

1 Q. In reply to NP-NLH-154, Hydro states that the impact of using the median (i.e. 4,590
2 GWh) of hydraulic probability distribution instead of the mean (i.e. 4,533 GWh)
3 (and assuming that the 2013 Test Year No. 6 fuel consumption price is used in each
4 scenario) would be to reduce the revenue requirement by \$9,261,000. In Hydro's
5 assessment would the use of the median of the hydraulic probability distribution be
6 a reasonable approach or equally as reasonable as using the mean approach? If
7 not, please explain. If so, please explain.

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10 A. Hydro's response to NP-NLH-075 states that the mean, median and mode of the
11 distribution of hydraulic production are as follows:

12	mean	4,533 GWh
13	median	4,590 GWh
14	mode	4,690 (when data are rounded to nearest 5 GWh)

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16 The response also provides an estimate of the Holyrood fuel cost implications of
17 using the median value of expected generation instead of the mean.

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19 The approach used in this and previous GRA analyses have been to use the mean to
20 estimate expected future hydraulic generation values. Hydro agrees that using the
21 median of the hydraulic probability distribution as an indication of future
22 generation could be a possible alternate approach. The mean, median and mode
23 are all measures of central tendency of a distribution and when the three measures
24 are close, it suggests that the distribution is symmetrical and normally distributed.
25 The mean is generally the preferred measure because it uses the values of all the
26 observations in the data sets. The median and mode are generally used when the

mean is not representative of the distribution due to the presence of extreme outliers or because the data are skewed.

As described in the GRA hydraulic generation methodology, the mean generation was based on the average of 61 hydrologic sequences simulated over a ten year period, thus 610 values contributed to the average. The median generation, by definition, is based on only one hydrologic sequence – the one that results in the median generation. The median is therefore the average of only ten hydrologies, with all other data neglected. Since there is no reason to believe that the future hydrology will be more like this sequence than any other, using the median ignores useful data.

The hydraulic generation values estimated by Hydro's Vista DSS model, based on the 61 years of historic distribution of inflows, do not include any extreme outliers. The distribution does not follow any theoretical shape – it is somewhat skewed to the higher range but it is also somewhat bimodal. It is Hydro's assessment that, without a theoretical justification to use the median or the mode, it is correct to use the default measure of central tendency, the mean.