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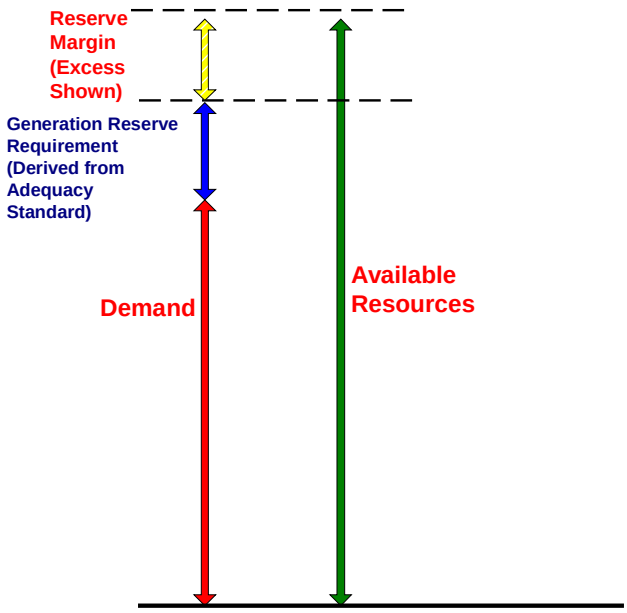
APPENDIX C

Determination of Generation Reserve Requirement

1.0 Method

The IMO uses a Load and Capacity (L&C) model to determine the Generation Reserve Requirements from week to week. The mix of generating plant, generating unit forced outage rates and the demand forecast are inputs to the model. A Generation Adequacy Standard of 0.1 days/year, or the equivalent corresponding percent Reserve Margin, is used to determine the Reserve Requirement for each week of the planning year. The adequacy of the available generation facilities to meet the demand over the ten-year study period, can be assessed from the forecast weekly Reserve Margin as shown in Figure C 1.

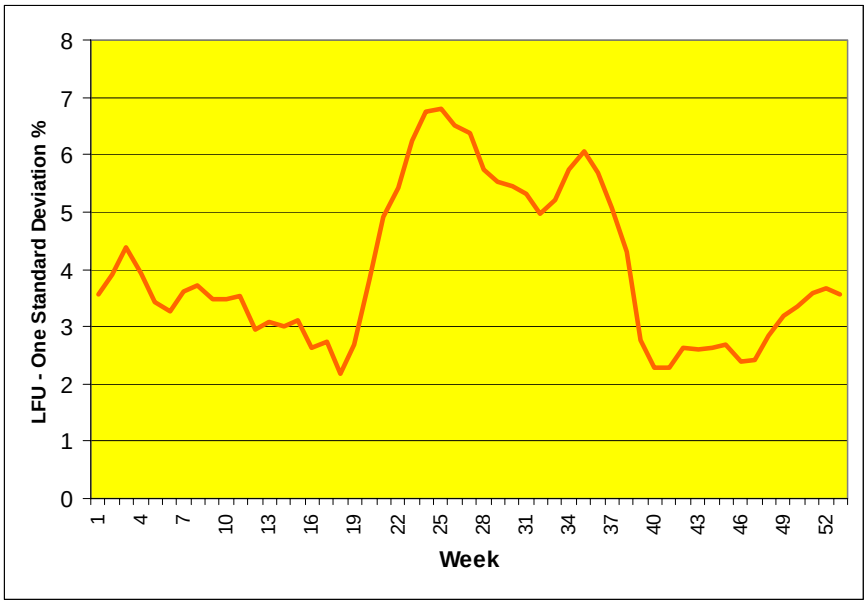
Figure C 1 Reserve Margin



2.0 Description and Basis of Demand Data

The demand model comprises weekly energy and peak demand data plus data related to the variability of the demand in any week due to swings in the weather. Hourly and 20-minute peak data is also derived. The description of the Demand-Weather relationship is based upon a four year record updated annually. The total energy demand is split into weather and non-weather components. A normal distribution of weather swings, in any week, is provided by input of the associated standard deviation. This data is obtained from 30-year weather statistics and is updated annually.

Figure C2 Load Forecast Uncertainty due to Weather



The standard deviation of weather-related demand ranges from 2% to 7% over the year, as shown in Figure C 2. The peak demand probability distribution in any week is thus available to the L&C program.

The demand includes loads that can be interrupted in case of a shortfall in reserves. For this study, the interruptible loads are included in the demand forecast. They are used as a contingency measure at the assessment stage, if a reserve shortfall is indicated. In such cases, an assistance amount of 600 MW is considered to be available.

3.0 Generating Unit Representation

3.1 Unit Ratings

Thermal generating unit are assumed to be capable of operating at a level equal to their normal Maximum Continuos Rating (MCR). Hydraulic station peak outputs are based on dependable (exceeded 98 % of the time) river flows determined from about 60 years of record. The peak and energy output of all combustion turbines vary considerably with changes in ambient air temperature and, hence, both summer and winter values are included.

3.2 Forced Outage Rates of Generating Units

Derating-Adjusted Forced outage rates for each unit are used that reflect both forced outages and periods of derated output. These rates are based upon experience in Ontario, and values published by NERC for the industry. Sensitivity studies are also considered with lower and/or higher forced outage rates. Short Maintenance outages are not included at the peak hours under study.

4.0 Study Procedures

For the years 2001 and 2002, the LOLP values corresponding to generation reserve levels of 18% and 19% respectively at the time of the January peak were calculated. These LOLP values were used to determine the Required Reserve in the remaining weeks of each year. For the years 2003 through 2010, an LOLP value of 0.1 days per year was utilized to determine the Required Reserve in each week of the year. The uncertainty in the demand forecast varies from week to week, and the available generation mix may also vary giving rise to a different Reserve Requirement for the Peak hour of each week. The risk is thus level throughout the year. Capacity available above the Reserve Requirement and Demand is considered to be surplus in any week and may be released for planned outages.