eurelectric
ELECTRICITY FOR EUROPE

Frequency Ranges in Continental Europe

VGB POWERTECH

- **Existing situation**
- **Requirements proposed by ENTSO-E**
- **Questions raised by Generators**
- **EURELECTRIC-VGB positions**

Meeting with ENTSO-E – December, 20th 2011 Stuttgart

Existing Situation: Continuous Frequency Range

- Frequency control ruled by UCTE policies
- TSO's target to operate in a range of max +/- 50 mHz under normal operation. [A1 – Appendix 1: Load-Frequency Control and Performance [E], 8]
- Requirements in existing grid codes are not harmonized
  - E.g. FR [49.5; 50.5]; PL [49; 51]
- Frequency Characteristics
  - Measured: mean 50Hz, standard deviation around 20 mHz
- Theory
  - probability of events into [49.95; 50.05] = 0.987
  - probability of events into [-10 mHz; +10 mHz] = 0.382
  - units experience 60% of the frequency deviations

Requirements proposed by ENTSO-E

- Continuous range [49; 51] Hz => IEC 60034 compliant
- Out, limited ranges are proposed not less than 30 minutes
  - IEC 60034: "Such excursions should be limited in value, duration and frequency of occurrence. Corrective measures should be taken, where practical, within a reasonable time, for example, a reduction in output." => non IEC compliant
- If the system will be operated with the objective to have a probability to be into [49; 51] equal to the actual probability to be into [49.5; 50.5]
  - Frequency characteristics would be : mean 50Hz, standard deviation around 40 mHz
- Probability of events into [-10mHz; +10mHz] = 0.197
  - Compared with today, units experience 79% of frequency deviations (1/3 more)
- If TSO's target is to keep normal operation the system in the same range of max +/- 50 mHz
  - Then, standard deviation is unchanged => no reason to extend the continuous frequency range.

Questions

- **Continuous range:**
  - Why proposing to extend the frequency range without justification?
  - Why consequences on generators have not been assessed?
- **Out of continuous range:**
  - Why 30 min minimum?
  - Why not proposing frequency of occurrences?
- **Consultation Process:**
  - Why ENTSO-E FAQ (110711- Pilot_Code_FAQ) does not answer precisely to frequency questions?
  - Why no links "operational security" code?
  - Why not having open a public discussion for the definition of the frequency ranges?

EURELECTRIC and VGB Positions

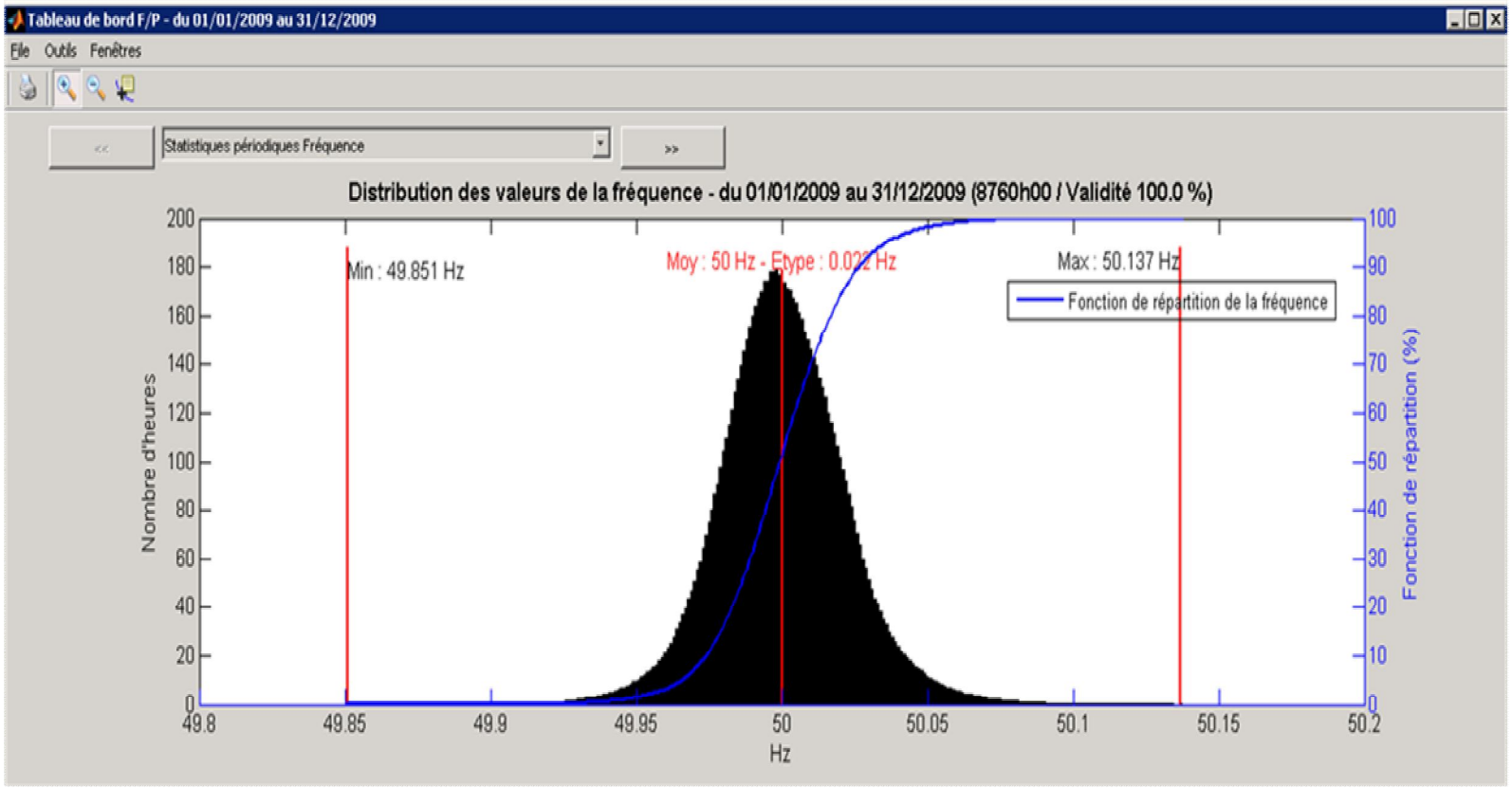
For existing units:

- **Continuous [49; 51] is not acceptable: cost-benefit has not been proven. Generators cannot bear such not assessed risk.**
  - **E.g. capacity of operating a generator at [49; 51] is not equivalent to the ability to perform frequency response in this range (IEC requires to declare "operating duty" to vendors)**

For new units:

- **Serious justification of the cost benefits, justifying the extension of the continuous range, shall be performed.**
- **Limited ranges out [49; 51] shall be fully IEC compliant. Consultation of generators requested on range values, durations and frequency of occurrences**

Frequency Observed by RTE - Jan 2009-Dec 2009



Calculations performed using http://www.wolframalpha.com