these are where the rectifiers are, and the power goes out of this station, then around into Winnipeg non-stop, 560 miles to the south. We have a -yeah, here's the non-stop route to the south, D.C. transmission, two lines from Radisson to Dorsey.

Now, I'll just show a slide or two of Gillam before we move on into Long Spruce. This is the recreation building at Gillam. This is the original C.N. Station, and these are some of the little dwellings that were in the Town of Gillam, although some of them have changed quite considerably from when we started to rebuild the town and these are C.N. homes here. The main construction area, or the new townsite area is that way and over this way now. And here's a view of some of the homes and trailers in Gillam. You notice that a little grass and peat moss and fertilizer makes an entirely different view, when you get some nice lawns, it has an entirely different view and that is a very pleasant little town now.

Now, in moving down to Long Spruce, this is the construction campsite for the Long Spruce Project, which is in the background here. This is the Cofferdam with the train and the marshalling yard for contractors' equipment and so on - looking at the Cofferdam which is in the river, more than half the river, and the powerhouse going across here and the spillway here. This was taken two years ago. This is a little shot that winter, you can see the spillway up. Since then we've made more progress. We now have the spillway in operation and actually these are specially designed openings in the bottom of this spillway to limit the amount of water upstream and this permits the powerhouse construction to go on and yet still get across to the dam area, which has to be completed across here this summer.

This is a view of the powerhouse construction going on last summer with the water coming through the spillway. And I'll just show you now a series of shots taken late last summer. You can see the spillway in here, the administration area, unit number 1, 2, 3 and 4 super-structure is up. The other units have been progressing throughout this last winter. This is the main dam which is folded into this earthfill material here, which has now been raised up to this elevation as of last fall and the object now is to build the other parts of the dam this coming summer.

The general view - give you some idea - here's a man. These are pretty mammoth openings. There's another man there, another man here. These are again some men in that slide. This is the opening exit of number 1, 2, 3 and 4 and so on. Again, this gives you a better scale. Here's a truck and here's a big semi-trailer. Now this is the inside of the powerhouse. This work has been going on this past winter and unit number one is just about complete up to the top as far as the concrete work is concerned. The installation of machine parts will be under way very soon. Number 2 unit, slightly behind, of course. Here's a man kneeling down and a man standing - give you some idea of the scale. This is a picture looking down from the walkway across the side of the

(MR. BATEMAN cont'd) powerhouse. This has to have concrete come up and this is just a little more advanced than the number three unit, which you'll see here. Now this is looking down on number three. The water comes in around here and in through all these openings and around in here. See, it's joined at this part. This is called the scroll case, it's shaped like a scroll and that's where the water flows into the wicket gate which you can see here. The stay veins, the upper and lower stay vein rings are just in the process of being mounted in this part of the picture and this will all be covered with concrete over this whole thing, allowing the water passages, which are quite large in size. The wicket gates themselves sit in these openings here and the lower bearings are in these openings in the concrete. Now, just a shot. Before you saw some pictures with the spillway in use. Here's when the spillway was breached last summer, this is the upstream Cofferdam just being breached. This all had to be removed in order to make the water flow through here. And these are some dissipation blocks in the downstream side to help dissipate the energy so that the discharge through here would not wash away our downstream Cofferdam and our bridge, which is down here, you can just see the piers.

And here, on the other side of the river, as we opened up that Cofferdam, of course, we closed this Cofferdam here and now divert the river through the main structure. And here's the last phase of closure of the Cofferdam. Here is a general picture of the dikes on the Long Spruce project. There isn't a great deal of diking on this job but there is a dike on the south side and one on the north side, which contain the headwaters of the Long Spruce project. This is the artist's conception of what it will look like when it's finished and I am sure it will look remarkably close to that.

Now before we get into this slide, I'd like to just explain that the first unit of that plant, as I said, will be in service in July of 1977. So it's an interesting stage to visit the station this summer. And the total estimated cost of Long Spruce is 501.4 million dollars - which is the same estimate, I believe, I gave you a year ago - which is made up of 270 million dollars for the direct items and 231 million dollars for the indirect items; and of those indirect items, it is interesting to note that 44 percent of the indirect items will be capitalized interest or interest during construction.

We have a number of additional sites on the way that can be developed. You can see Kelsey, that's developed, and Jenpeg is developed. Bladder some day. Kettle has been developed. There are two smaller sites there, and we are actively engaged in this one. We are just on the verge of starting work on this one, some work is under way. And then we have these two sites downstream at Conawapa and Gillam Island, which will complete the Nelson Development. And then we have got Notigi, . . . Madason, First Rapids on the route of the Diversion, which will be worked in in the next few years. Now construction of the main access road, this is the main access road from Long Spruce to Limestone Henday project, is progressing with the sub-grade nearly complete. Major drainage structures have been completed, including the twin multiplate arch culvert at the Limestone River. And work on the initial phase of the main camp, which will accommodate about 800 persons, was completed and persons from the temporary camp have been moved into the permanent camp facilities. Recreation facilities for the camp, consisting of a curling rink and a combined billiard hall - sports centre are on order. Design purchases and transfers of buildings from other sites are being formalized to bring the size of this camp to 2,200, to accommodate 2,200 men by 1979.

Work on the Sundance townsite has commenced with street construction in progress and a tender is presently being called for the construction of the first stage of both the school and the shopping centre. Fifty double wide mobile homes are on order from Viscount Trailers with construction of these getting under way in their Morris, Manitoba plant in mid-January of 1976. Other townsite buildings and services are being planned. A 2,000 foot airstrip was completed in late summer of 1975 and scheduled air service via Lamb Air started in January of 1976.

The stage one Cofferdam will start in 1976 with completion in 1978. That will take three summers to build that Cofferdam. The present in-service date for first power is 1983. This is a delay of two years from a year ago, as a result of a review of our estimated Manitoba load requirements and other matters. But I will be referring to this later in my submission. The award of the general construction contract for Limestone is not scheduled for another two years and so up to that date the in-service date of first

(MR. BATEMAN cont'd) power can continue to be reviewed in light of the expected growth in Manitoba's load.

So let's look at a few of these slides on the Limestone project. I have mentioned this twin arch culvert that has to go into the Limestone River. This is the Limestone River flowing into the Nelson River, the permanent construction camp area, the Sundance townsite is down here, downstream and the temporary construction camp was upstream of the Limestone River, the temporary camp which was accessible from the C.N.R. Railway, which you see in the right-hand side of the picture. Down closer at this arch culvert, this is a fairly significant undertaking to provide for the flow of the Limestone River and this gives you an idea of how large those culverts are. And this is the permanent construction camp again. Now, looking at the general layout, the main dam is across this part of the river right here. This is where the Limestone project will go and the D.C. Converter Station, the Henday Converter Station, will be in this area right here. We are taking the power by direct current to Southern Manitoba to Dorsey and it's more economic to have the D.C. station here than it is to have it at Radisson, where we have to move all of this power to Radisson, as it is now we just have a minimal amount of collector line interconnecting the various generation plants.

This is a view of the river on the south bank showing the ice still in place, I think this was last June, this is the small construction exploration camp to do some of the field explorations over the winter periods in the Limestone area to determine foundation conditions, etc. This, you have to see this to appreciate it, it's the ice in the Nelson River at the Limestone site. And this is the Bay, the plant will be across there and this Limestone River flows in here and around this Bay. This ice in this part of the river was between 40 and 60 feet deep as it bunched up into this river, which is going to present some very interesting and unusual construction problems on the Limestone project.

Now here's downstream from Limestone, the Conawapa site, this is some field exploration work drilling in the riverbed to try and get the foundation material information before we can design the plants and that was under way last summer. Here's part of the exploration camp on the Conawapa job; the only way to get around in that part of the country is by helicopters. Well now perhaps we could have the lights on for a while, show some more slides a little later.

The total cost of the Limestone project, which we had originally scheduled for 1981 was in the order of \$750 million. The two-year delay and the increase in costs generally including the interest during construction and higher costs for all phases of it, we now estimate the Limestone project will cost us in excess of 1.1 billion dollars. Now one of the other reasons for delaying the Limestone project was to count on purchasing the energy and capacity we would need in the winter of '82 and part of '83 from the U.S. interconnection that we planned, 500 KV U.S. interconnection that we are planning with Northern States Power Company - and I'll talk more about that later.

If we were to think in terms of the dollars and inflation not continuing, if we could think in terms of dollar staying constant at 1970 values then it would put this 1.1 billion dollars into perspective by saying that the Limestone Plant will actually cost less in 1970 dollars than the Kettle Plant because we don't have as many other things to do. We are in the Nelson River area, we have townsite and so on, although we are developing a temporary townsite at Sundance. Well now the high voltage direct current transmission system which is delivering this Kettle power to the South is now nearing completion as far as Bipole I is concerned. For Valve Group 5, all the material has been delivered and installed except one 300 KV transformer which is located at Dorsey. Due to the late shipment of this transformer the equipment will not be placed in service now until May of 1976. Valve Group 6, which will complete the Bipole, delivery is continuing and construction is in progress and we anticipate that that will be in service later in 1976 or early '77, perhaps early '77. The latest estimate for those two Valve Groups is 61½ million dollars, which is up 1.2 percent over the 1974 November 1 estimate which I gave to the committee last year. Bipole II, the stage one, which I told you a great deal about last year of 900 megawatts increase in the transmission capacity scheduled to be in service by November 1, 1978, the major equipment contracts have been let, the site preparation work, camp roads, fences, water and sewer and construction facilities have been completed; and Stage two and three for each 450 metawatts are scheduled for April 1, 1983

(MR. BATEMAN cont'd) and 1984, respectively. The estimated cost of the second Bipole is 422.6 million dollars, which is practically unchanged from the 422.4 million dollars which was given in 1974. Other facilities such as Radisson, Long Spruce, Henday, 230 KV transmission lines and a switching station and the collector lines and the 450 KV DC line between the Henday, which is the new convertor station and the Radisson station, which is the one I showed you the picture of, is under way. We also have an alternative microwave route from Henday to Dorsey with an estimated cost of 41.3 million dollars, including the lines and so on, that I've mentioned. Now the in-service date for these facilities are scheduled to allow utilization of the main high voltage DC facilities in conjunction with the generation capacity additions at Long Spruce and Limestone as they are scheduled, and we will not schedule any DC equipment until it is needed to meet the generation installations.

Well now, Mr. Chairman, as far as the large construction projects are concerned I think that concludes the remarks I'd like to make about them; I'd like to give you a few comments now on our operations for the year which you've just ended. We have a few operating statistics that are available and of the 14.9 billion kilowatt hours that were generated this last year 95.6 percent or 14.25 billion were produced from the hydro-electric plants in Manitoba. You'll note, if you're examining that in comparison to your report, it's a drop of about two percent from the '74 - '75 fiscal year in spite of more generation on the Nelson River. The balance of the total energy came from our thermal generation and a minor portion from purchases.

The total export sales were 3.19 billion kilowatt hours which is 10.1 percent less than the report that is before you. We also purchased 73.1 million kilowatt hours. Our sales revenue is in excess of 20.7 million on those exports sales. That's for less energy we made slightly more money; 20.7 million this year against the 20.2 million in the report you're considering, with ten percent less energy sales.

On the Manitoba integrated system, the firm peak on the fiscal year '75 - '76 occurred on January 7 at 1746 and it was 2,253 megawatts which exceeded the previous fiscal years peak by 7.8 percent. We have certainly returned to the trend line this last year. Now the energy increased by 4.68 percent, it's on the upswing, after a very slow early part of last fiscal year the energy sales have been increasing significantly. Our diesel isolated plants are up about four percent. Now these increases in our electrical demand represent a doubling within nine years which is somewhat faster than the long term doubling in ten years that we have experienced. River flows on the Winnipeg and the Saskatchewan River while medium or larger did not permit quite as much electric energy generation as in the 1974 - '75 fiscal year. Winnipeg River flows were below the capacity of most Winnipeg River Plants in Manitoba from August to December '75 resulting in 2.5 percent drop in energy from the Manitoba Hydro's Winnipeg River Plants. Now in contrast to that the Winnipeg Hydro's Plants increased by 6.2 percent. The explanation for this is the small capacity of the Pointe du Bois plant together with the large head losses associated with the 1974 flood that occur at the Slave Falls Plant. With optimum river flow conditions you get more energy out of the river.

Now the Saskatchewan River flow at The Pas was substantially below the Grand Rapids Plant capacity and much below the 1974 flood. This resulted in a reduction of electrical energy output from the Grand Rapids Plant. Nelson River flows continue to be high thanks to the storage effect of Lake Winnipeg and the energy production from Nelson River rose to about 58 percent of the total hydro-electric energy in Manitoba, which is a very significant number; 58 percent of our electrical energy this fiscal year just ending came from the Nelson River. Noteworthy that for the first time since our U.S. interconnection was commissioned in 1970 that scheduled imports in the U.S.A. have been made. Imports have generally been made overnight when it has been more economical than to generate with our own thermal plants. And as I mentioned, we purchased some 73 million kilowatt hours over our various interconnections. There were no major wind or sleet storms during the year however summer electrical storms were more active than usual resulting in a number of minor interruptions to customer service.

The performance of our Nelson River high voltage DC System has continued to improve, and as I mentioned earlier, we expect the additional Valve Group to be installed shortly. These additional Valve Groups of course will also improve the reliability of the

(MR. BATEMAN cont'd) Nelson River high voltage DC System apart from increasing the transmission capacity. In the past few years we have been very fortunate in having been able to generate nearly all of our electrical energy at our hydro-electro plants, thanks to very favourable weather over the drainage basins, favourable that is for precipitation. This enabled us to obtain substantial revenues from extraprovincial sales and also kept our fuel costs extremely low. Now we are, however, very concerned at the rate of increase in the cost of our coal supplies. As you know, we are burning Saskatchewan Lignite in our steam electric plants and I'm going to show you a couple of graphs which illustrate for you the increased costs that we have to pay. Power off again? Well while he's trying to fix that I'll show you these bits of information later. But the price at the pithead for coal has increased about 5.68 percent compounded annually over the last nine years, but the escalation was 9.5 percent from October 1, 1974. Now the freight to Brandon increased by 73 percent in the nine years, averaging 6.18 per annum compounded, but jumped 15.1 percent from March 19, 1975 to January 1, 1976. Now if we think Brandon was bad enough, which is on the CPR line, the freight to Selkirk which is on the CNR line increased at an average rate of 12.5 percent over the past nine years; but the increase from March 19, 1975 to January 1, 1976 was 40 percent. Now I'm glad we aren't burning much coal. With only a $4\frac{1}{2}$ percent of our total electric energy being generated at thermal electric plants the increased cost of delivered coal has relatively little impact on the operating costs in normal years. In dry years, however, the increase in operating costs will be large and will come at a time when extraprovincial revenues are also bound to be low. The effect on our revenue requirements would be significant. In fact, if we had to raise all the funds to burn all that coal we'd of had to make our rate increases substantially greater than we have. This gives you an indication of our coal cost at the mine for the first 300,000 tons. You see it has been going up gradually. Freight to Brandon has made a rather continual increase, but freight to Selkirk, you can see how it has taken a very substantial jump. The effect of that is to have the cost of coal delivered at Selkirk in this order. You now see we're projecting this beyond 1976, this is what we have been told we can expect in the next two years, and you'll see that the cost of coal is going to be between 13 and 14 dollars a ton at Selkirk and around \$9 a ton at Brandon. I've told the CNR that that's a way to discourage us from burning coal at Selkirk. It's cheaper to burn it at Brandon.

Now our load growth is still of some concern to us and in order to provide the required expansion of our facilities, like new hydro-electric generating stations and thermal electric stations, the transmission lines to bring the electric energy to the load centres and the distribution system that is required to bring the energy to the individual customers, we require estimates of the load growth made many years in the future. Forecasting of this electrical growth has in past mostly consisted in the extrapolation of growth patterns of past years. The electrical energy requirements in Manitoba and in many other regions of the world grew an average rate of about seven percent. There were of course periods of years when the annual growth rate was much less, like during the depression of the 30's, and of course there are periods when it has been much more. Foreseeable exhaustion of Canadian natural gases and oil reserves and the earlier temporary shortages of these in various applications where electrical energy can take place often at energy savings is certainly leading to an increased pace in conversion to electric heat, or electric energy for those other uses for which the fossil fuels have been put. On the other hand, the cost of electric power is also increasing faster than before. Now these two opposing influences make any forecast of electrical energy and power demand growth more uncertain than in the past. We have a continuing program of reviewing the expected load growth that will be experienced as a result of the needs of Manitoba users. Our past load forecasting success has been reviewed and the results are presented in this graph. Here I have a graph of the Manitoba System forecast comparison. Now we have to think in terms of when these forecasts were made. Green is the eight-year forecast and the red is the five-year forecast. So five years before this we made this forecast; five years before that and so on. Now you can see what the actual load has been and we haven't yet had a load that has been less than what we forecast. And that's the Manitoba system forecast comparison.

Now in the southern system we've had many more goes at it. We used to do a

(MR. BATEMAN cont'd). . . . ten year forecast as well as a five-year forecast and so on and you can see back as far as '66-'67 which was the year that this peak occurred, actually exceeded the five-year forecast that was made before that. And so on it has been. It's rather an interesting exercise to compare what has been with what you thought might have been. Total energy requirements have grown slower than the electrical energy requirements. If we think in terms of what is happening in the total energy picture in Manitoba, for example, electricity at these rates of growth, which are in excess of seven percent, are taking a larger share of the energy market each year. In the next ten years, electricity share of the total energy market may increase significantly above what it is now, in fact it could approach the 30 percent level; the other fuels making up the balance of the energy requirements in this province.

There are many factors that influence the growth of electrical energy. Population growth is probably the factor which comes first to your mind. And what has the population done in the last five year period? It's grown 2.5 percent between '66 and '71. That's the year for which I have records. In the same period, our electrical energy consumption in Manitoba grew by nearly 63 percent. That means that almost 93.5 percent of the experienced load growth was attributable to other factors than the population increase. Of great importance among some of these increases, of course, is the trend toward electric heating. Now I have some other information here on how electricity relates to its competitors - oil and gas. You can see what's been happening in the rates of gas, the rates of electric and the rates for oil. They're all going up.

Now how do they compare with the consumer price index? You'll see that the consumer price index has been going up faster than all of these products except oil, and that's based on 1961 at a hundred. This is back to 1949, 1960. We might ask ourselves what's going to happen to some of these other costs in the future and I look at this with some concern. This is what we estimate the price of natural gas. Well this is what it has done. This is the short cut-back here. This is the anticipated increases that we are advised the Federal Government are anxious to see happen to bring gas into line with the price of crude and you can anticipate \$3.00 an MCF, but just when that occurs, my bet is that it will be as early as '78 and other people are betting a little later. That's going to put a tremendous additional strain on the electrical system. I think the importance among the factors that effect our load growth of course are going to be the trend toward electrical heating, an increasing degree of saturation of households with electric energy using appliances, the supply and the price of fossil fuels, concern about pollution, the energy policy of the senior government, etc., as it will effect what that price does.

Many changes towards energy conservation including the conversion to electric power require time and capital investment. I realize that the faster the growth of electrical energy and demand occurs, the faster the plant mix changes from the older plants to the newer and the more expensive plant. Rate increases are needed sooner than would be the case with slower load growth. Should we then discourage the use of electric energy preferably to just load committed facilities? And to answer this question responsibly, we have to look at the alternatives to using electric energy in many applications. We can be certain that total energy demand will continue to grow in the face of decreasing supplies of oil and gas. Coal is inconvenient to use in many applications. In many cases, i.e. residential heating, the fossil fuels are used much less efficiently than electric energy would be used. The answer must then be that increased electric energy use conversion from fossil fuel to electric energy should be vigorously promoted wherever applicable in the interests of energy conservation to reduce the outflow of dollars for oil and gas imports, to reduce pollution and other effects on the environment. And if we look at a couple of additional average costs of our electric rates over the last number of years - now I would like to emphasize that these are average unit costs. You can see that our average unit cost in the rural areas has been coming down, and the Winnipeg suburban area the rate increase in '68 and again tapering off. Now I think you could say the honeymoon is over. We are going to see these costs going up.

Our general service, the same pattern. Our average unit cost of power, electricity used in power applications. We now have a standard power rate that's applicable throughout the entire province. The reason why this looks like the rural cost is lower than the suburban cost is because it relates to the amount of use by the various customers. You'll find the larger power user is in the rural area as opposed to the big industry in the city. There are small industries in the centre, use less power and have a

(MR. BATEMAN cont'd) slightly higher unit cost. But the rate structure is identical for these two units. But again you can see the honeymoon is over. These costs are going up. Now I had an average cost of electricity on farm use, again it's followed the same traditional pattern of down because of the greater use of the product.

Now looking at how all of these fit together over the last number of years you can see that the average cents per kilowatt hour and the various classifications - power rural you've seen that curve and so on. But our average costs, residential Winnipeg, suburban, are down here less than 1.6 cents which is a very competitive energy cost. Now if you were thinking of rate increases and think of our freight rates and our coal costs, I'm glad we don't use much coal or these rates would be significantly more than you have experienced.

To provide for the growth in our electrical energy demand in Manitoba - and perhaps we could have the lights on now for a period. I said earlier that first power is coming out of Jenpeg this year, some time this fall, Long Spruce as the next source, in '77, with full development by 1980. A commitment was made in September of 1975 to construct the Limestone Generating Station as the next source of generation in Manitoba, with first power scheduled for the fall of '83, two years later than previously planned, with completion to a total capacity of 1,100 megawatts by late 1985. The postponement is made possible by the agreement of a seasonal diversity exchange of 300 megawatts with Northern States Power Company utilizing the proposed 500 KV transmission line between Winnipeg and Minneapolis, and the reduction of load increase that we have experienced in this last two years. Future plans involve the development of the full potential of the Nelson and the Burntwood Rivers. As I mentioned earlier, well over half of Manitoba's electricity is being produced on the Nelson River and within less than five years, 65 percent of Manitoba's electricity will come from the Nelson River. This mighty river is without question Manitoba's greatest power resource.

Now beyond Limestone Generating Station, no decision has been made as yet to the source of electrical energy for meeting Manitoba's growing demand. We have two basic alternatives. The first would appear to be continuation of the original plan for Nelson River development. That is develop Conawapa and Gillam Island sites downstream from Limestone as fast as the projected load growth demands. Each development would be comparable to Long Spruce and if we assume historic load growth, the added capacity would take care of Manitoba's additional electrical energy requirements until about 1989 or 1990. That's one of the basic alternatives. There are sub alternatives to that such as perhaps developing some of the smaller plants earlier. Now such a decision involves some major problems. Construction costs are escalating at a staggering rate, particularly in the north. This is not just Manitoba Hydro's experience. This is the experience of every major project in Canada's north. Now each of these two plants that I've mentioned would cost well over a billion dollars compared with the \$320 million for Kettle. In addition, any further generation in the north after the Limestone Plant will require additional transmission capacity to deliver the power to the load centres. This could involve another direct current transmission line of about 500 miles of length and appropriate conversion equipment with a probable price tag of several hundred million dollars. Development of the Burntwood River sites and of the remaining lower head sites on the Nelson River together with the thermal peak load units or equivalent purchases would take care of a few more years say into the early '90s.

Now the second alternative and the one which is receiving a thorough examination is nuclear power. We have engaged consultants to identify problem areas and to provide data to help determine the location of this next major source of generation. We have also begun a program of monitoring existing radiation levels at various points in the province. The reason for such monitoring is to provide some base data of the present radiation levels. In other words, what is the ambient level of radiation in the province. I might say that Manitoba is the first province that has undertaken an ambient radiation level program in the development of nuclear as a fundamental to our requirements to know what this is. Now I'd like to stress that there has been no firm commitment made by Manitoba Hydro with respect to nuclear generation. We have at least two years and possibly longer before we must make a decision, and this period will be spent studying the problem and observing the experience of other utilities as well as getting data on

(MR. BATEMAN cont'd) , potential sites. Continued development of the Nelson River will require additions to our High Voltage DC Transmission System, and as I said earlier the first Bipole of mercury arc converters is scheduled for completion this year. Continued development of the Nelson will require additions to be made to that system. And I outline to you that Bipole II is under way, has been ordered and the first stage will be in service in '78 and the balance associated with the Limestone plant.

Now if we assume Conawapa and Gillam island are developed on the Nelson River, we'll need a third Bipole of converter equipment. The associated 500,000 high voltage DC line will be approximately 620 miles long because we're further down the Nelson. That is if it parallels the existing transmission line. But that route would make Manitoba vulnerable to an outage of the three lines. For example, a severe thunderstorm could cause a complete blackout for several hours. A tornado or an ice-storm could perhaps cause a blackout for several days. Consideration is therefore being given to the shorter or 500 mile route east of Lake Winnipeg. Development of EHV transmission in the AC load is entirely within the province, that is the development of EHV transmission, that 500 KV within the Province of Manitoba, is planned to be in service for 1983 and this involves construction of a 500 KV line from Brandon to Winnipeg. A second line will be built in 1986 and it is planned to operate these two lines initially at the 230 KV level until the load in the later '80s justifies the higher voltage operation.

Expansion of the high voltage transmission system to serve the growing needs of the province will continue and over the next ten years about 700 miles of additional 230 and 115 KV transmission system is planned, with the majority, about 650 of it, being at the 230 KV level. The 115 KV underground system will be expanded with about 10 miles being added in the next ten years, all in the metro Winnipeg area. Preliminary discussions currently in progress indicate that there is a possibility that between December of 1977 and May of 1978, Manitoba Hydro would supply Trans-Canada Pipelines with electric energy to drive compressors on their pipeline at Edwin, Manitoba. At that time Trans-Canada Pipelines would convert one of their turbine drive pumps from gas drive to electric drive. Now if experience proves satisfactory to Trans-Canada, they expect to convert other pumping stations to electric drive although they are experimenting with higher rated gas turbine drives. Now if they were to convert to electric of course this would conserve natural gas for use by other, perhaps more important uses.

Now I'd like to turn to interconnections, Mr. Chairman, because I think that by reviewing the interconnections that we have and those which we have currently had some news comments on, particularly the one that was subject to the public hearing in Winnipeg in January before the National Energy Board will be useful to your committee. In the period of 1971 to 1973 Manitoba Hydro negotiated with the Minnesota Power and Light Company of Duluth, Minnesota to obtain a second U.S. interconnection for Canada in order to improve Manitoba's system reliability in Manitoba and to provide economic benefits similar to those that were obtained from the first interconnection. In June of 1974 Manitoba Hydro obtained in Order-in-Council allowing the corporation to enter into agreements with Minnesota Power and Light. A National Energy Board Application was prepared but due to additional requirements of the National Energy Board for an extensive environmental study which was communicated to Manitoba Hydro in August of 1974 it was not possible to complete out application in conformance with their new regulations until August of 1975. Furthermore, the National Energy Board was not able to hold a public hearing until January of 1976. The certificate allowing us to build this international power line and the licenses for the operation of the new line together with the existing international line were received in March of this year - March '76.

The certificate of public convenience allowing Manitoba Hydro to construct the international power line basically approved the route we had selected in 1971 and 1972 and requires us to incorporate certain environmental requirements which we had agreed to at the public hearing. During this public hearing the Board requested Manitoba Hydro to review some possible alternative routings for the line north of the Trans-Canada highway. A report was quickly prepared and submitted to them which noted that the new transmission line routes had not been subject to any field study, or any review. A covering letter explained to the Energy Board that this report covered the factors which had led to our rejection of these alternative routes. Unfortunately, the National Energy Board

(MR. BATEMAN cont'd) saw fit to pick one of these alternative routes and Manitoba Hydro is now making an appeal to a higher court, because we do not believe the National Energy Board has jurisdiction in this matter. In addition to that the alternative route is much more costly. In assessing the 10 year period of the export licenses we had requested the Energy Board noted that we would be appearing before them with our 500 KV line proposition some time within the next year which would entail modification of these licenses. And also because the energy situation has been moving fast they have restricted the term of these licenses to six years. Now this six year term is quite satisfactory to Manitoba Hydro. In the matter of the export of surplus energy we have obtained the licenses that we requested. This will allow us to export up to a maximum capability of the two transmission lines in years when Manitoba Hydro has large surpluses due to high river flows. Manitoba Hydro has received a license to export firm power which is surplus to Canadian requirements under almost identical terms to the existing license. Manitoba Hydro also received a new type of license allowing us to exchange energy with American utilities on a seasonal or a shorter basis whereby Manitoba Hydro can make additional use of the hydro-electric reservoirs for upgrading value of energy and obtain additional revenue thereby. Manitoba Hydro did not obtain licenses requested under the terms of a package deal which had been made with the Minnesota Power and Light Company. Because we believe that the transactions which we had planned with the American utility can still be accommodated under the terms of the licenses which we have been issued. I am satisfied that we will be able to work out an agreement with the American utility enabling them to complete construction of the transmission line. We cannot now be sure that the transmission line will be ready to meet the planned in service date of November 1, 1976. Now the net financial loss next winter I hope will not be large.

In January of 1975 the Northern States Power Company informed Manitoba Hydro that due to rising costs and the difficulty of raising capital that they were not prepared to proceed with the two 500 KV interconnections as had been agreed to in a letter of intent that was signed in May of 1974. And I reported progress on this to you last year, Mr. Chairman. Now in August of '75 a new letter of intent was signed involving only one 500 KV line which is to be in service by May 1, 1980. An application will be submitted to the National Energy Board on this matter later this year. In May of 1975 a letter of agreement was signed with Ontario Hydro for sale of 50 megawatts to Ontario Hydro during the period from April 1, '77 to March 31, '78. The terms and pricing structure for this power are the same as what was previously agreed to for the sale to Ontario Hydro during the 1978 to 1982 period. It just adds a little additional load to the transmission line, instead of 150 it's now 200 in this period. There will be one formal agreement for all of these sales to Ontario Hydro and it is expected that this agreement will be signed very shortly.

Now in August, Nebraska Public Power District, which is the State immediately South of South Dakota, and Manitoba Hydro signed a memorandum of understanding to study a major interconnection to be established in the early 1980's. The basic incentive for an interconnection is the exchange of summer and winter diversity power. The target date for completion of an economic feasibility study of an interconnection between the two utilities was December, 1975. However, the study has not yet been completed. In view of the attention and also the criticism our future interconnections intentions to the U.S. had received in connection with our application for the 230 TV line a broader review of the subject of interconnections seems to be in order.

Now, Mr. Chairman, I'm going to show you a number of slides a little later to illustrate Manitoba's electrical system is really made up of a number of interconnections between the various sources of electrical generation that we have in this province. We then operate these stations to supply Manitoba's electricity demands at the lowest possible price. With interconnections outside of the province we buy and sell on these lines to again reduce our costs, or to get additional revenue from surplus power that we might have for sale. This additional revenue helps to reduce the cost of electricity to our Manitoba customers. Perhaps if we have the lights out I'll go over these slides.

This first slide as I mentioned is just showing the generating stations in the Province of Manitoba and the interconnecting transmission lines. We began this process of interconnecting our various sources of generation within the province about four or

(MR. BATEMAN cont'd) . . . five decades ago. At one time, of course, Brandon was supplied from a separate source, as was Minnedosa and several other smaller areas. The Pas was an isolated diesel system up until a few years ago. Thompson started out as an isolated supply from Kelsey and so on, and the Grid gradually grows as it's economic to make it grow. We extended the Grid very extensively during the farm electrification days and that was a very important milestone in the history of Manitoba indeed, to bring electric power to the rural areas.

This slide shows that we do have lines reaching out into Saskatchewan here and here and we are interconnected with Flin Flon and The Hudson Bay Company at that point. Our first interconnection into Ontario was here, which was a 138 line, and we have 2-230 KV lines at this point. And in 1970 we have the one line into the US, and the other one is now authorized which will go down off in this direction. Here's a slide which shows the . . . I'm going to make up the story of the interconnections on this slide. This is the scale of the megawatts of the Manitoba system. You'll see the other systems appear on here by these color codes, and you'll see the interconnection levels as they are at 115, 138, 230 and 500; they'll appear between the various interconnection systems. So here's the Manitoba system and that's how much reserve we had. I don't know whether you can see it, it's the cross hatched area, it's this little bit here at the top, it's colored blue but cross hatched. That's how much reserve Manitoba had back in 1955, we were about 600 megawatts installed, our load wasn't 500 megawatts.

Now in 1960 we had interconnected with, actually in 1956 we had interconnected with Ontario with 115 KV transmission line, actually we operated it at 115, and this is the capacity of that transmission line. This little block here which is less - well it's about 100 megawatts if you were stretching it. Now in 1960 we actually interconnected with Saskatchewan. You'll see that Saskatchewan, there's their reserve and there's their load, and here's the capacity of the first interconnection which we built for 230 and operated at 138. So that's the story of our first interconnection with adjacent utilities. You notice that the size of the capacity of the interconnection isn't large in relation to the size of the capacity of the system. In '67 we converted this line to 230 KV, and here we are, we have this much capacity, Saskatchewan didn't have as much reserve that year; and here's Manitoba's reserves, Ontario's reserves; reserves proportional to the size of the system but the interconnections are getting more and more insignificant relative to the size of the systems.

Now in 1970 we still have the one into Ontario, small one, and we have the same line into Saskatchewan, but, we built a 230 KV line into the United States with a capacity about 200 - well it's not quite 200 megawatts, 180, but we are connecting now a Manitoba system of this much, which is about 1700 megawatts or thereabouts, with a system which has, way off the scale, 14000 megawatts. You can see how the spinning reserve in that system can come to our rescue over this much capability of this line, anytime we get into trouble, and believe me this has been a great help on a number of occasions. So we're connecting with a large system, but basically we're connecting with the entire U.S. market area or generation area, all way from New York to Florida and so on. But this is only represented by the pool South of us which 14,000 megawatts compared to, I think it's a couple a hundred thousand megawatts of installed capacity.

Now in 1972 we increased our capacity into Saskatchewan by a second line and we have a little more, our system is growing a bit more, and we also build these 2-230 KV lines into Ontario, which you can see we now are able to supply a fairly significant part of the Northwest Ontario systems capacity, which we are doing. We have a firm contract with Ontario selling power to them. And we have this line still in place. Next planned for this year, we interconnected with another utility, Hudson Bay Mining and Smelting, '74 I think it was, we had that interconnection going and we now are able to sell and purchase, we're purchasing all Hudson Bay surplus energy. And this is the second U.S. tie planned which is this much capacity relative to the total which . . . this is 4,000, and 14,000 is a way off the scale. So this is how interconnections develop; we anticipate another one with Saskatchewan in the next few years and so on.

Now how have we used these interconnections? I'm showing you a slide that dates back to 1960 with the total Manitoba generation shown in green which is, in energy here, thousands of gigawatt hours, or billions of kilowatt hours, our total system was

(MR. BATEMAN cont'd) just 3 billion kilowatt hours in 1960, 1958 actually. In 1960-61 we actually bought - below the line you see is import and above the line is export - we were buying in those years, we sold and bought in this year, and this year it was all sales, this year, '68, it was purchase and sales, and in 1970, actually '69 and '70 we purchased a fairly significant amount before Kettle Rapids came on the system. Now Kettle Rapids was a very large plant relative to the size of the Manitoba system, and it produced a lot of surplus Hydro available for us to sell to our export market. And you can see we have been selling it, as we installed more machines we sold more surplus energy until this last year we sold just a little short of 3 1/2 billion kilowatt hours. The year that's just ended we sold just about 3 billion kilowatt hours less. As we need more, you see we sell less, That was the story when the capacities were small, it's the story again as the capacities have increased. And this of course, when the U.S. tie came in, this black line here is the capacity and sale over the U.S. line. You will notice that we are selling more to Ontario than we are to the United States, and the Manitoba load now of course is up, in kilowatt hours - this is energy on this scale it's not capacity of the interconnection, this represents the amount of energy not the capacity of the interconnections - is well up off the scale here, I think our report shows around 13 billion kilowatt hours that year. And this of course, is the total import or export over the line netted out.

Well I think that tells somewhat of a story and I have another - I think one important item lately is that while Saskatchewan doesn't look like they've been taking much lately, we have been exporting larger quantities of surplus energy to Saskatchewan where it is being used to displace electric plant that's burning natural gas which I think is a very important thing to conserve.

MR. CRAIK: Could I interrupt you at this point, Mr. Chairman, just to ask Mr. Bateman about the previous line?

MR. CHAIRMAN: Mr. Craik.

MR. CRAIK: Just in case we can't get back to it. The blocks at the end of your interconnection lines really indicate the capacity you can get out of your neighbouring systems.

MR. BATEMAN: That's the capacity that we could get over these two interconnections from our neighbouring systems.

MR. CRAIK: Yes. Right. Now if you had a real outage from the north, if you lost the two main lines in, if you add up all those blocks, they don't represent at this point any more than a minority of the requirements.

MR. BATEMAN: You're absolutely right, Mr. Craik, and that's why we are planning the 500 KV interconnection, that's the point I'm trying to come to. For other reasons as well as providing more capacity, it has a . . . we'll show you that as we move down into the next . . .

Now Manitoba Hydro total revenue and the export revenue, you'll see that we have been making some significant numbers of dollars from our export revenues in the total revenue requirements of the utility.

One other major factor that affects these interconnections and the fact that we have been able to export energy in this last few years in such large quantities is because we've had better than median flows. This graph shows you the surplus hydro-electric energy as a percent of the Manitoba demand, under a wet year, you can see what we've been experiencing, in 1976 we can export about 12 percent, which is what we did, and as we install our Long Spruce plant and if the wet cycle continues, we'll be able to export more. On the other hand, if we get median flows, then as our load grows, as we don't add any new generations, over this period except the Long Spruce plant, the available energy for export will decrease until we get down here to 1983 when we add our next Hydro plant, Limestone, and then we will increase our ability to export more energy and likewise out as we add new generations. Now if it is dry, if it is a low-flow period, then here is what we can support. Zero. As a matter of fact we will be in a net-import position. It's only because we have better than the minimum flow conditions that we're experiencing that we can export the surplus.

Now one of the interesting phenomena of this, I've taken a 1981 period here, January to January of 1981, and this is our projected load curve for that year. There's

(MR. BATEMAN cont'd) the Manitoba demand. Now you'll notice that we peaked December, January, February and start trailing off here, we have our low load period in the summer, and we need this much capacity just to meet our load. We need that much capacity, and you'll see that that load is just over 3,500 megawatts by 1981. And we have, of course, to put reserve on top of this for operation reasons and the contingencies that occur in losing equipment and so on.

Now Northern States Power Company which is this black curve, you'll see that in 1980-81, they peak in the summer time, you see, and they have to have that much installed capacity, the blue line, and you'll see that they are almost twice our size, they're about 6,800 megawatts in their summer peak of '81 compared to our 3,500 megawatts of January '81. Now if we add that curve, if we take all of these ordinants, each one, that point and that point and add them together, we get that point. We take this point and this point and add them together, we get that point. So here's the curve, here's the shape of the combined curve. You notice it has more peaks in it now because it has a summer peak and a winter peak, a summer peak and a winter peak. And this is the installed capacity that we require to supply the combined systems. Now you'll notice that if you add this blue and this blue, you would get this top curve here. That is if you add that point and that point, you would get that point. And, therefore, this red solid area represents the total potential reduction in the required installed capacity on these two systems. When we start talking about \$1,000 a kilowatt, each hundred megawatts is quite a substantial number of millions of dollars of capital saving on the Manitoba system. Now by having this interconnection we can consequently share these reserves with Northern States Power, export ours in the summer to them and they export theirs in the winter to us, and we both save some capacity. So it's a very desirable situation to be able to work that with the Utility to the south of us that has a diverse relationship to ours.

Now over the years we get revenue from these exports and I've tried to show here what our costs are with export, this is what our average cost last year was, a little over 6 1/2 - 7 mills. Now if we had not had the export, our costs would have been 2.1 mills higher for each kilowatt hour that we generate. In other words, we would have been required to raise additional revenue from our own customers to meet our costs to that extent. Now we can turn the lights on for a bit. I've dealt at some length with interconnections, Mr. Chairman, but I think it's a very important subject from our utilities point of view. And I'm just going to briefly cover some of the comments about the other transmission and distribution facilities in the province.

We have approximately 300 miles of new 66 KV transmission planned for the ten year period up to and including 1986. In May of 1974, we approved, as a corporate utility, we approved 25 TV for distribution voltage for the Manitoba Hydro system. Now subsequently, voltage conversions from the 8 to 25 KV in rural areas will be made instead of to any other voltage and we'll be converting four KV to the 25 KV in suburban Winnipeg. In fact we've already initiated some of that.

Now these conversions, of course, are only required when it becomes impossible to provide an acceptable utilization voltage level to customers due to increased loading on the existing facilities; and forward planning studies for the ten years in the rural areas and 20 years in suburban Winnipeg area are continuing to insure that the facilities proposed on a short-range basis will complement future system additions required to provide for long-range load projections. We anticipate that in the course of time our electrical system will have to provide the majority of energy requirements in this part of the world.

Now a word about isolated systems. I did mention to you that they did grow last year a bit. In view of the high and increasing costs of diesel fuel, the provision of electric power to isolated communities has received much study from us during this past year. We have a policy of applying the same rates with some service restrictions in the isolated diesel generation areas and the results of our continuation of supply to these isolated communities at the same rates as in the towns and villages that we supply in rural Manitoba, has resulted in a fairly significant financial loss in the operation of the supply for these communities. These losses increased, for example, from 215,000 in 1972-73 to an estimated 1.8 million dollars in 1975-76. The cost per dollar of

(MR. BATEMAN cont'd) revenue increased from 1.13 dollars to 1.86 dollars in the corresponding period. We can't continue to lose money in the supply of these diesel communities much longer.

Detailed studies have been made of the transmission of central station power to seven isolated communities and I'll name them: Moose Lake, Dauphin Lake, Jackhead, Pukatawagan, Pikwitonei, Thicket Portage and Bloodvein. Last year our revenue from these communities was \$190,000 and our deficit was \$119,000. Now if we were to replace all these diesels by transmissions from central station, all it would do would increase our deficit more than tenfold. The cost of supplying these small loads by central station power is very significant. However, we are looking at the possibility of building lines to some of these communities with some aid from the government.

Central station supply to Churchill was studied thoroughly in the fall of 1973 and it was concluded that the project should be deferred indefinitely with review of the situation at two year intervals. The diesel fuel costs at Churchill have risen from 16.1 cents a gallon in 1973 to 36.2 cents a gallon, so the situation is being watched carefully.

Now for the other isolated communities, the oil prices for 1976 range all the way from 60 cents a gallon at Island Lake to over 86 cents a gallon at Shamattawa. Now you can see that it's not very sensible to burn a gallon of diesel fuel in a diesel generator to produce electricity to warm anybody when you can burn the same fuel oil and get the potential BTU's out of it. In view of the very high costs of providing electric energy supply to these small remote communities we started exploring other alternatives to using costly diesel fuel oil which has to be transported over these long distances at the high costs. One possibility seems to be producing gas from scrap wood. At some locations it might be feasible to install very small water turbine sets and we will continue to investigate all of these possibilities. Although Manitoba Hydro itself does not have a research department, during the past year we have continued to contribute funds for research in areas of concern to Manitoba Hydro at various universities in Manitoba and we also continue to subscribe to the Canadian Electrical Association Research Fund. This program is now in its second year supported by over 98 percent of the Canadian utilities and financed to the extent of \$1 million from utilities in 1976 and the Federal Government sponsored it to the tune of \$550,000. We hope that the Federal Government contribution will improve.

The 1976 approved program will give priority to energy conservation and the efficient use of electric power but will also include work in transportation, distribution and generation, and projects range from more attractive transmission lines to improvement of the domestic heat pump to make it more suitable for the Canadian winter climate. Now as our demand for electricity continues, and the need to minimize associated environmental impacts, as we get into this area where we're concerned that Manitoba Hydro clearly recognizes as being of . . . we are concerned about the impact that our developments have on the citizens of Manitoba and the evolving science sometimes limited or sometimes called an art, that is the environmental assessment relative to electrical energy developments, is continually being reviewed within the corporation to ensure that adequate environmental studies are prepared for related corporate activities.

Over the past fiscal year, considerable effort has been placed on environmental projects, some of which were of a continuing nature and others representing new direction for the company. In particular, the findings and recommendations of the Federal-Provincial Lake Winnipeg, Churchill and Nelson River Study Board Report have been reviewed and have been evaluated and appropriate direction has been given to construction personnel to ensure that fuel activities are modified to accommodate the Study Board recommendations. In a similar manner, the Provincial Department of Mines, Resources and Environmental Management has issued its environmental study of developments along the lower Nelson River.

With respect to the operation of our thermal generation facilities at Brandon and Selkirk, Manitoba Hydro is continuing to work closely with the environmental staff of the Clean Environment Commission to ensure full compliance with all relevant provincial environmental statutes. Manitoba Hydro in its ongoing program of evaluation of future alternative generation sources, such as the nuclear plants I spoke of required to meet our anticipated provincial load, has initiated a site investigation program to seek

(MR. BATEMAN cont'd) out the environmentally compatible sites which may be required for development by the late 1980s. Environmental studies developed throughout this siting program will represent comprehensive and in-depth assessments of a wide spectrum of environmental components. In keeping with Manitoba Hydro's tradition of maintaining a close-working relationship with provincial authorities, the siting will proceed in close co-ordination with appropriate environmental bodies in the province.

The need for environmental studies has been extended to include that of extra high voltage transmission line developments, in particular, a detailed and sophisticated environmental assessment was prepared for the recent National Energy Board hearing held in January of this year. Guidelines evolving from this study will form the framework for establishing acceptable environmental studies of future EHV transmission lines in the province. In general, Manitoba Hydro is committed to a course of action which will ensure the environmental studies become an integral part of the overall planning process developing within the corporation. Moreover, it is the express goal within Manitoba Hydro to seek out a reasonable balance between the magnitude and costs of requisite environmental programs and the identifiable stream of benefits which will be derived from such endeavours.

Now perhaps the subject that some of you have been waiting for me to comment on, the rate increases. The rate increase that is being implemented this month has received some publicity. I'd like to show you the basis on which the increase was made. I have another table which presents a condensed statement of our operations as projected for the years ending March 31st, 1976 and 1977. Manitoba Hydro customer revenue is shown as it would be if the 1975-76 rates had applied in both years. We have an agreement with Winnipeg Hydro in which Manitoba Hydro supplies the additional generation facilities required by Winnipeg Hydro, and that additional generation is based on the cost sharing of the additional generation and major transmission. Winnipeg Hydro also share the revenue from any extraprovincial sales that Manitoba Hydro makes. The revenue from Winnipeg Hydro in line with the agreement automatically increases as our costs increase, and in fact, the percentage increase after allowing for growth in consumption can be seen to be very closely in line with the level of the increase of our expenses. The major expense increases relating to interest and depreciation are largely uncontrollable. In the current year that I'm going to talk about and show you on the curve, they're related to the placing in service of plant which was committed in previous years, and to the increased average interest rate on the system. There is also a significant increase in operating wages and salaries which is mostly the result of these inflationary times. The excess of revenue of 6.2 million dollars and the transfer to rate stabilization reserve of half a million dollars is shown in accordance with our latest revised financial plan. The actual figures will not be known for another month approximately but so far our present indications are that the actual will be slightly better than the estimate as a result of better than anticipated revenue from Manitoba Hydro customers and smaller increases in wage and salary costs due to holding the line on staff increases. To the extent that an improvement is actually experienced the rate increase otherwise required in the 1977-78 fiscal year could of course be reduced, as can be seen by this sheet if I can get it on. Now there's the picture. In '76 we anticipate being able to transfer half a million dollars to rate stabilization reserve. I have some confidence that this will be slightly better than that. But if we had kept those same rates that produced this picture with the load estimate that we have for next year, we would have produced this picture. You see that our balance . . . we would have had to draw 23.9 from the rate stabilization reserve, which I'll show you we haven't got. You see in your figures you haven't got. That 23.9 million dollars is about 19.8 percent in additional revenue. Now we didn't give everybody a 19.8 percent rate increase, we spread it into the areas where we're trying to get the rates into some relation to the cost of service. In the statement of operations, when we addressed our total requirements for new revenue we included an amount of 6.9 million for contingency and general reserve. The amount of this requirement is by statute a responsibility of the Board of Manitoba Hydro, and the reserve allowed for is calculated in accordance with the policy that's approved by the Board. If there is any concern about the level as stated the next chart clearly shows that it is modest in relation to that recommended for Manitoba Hydro by the Public Utilities Board in 1970.

(MR. BATEMAN cont'd)

Now go back to, in 1970 we had a very thorough review of our picture by the Public Utility Board and this table illustrates the percentage increase in revenue that would be required if Manitoba Hydro were to earn the interest coverage which was recommended by the Public Utility Board in 1970, and if I could quote very shortly from their report, Mr. Chairman, the Utilities Board said, "It is the view of the Board that Manitoba Hydro must aim for the sake of its future financing at an interest coverage which will be sufficient to elicit investor confidence in the bond market. This can be achieved only by an improvement in the net revenue position, which is to say total revenue less operating and depreciation expenses." The board went on to say, "The board therefore determines that the prices Manitoba Hydro should charge for power in the various rate classifications should be such as to return to it during its four fiscal years terminating on March 31, 1974 an increase of \$45 million over the presently anticipated revenues for that period, of 309.1 million with the objective of achieving a net interest coverage of approximately 1.25 times. The Board estimates this increase to be one of approximately an additional 14 1/2 percent in 1960-1970. Now you see 6.9 is what the Board of Manitoba Hydro has established as a contingency reserve on the formula we have. The level that was recommended by the Public Utilities Board in 1970 would see us putting 20.9 million dollars away, or instead of a 19.8 percent increase in rates we would have had to go to a 31.4 percent increase in rates. Now this is a significant thing, some people have said the Public Utility Board or the Anti-Inflation Board wouldn't let you away with a rate increase but here we're just passing on these costs and we're not meeting the requirements that we were informed of by the Public Utilities Board back in 1970.

Now if we were to put an interest coverage in that would be equivalent to what Quebec Hydro has, we would have had to put 71.8 million dollars away or a revenue increase of 73.6 percent. Ontario Hydro is 52.9 percent. To match their present levels this is what we would be required to do. Saskatchewan Power 45.3 percent or B.C. Hydro 23.1 percent. Now so far we feel that we are maintaining an adequate reserve position, we are not affecting the rate at which we have to borrow money and so on and using the calculation that was proposed by the Public Utilities Board of taking that 20.9 million rather than the 6.9 that the Board has authorized would of course have meant a substantial increase in revenue, of the 31 1/2 percent rate instead of the 19.8 percent.

Now what about the future. How are we going to manage to provide the reserves and the operating expenses and so on to meet all this new plant that's going in. Well here's the picture. The final table illustrates our projected operating results for the next five years and the resultant increases required in rate levels. It is our expectation that following another increase in the 20 percent range next year we can look forward to a period of lower rate increases, although a large part of the costs in these years are unalterable at this time because they relate to the installation of capital plant which is already under construction and as required to meet the projected low requirements in those years. Achieving the results indicated is dependent on the success of the Federal Government in reducing the level of inflation and in holding interest rates at the current level.

One further significant factor that could alter these projections is the level of river flows which I spoke to you about earlier. Now the projections that you're looking at are based on median river flows and the effect of the variations between high and low flows and I indicated is significant, could mean another 30 million dollars in revenue in any one of these years. Now assuming that we experience these economic and climatic conditions, that is that we are able to hold the inflation level to what the Anti-Inflation Board thinks, and that we can hold the interest rates at approximately what they are now, then you can see that after another increase next year as I say in the order of 20 percent or to the extent that we are better off here in achieving our half million dollars, if we actually achieve 1 1/2 million there this will mean less revenue requirements here, because we could take that out of the rate stabilization reserve. But we get down here in '81 to less than 5 percent additional revenue requirements. And the future looks better until we get the next major Hydro site on the system, when again we're going to have to pay for it. So if these flow conditions were to change in any one of these years you

(MR. BATEMAN cont'd) could see that our expense would go up significantly from what I've shown here and the additional revenue requirements would likewise increase.

Now it's likely that variations from these conditions in any year will cause our results to be more or less favourable than projected, and the low individual annual increases can be adjusted accordingly, it's unlikely that there will be any significant change in the level to which rates must increase by 1981. Although I must say, Mr. Chairman, that if we continue to have very adequate flow years, we will generate additional extra-provincial sales to what we've shown here, these are based on median flows and this may be a very significant plus factor.

Mr. Chairman, that concludes the remarks I intended to make. Have the lights now.

MR. CHAIRMAN: Thank you Mr. Bateman. Are there any questions? Mr. Craik.

MR. CRAIK: Mr. Chairman, just in the time remaining here maybe I can ask Mr. Bateman just a few questions coming from his presentation. In the last table that you've indicated here, do you have copies of that that we could have?

MR. BATEMAN: No, I haven't got copies.

MR. CRAIK: Could we get copies of your . . .

MR. BATEMAN: It will be in the record, but we could have copies made available.

MR. CRAIK: The figures won't show in the record, Mr. Chairman.

MR. BATEMAN: Yes. That's right.

MR. CRAIK: What rate of inflation are you assuming in those tables?

MR. BATEMAN: Within the Anti-Inflation Board Guidelines.

MR. CRAIK: Ten percent continuing through until 1981?

MR. BATEMAN: Well I will qualify that with the information we give you. We'll give you the assumptions they're made on.

MR. CRAIK: With the table that you're going to present. Some other questions regarding your presentation. In your presentation regarding the interconnection with the U.S., your graphs and so on dealt pretty extensively with the NSP connection as opposed to you . . . and don't show your connection with Minneapolis Power and Light, which . . .

MR. BATEMAN: That was in the second slide that showed the 1976 connection. That includes the one to MP & L the 230 KV line. I didn't show you a slide with a 500 KV line on it.

MR. CRAIK: In regards to the MP & L interconnection you indicate here that the overriding considerations of your dispute with the National Energy Board is the location of the line for environmental reasons North of the Trans-Canada Highway. Is there not also as indicated concern on the National Energy Board's part of the price of the export of the interruptable power.

MR. BATEMAN: Yes, they didn't grant the . . . their concern was about a very small part of the export license that we had asked for. In other words, they did not give us the license for the export of firm power as a package deal with a certain amount of it at one price and part of it at 3 mills, which was a very small part of the total. They did not give us that, but they did give us all the energy we wanted and they did give us the opportunity to make the two year capacity sale by putting together four of these six month periods together.

MR. CRAIK: Are you renegotiating the price of the interruptable power with the MP & L?

MR. BATEMAN: Well we're renegotiating the contract with MP & L, yes.

MR. CRAIK: Then essentially the National Energy Board is not inclined to allow you that sale, in part due to your subsidizing of the portion of the line that's in the United States, is that . . .

MR. BATEMAN: That was basically what their statement was, yes.

MR. CRAIK: Is that part being appealed as well?

MR. BATEMAN: No, no we're not appealing that.

MR. CRAIK: So that part is now under renegotiation with MP & L?

MR. BATEMAN: We are just renegotiating with MP & L on the new contract.

MR. CRAIK: Is there a possibility that that particular interconnection will not go ahead?

MR. BATEMAN: No, I think that interconnection will go ahead, it likely will not be in service by November 1 of this year as we had contemplated, but it will be in service some time - about a year hence.

MR. CRAIK: That means that MP & L then will pick up, or the other utility in that area, whatever the name is, will pick up the cost of the portion of the line in the United States then?

MR. BATEMAN: They were picking up a portion of the cost of the line in the United States in any event.

MR. CRAIK: What was the purpose of the reduction in the interruptable price for that part of the line? Is it financing or what?

MR. BATEMAN: Well it was a bit of an incentive at the time we negotiated, we tried to get this transmission line to improve our ability to increase our system reliability several years ago and we didn't succeed. Now we had to put together a package that had some incentive to the American utility and the incentive was chosen to be part of the energy, a small part of the energy, at 3 mills. Which coupled with what they were paying for capacity and the interruptable would have made it more attractive to them. They in good faith went ahead on that basis. Now the Energy Board has told them that we can't do that and I'm somewhat concerned about what the Federal Power Commission may react to the energy boards ruling, however, we're re-negotiating our position first with the MP & L, then they will present that to the Federal Power Commission. We of course have been given licenses for the export of all of the surplus energy that we ask for and also capacity by 6-month periods which can be stacked together.

MR. CRAIK: You've got the license for the export of the block of power but not necessarily at the price that you had intended initially to sell it for. Isn't that it?

MR. BATEMAN: Basically that's correct but by and large everything is the same except that small block of the energy that was going to be sold at 3 mills, which now cannot be sold at 3 mills.

MR. CRAIK: What price then will it be sold at?

MR. BATEMAN: It will be sold as economy energy.

MR. CRAIK: 5 1/2 mills?

MR. BATEMAN: No, no, no, no it will depend, economy energy is sold on the basis of what it costs to produce it, and what it costs to . . .

MR. CRAIK: The cost of your subsidization of the American portion of the line amounted to, when you equated it back, to around 2 mills did it not?

MR. BATEMAN: I'm not sure that I understand your question. You say our subsidy equated at 2 mills? No, our subsidy was a fixed block of energy at a reduced price.

MR. CRAIK: At a reduced price, but the equivalent on the fixed block of power, the difference between what you were selling it for and your participation in their part of the line amounted to about 2 mills on that block sale did it not?

MR. BATEMAN: Well that was our estimate but I think Mr. Craik, all of this testimony has been given under oath to the National Energy Board. I mean I would rather re-read it to, you know, put it right in it's . . . or get somebody who was a witness on the Energy Board to give you the answer to that question.

MR. CRAIK: Well on the part that is firm, the sale to the United States, what will be the approximate price of the firm portion?

MR. BATEMAN: What will be the approximate price of the firm portion? Well again I'd like to refer to the licenses and give you the . . . I don't remember all of these prices myself but I can easily get them for you.

MR. CHAIRMAN: Possibly it might be a good idea at this time to stop, it is 12:30. The next meeting of the Report of the Manitoba Hydro is scheduled for Tuesday, April 13, that's one week from today. Committee rise.