

Facilitating Wind Generation Connection in Ontario

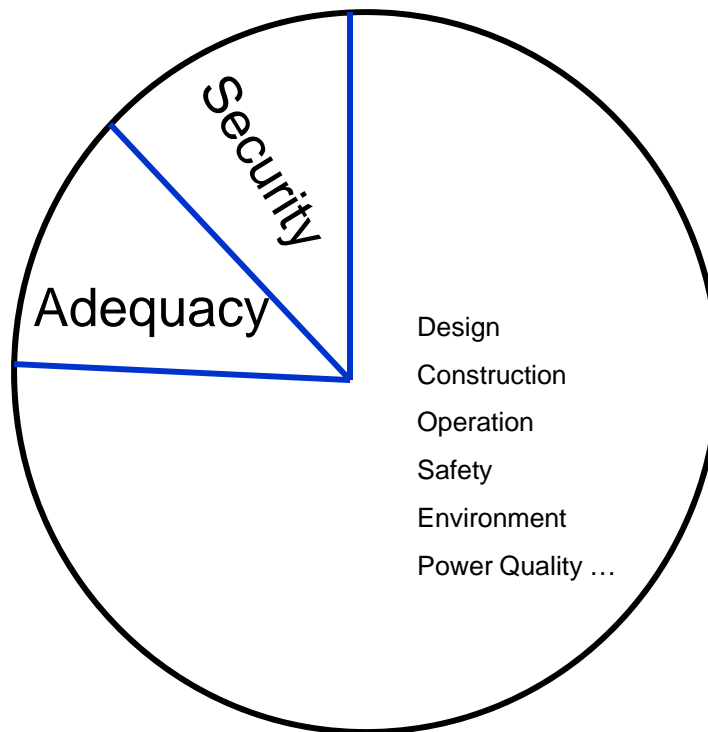
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- Standards
- Connections to the transmission system
- Visibility
- Facilitating connections embedded in distribution systems are now in an IESO stakeholder process and will not be discussed directly. Some aspects of facilitating wind generation is common to all connections.

- The IESO addresses only a few of the issues necessary for a good electricity system.

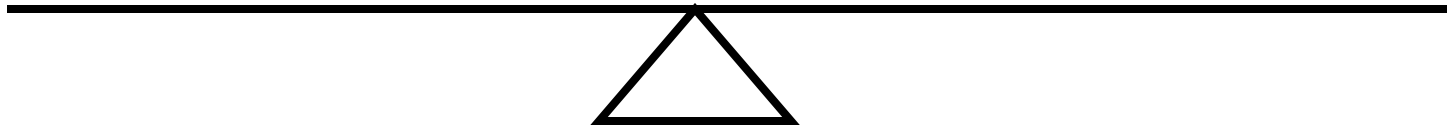


- Our goal is to have rules necessary only to maintain reliability and to promote economically efficient markets. A completely hands-off approach will result in some material adverse consequences to reliability.
- We feel that having relatively simple requirements that are consistently applied promote confidence that fair treatment is being received.

- The right to connect equipment is balanced by an obligation to demonstrate performance. Demonstrating performance has been greatly simplified.

Rights

Obligations



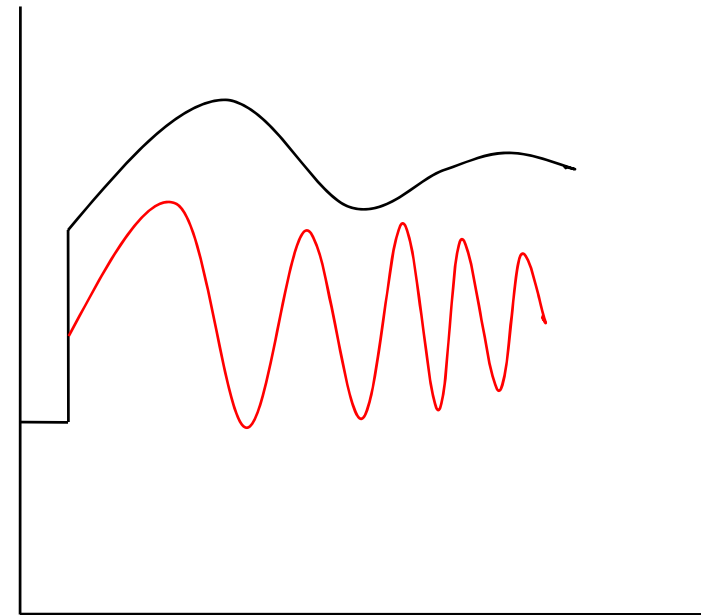
The validation process has been greatly assisted by vendors providing type tests.

On-site testing performance testing can be a major undertaking

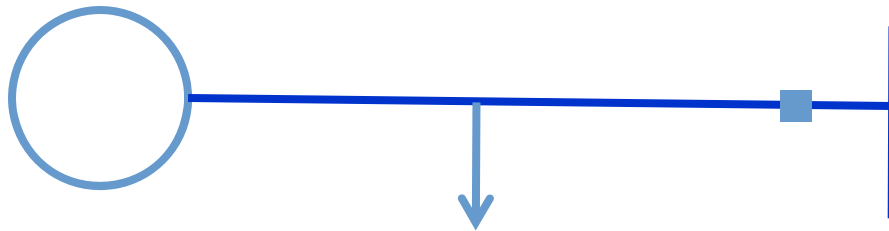


- Ensuring measured performance is at least as good as that assessed is the best way to avoid delays, restrictions or outright refusal to connect

Measured Simulated

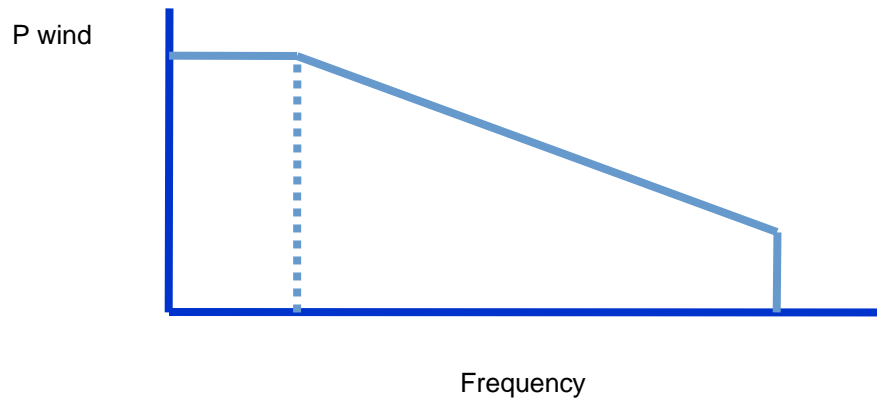


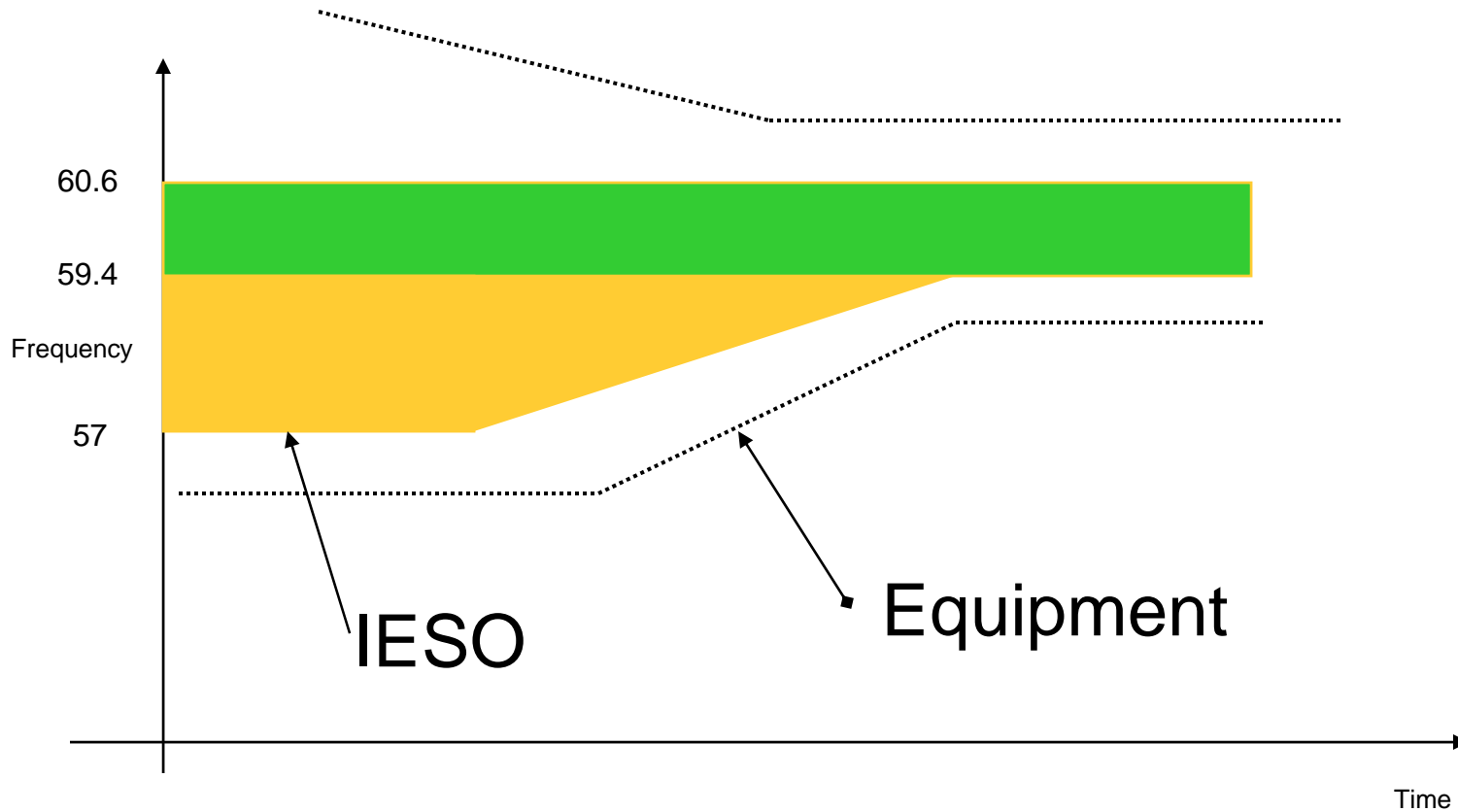
Wind generation is not the same as conventional generation and this will impose some challenges maintaining reliability.



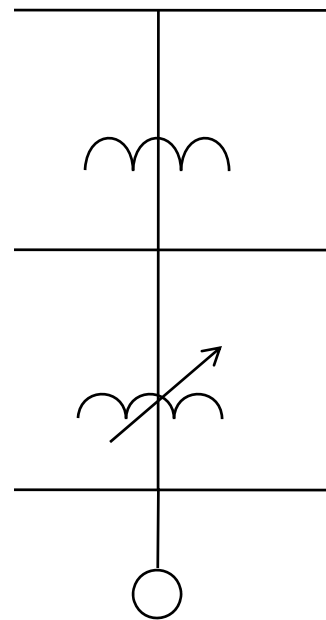
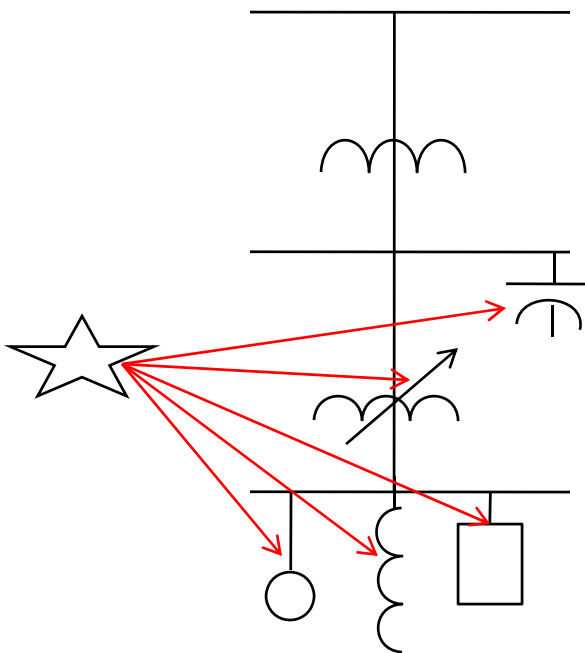
- Wind generation will displace generation that provides useful services to maintain reliability (inertia, voltage regulation, damping, frequency regulation).
- We are exploring the most efficient ways of replacing loss capability.

- Exploring the possibility of revising IESO requirements to include features that improve reliability at modest costs



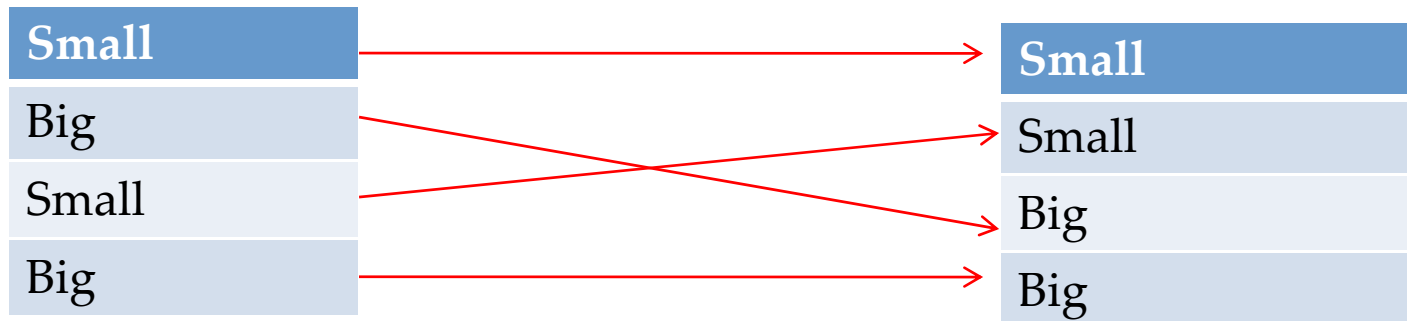


- We would like to make some rule changes to enable simpler more robust designs



- Our present rules have requirements interleaved - this results in some confusion

Changing the grouping of requirements will help



- Requiring detailed models at the beginning of our processes has not worked very well to this point in time.
- It may be more efficient just to clearly outline required performance

