Q. On page 9 of Mr. Greneman's Evidence, it is stated that the level of diversity at each voltage level was recognized. Please provide the methodology used to incorporate diversity into the demand allocation factors.

A. Please see Attachment A. It should be noted that the May 2003 demand allocation factors used slightly different diversity factors, as the allocation factors were developed prior to the finalization of this document. The final Cost of Service filing will reflect the attached values.

Newfoundland and Labrador Hydro

DEMAND DIVERSITY IN DIESEL FORECASTS

Stone & Webster Management Consultants, Inc.

I. BACKGROUND

In developing coincident peak demands for use in Hydro's cost of service study, the winter peak for each diesel region was assumed to be the winter peak. However, upon examining the monthly data, Stone & Webster Management Consultants, Inc. (SWMCI) believes that the forecast of coincident peaks (CP) contained in the tables for the diesel remote areas do not reflect the proper diversity of demands, as in many cases diesel regions actually peaked in non-winter months.

II. MONTHLY PEAK DEMANDS

SWMCI reviewed monthly peak demands for the diesel regions for the year 2001 from data provided by NLH. A comparison of actual annual peak demands by month to the winter peak months showed that several regions actually did not peak in Hydro's peak months of January and December. Examples of these diesel regions include Black Tickle, Cartwright, Makkovik, Rigolet, Charlottetown, Mary's Harbour and St. Lewis in Labrador and also Grey River, Little Bay Islands and Ramea in the Island (See Attachments #1 & #2).

With the 2001 peak data as a guide, comparison of the magnitudes of those actual demands was made to the 2004 forecast of annual CP demands. That review strongly indicated that again many of the forecasted peaks do not reflect monthly peak loads in January or December (See attachment #3).

Based that analysis, SWMCI also reviewed the actual peaks in 2000 and 2002 for the remote diesel areas and found similar results. Subsequently, diversity factors were developed from the 2000, 2001 and 2002 data that compared the annual monthly peaks to the combined peak in January for all diesel regions. This yearly analysis resulted in diversity factors as shown below for three different subset regions studied.

NLH DIESELS	DIVERSITY FACTORS			
	2000	2001	2002	AVERAGE
LABRADOR REGION	85.5%	81.6%	87.7%	84.9%
NORTHERN REGION	83.4%	83.9%	79.5%	82.2%
LABRADOR AVERAGE				83.6%
ISLAND REGION	88.2%	75.7%	90.3%	84.7%

III. DAILY PEAK DEMANDS

SWMCI also reviewed fifteen-minute and hourly load profiles of the remote diesel regions for which 1997 interval data was made available by NLH. We do not believe the consumption pattern of customers in the diesel regions has changed considerably since 1997. For the purposes of this test analysis, data from days in April 1997 were most commonly available (See Attachment #4). April, being a lower load month, would have a higher diversity factor than a peak month. Therefore, our estimate of diversity will tend to be on the conservative side.

Two separate tests were made to determine, if within the same day there is a diversity of demand for the exact hour of each region's peak. Using both the fifteen-minute and hourly loads, a comparison of coincident demands at 6:00 PM (NLH's peak hour) to the region's daily maximum peaks was conducted. The resultant diversity factors for the hourly data and the fifteen-minute data are shown below.

REGIONS	DEISEL	DATA INTERVAL	DIVERSITY FACTORS
LABRADOR	Cartwright, Nain, Hopedale, Makkovik, Rigolet	Fifteen-minute	89.3%
ISLAND	Francois, Little Bay Islands, Ramea	Hourly	81.2 %

IV. RECOMMENDATION

SWMCI believes that this evidence confirms our conjecture that the forecasted remote peaks do not reflect the proper diversity of demands for the diesel regions. It is suggested that a combined diversity factor be applied to the forecasted demands to account for both monthly and hourly diversities.

The two types of diversity factors developed for Labrador and Island are multiplicative and would be applied as a single diversity factor to the forecasted diesel demands in each region. A diversity factor of 74.7% is recommended for the combined diesel regions in Labrador and a diversity factor of 68.2% for the diesel regions on the Island.

Attachment #1

RURAL OPERATIONS
ISOLATED PRODUCTION SUMMARY

LABRADOR
REGION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max
NAIN	1,142	***1,313***	997	946	1,160	994	987	893	955	1,307	1,205	1,143	***1,313***
MAKKOVIK	561	476	461	452	419	481	629	628	***666***	591	494	560	***666***
CARTWRIGHT	712	908	646	664	662	821	***974***	894	970	851	875	751	***974***
HOPEDALE	580	***665***	494	527	492	488	440	415	447	507	557	651	***665***
DAVIS INLET	615	***626***	516	494	423	489	375	322	388	525	552	601	***626***
RIGOLET	398	388	344	344	340	316	333	429	***537***	471	402	526	***537***
BLACK TICKLE	258	246	233	221	248	343	***500***	433	465	311	254	279	***500***
POSTVILLE	277	***300***	276	270	251	259	248	264	249	255	265	281	***300***
PARADISE RIVER	51	46	41	47	36	39	39	40	40	36	42	32	51
REGION TOTAL	4,594	***4,968***	4,008	3,965	4,031	4,230	4,525	4,318	4,717	4,854	4,646	4,824	***4,968***

NORTHERN
REGION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max
L'ANSE AU LOUP													
HYDRO QUEBEC	3,299	2,939	2,615	2,059	2,485	2,560	3,076	2,522	2,280	2,527	2,854	3,225	3,299
CHARLOTTETOWN	544	560	560	502	936	1,233	1,301	***1,313***	1,289	1,163	1,163	525	***1,313***
MARY'S HR. DIESEL	684	720	648	684	684	840	876	816	888	***912***	864	804	***912***
MARY'S HR MINI-HYDRO													0
ST. LEWIS	408	368	369	352	344	447	***488***	474	480	378	392	394	***488***
PORT HOPE SIMPSON	600	600	528	528	528	456	420	468	468	492	600	612	612
WILLIAM'S HARBOUR	97	75	70	71	71	73	67	60	67	85	83	78	97
NORMAN BAY	46	***49***	48	48	41	42	36	34	36	44	38	42	***49***
REGION TOTAL	5,678	5,311	4,838	4,244	5,089	5,651	***6,264***	5,687	5,508	5,601	5,994	5,680	***6,264***
TOTAL LABRADOR	10,272	10,279	8,846	8,209	9,120	9,881	***10,789***	10,005	10,225	10,455	10,640	10,504	***10,789***

Bold italic indicates peaks in months other than January and December

Attachment #2

RURAL OPERATIONS
ISOLATED PRODUCTION SUMMARY

CENTRAL REGION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max
RAMEA	1,163	***1,337***	***1,337***	1,158	1,158	1,158	1,158	796	780	818	957	1,131	***1,337***
LITTLE BAY ISLANDS	294	254	271	430	529	619	***785***	***785***	453	497	414	404	***785***
ST. BRENDAN'S	334	407	273	407	407	298	294	256	252	270	316	410	410
RENCONTRE EAST	278	***352***	339	339	339	339	339	184	190	214	252	285	***352***
HARBOUR DEEP	235	217	217	224	209	224	224	209	172	224	236	260	260
FRANCOIS	256	229	200	229	229	229	229	172	173	198	217	270	270
GREY RIVER	201	217	***264***	196	196	196	196	175	160	188	220	220	***264***
McCALLUM	197	201	***238***	***238***	0	0	0	0	0	0	0	217	***238***
PETITES	50	48	38	44	44	35	38	43	48	48	51	56	56
REGION TOTAL	3,008	3,262	3,177	***3,265***	3,111	3,098	3,263	2,620	2,228	2,457	2,663	3,253	***3,265***
TOTAL ISOLATED	13,280	13,541	12,023	11,474	12,231	12,979	***14,052***	12,625	12,453	12,912	13,303	13,757	***14,052***

Bold italic indicates peaks in months other than January and December

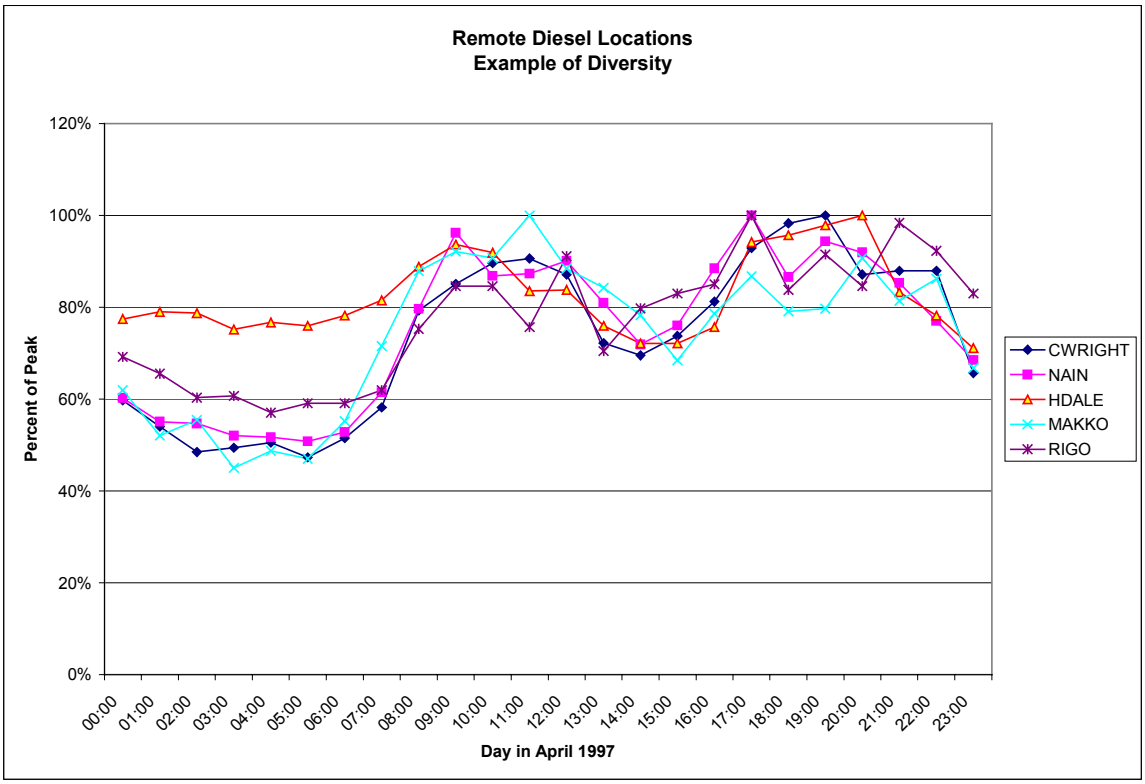
Attachment #3

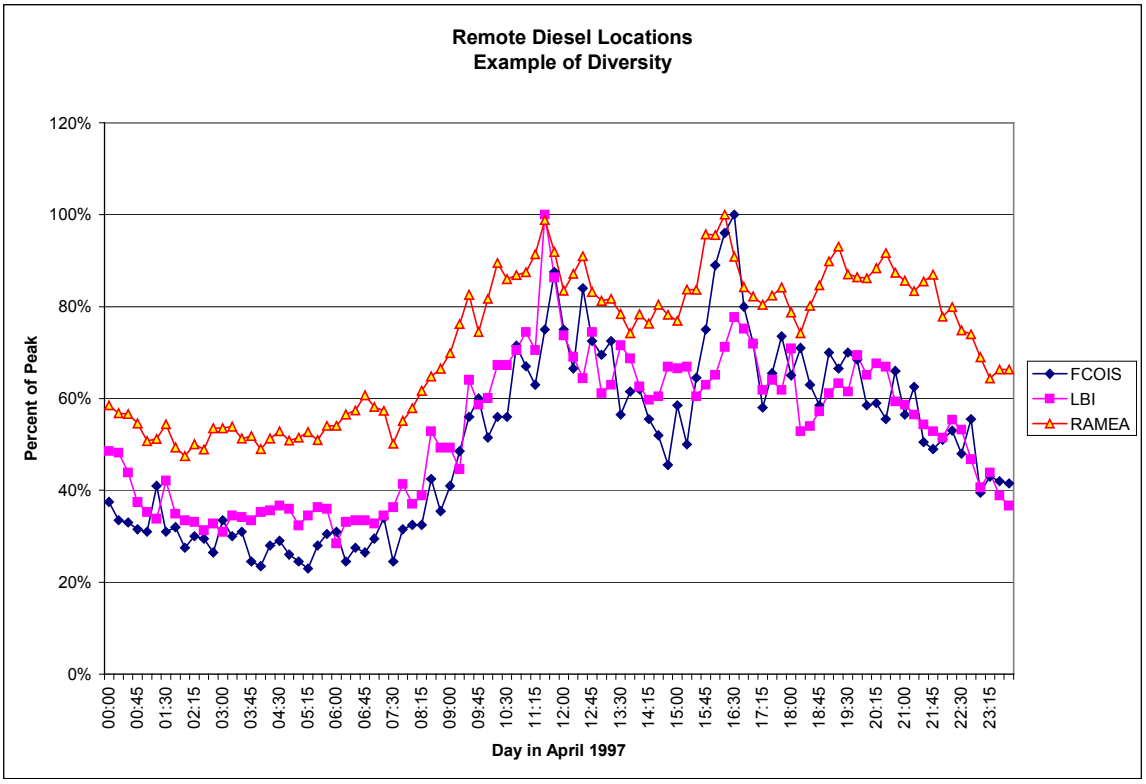
COMPARISON OF CP'S IN NLH DIESEL REGIONS

2001 ACTUAL			2004 FORECAST	
LABRADOR	KW		LABRADOR	KW
Black Tickle	***500***		***Black Tickle***	***483***
Cartwright	***974***		***Cartwright***	***962***
Davis Inlet	626		Davis Inlet	1,308
Hopedale	665		Hopedale	757
Makkovik	***666***		***Makkovik***	***752***
Nain	1,307		Nain	1,542
Paradise River	51		Paradise River	40
Postville	300		Postville	360
Rigolet	***537***		***Rigolet***	***526***
NORTHERN			NORTHERN	
Charlottetown	***1,313***		***Charlottetown***	***1,361***
L'Anse au Loup	3,182		L'Anse au Loup	3,807
Mary's Harbour	***912***		***Mary's Harbour***	***959***
Norman Bay	49		Norman Bay	56
Port Hope Simpson	612		Port Hope Simpson	719
St. Lewis	***488***		***St. Lewis***	***524***
Williams Harbour	97		Williams Harbour	87
CENTRAL			CENTRAL	
Francois	270		Francois	275
Grey River	***264***		***Grey River***	***226***
Harbour Deep	260		Harbour Deep	
Little Bay Islands	***785***		***Little Bay Islands***	***780***
McCallum	238		McCallum	245
Petites	56		Petites	53
Ramea	***1,337***		***Ramea***	***1,289***
Rencontre East	352		Rencontre East	308
St. Brendan's	410		St. Brendan's	404

Bold italic indicates peaks in months other than January and December

Attachment #4




Remote Diesel Locations
Example of Diversity
Percent of Peak
120%
100%
80%
60%
40%
20%
0%
00:00
00:45
01:30
02:15
03:00
03:45
04:30
05:15
06:00
06:45
07:30
08:15
09:00
09:45
10:30
11:15
12:00
12:45
13:30
14:15
15:00
15:45
16:30
17:15
18:00
18:45
19:30
20:15
21:00
21:45
22:30
23:15
Day in April 1997
FCOIS
LBI
RAMEA