The Minzone and How Low Hydro Storage Levels Are Managed

There has been some discussion recently on the significance of the Electricity Commission's Minzone calculation and how the Minzone is updated. This briefing note seeks to clarify the situation about the Minzone.

The Minzone is an analytical tool that helps electricity system planners understand the data about hydro storage levels. It is based on the record of 74 years of hydro inflows into the storage lakes and is intended to provide a 1 in 74 security of supply standard (more conservative than the government's 1 in 60 year target). That is, in only one year out of 74 would there be shortage that would require further action.

Definition of the Minzone

As hydro storage levels drop due to lack of rainfall, the risk of shortage increases. If storage falls to the Minzone line, it means that from that point there is at least one annual inflow sequence out of the 74 on record which, if repeated, could result in empty reservoirs if no action is taken. It is important to remember that when storage is at the Minzone, there are still 73 out of 74 recorded hydro sequences which, if repeated, do not result in empty reservoirs.

Storage levels approaching, or at, the Minzone do not indicate a "crisis" situation but a need for careful management of the generating system.

When storage is at or below the Minzone, all thermal plants need to be running and all hydro generators need to be conserving water to the maximum extent possible. The Crown-owned Whirinaki reserve energy power plant will be turned on at the Minzone and run to its maximum output, if not already running due to high market prices.

Key Inputs and Adjustments to the Minzone

The Minzone is based on a number of data inputs: for example, the amount of water hydro generators can conserve above minimum outflow requirements, information about thermal fuel supplies, expected thermal plant outages, and the expected output of thermal generating plant.

The electricity market has a voluntary process for notifying plant outages. Expected outages can change as a normal part of operating thermal generating plant. For example, scheduled maintenance may not need to be as extensive as originally expected, or alternatively may need to be more extensive.

The Electricity Commission monitors the hydro storage situation and other data inputs continuously. It conducts the complicated calculations to update the Minzone when new information merits. Levels of plant outages lasting longer than previously notified can alter the Minzone upwards, indicating increased risk of shortage. Improved plant performance, for example a lesser time out of service than expected, or a cancelled outage would alter the Minzone downwards (lower risk of shortage).

In the April 2006 update of the Minzone, the Commission took into account updated information from Genesis about when a unit at the Huntly station would be fully returning to service. The updated outage schedule meant the output from this generator was expected to be significantly less in April and May, and the Minzone line was adjusted upwards.

Emergency Zone

In addition to the Minzone, the Electricity Commission sets an Emergency Zone below the Minzone. The Emergency Zone is calculated as the point at which risk of shortage is 1 in 10, in contrast to 1 in 74 at the Minzone line.

At the Emergency Zone, the Electricity Commission will institute an emergency conservation campaign, with public messages and possible other measures to induce reduction in electricity usage.

Having the Commission's campaign not start until the Emergency Zone is reached is designed to allocate the principal responsibility for managing the electricity system to the generating and retailing companies. It may be appropriate for the retailing companies to communicate a conservation message to their customers when storage is well above the Emergency Zone, as the risk of shortage increases. Only when there is a very high risk of shortage would Electricity Commission action be necessary and appropriate.

On-going Monitoring

It is important that there is independent objective analysis of the overall electricity supply situation. This enables all interested parties, both buyers and sellers of electricity, to have equal access to information on which to base their decisions. Until the Electricity Commission was established there was no body to provide such analysis. Although the Electricity Commission's analysis is independent, close liaison is maintained with the electricity industry to ensure appropriate coordination.

The Commission will continue to monitor the data inputs that influence supply and demand and update the analysis as appropriate. This will from time to time result in changes to the Minzone. Each week there is an update that considers only hydro lake storage levels, which is posted on the Commission's website.

(The current version of the Minzone follows.)

24 April 2006

NZ Minzone Guideline for Nov 2005 to Nov 2006 (Incl Whirinaki)

Taupo, Tekapo, Pukaki, Hawea, Te Anau & Manapouri

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