Power Quality Limits
Update on Harmonics

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Introduction

- Observed trend of increasing harmonic voltage distortion on transmission network.
- Causes:
  - New underground cables introducing harmonic resonances (amplification)
  - New harmonic distortion introduced by power converters in WFPS
- Situation not unique to Ireland, but more pronounced due to size and characteristics of Irish system.

Introduction (cont.)

- Limitation on harmonics emissions from new connections is needed to remain within standards:
  - Requirement was previously in Grid Code but now needs to be enforced.
  - Recent Grid Code modification(*) to clarify roles, responsibilities and requirements expected of Users and TSO.
- Power Quality Limits already issued to a few new WFPS connections

(*) Ireland only

Power Quality Limits (*)

- Allocation of Harmonic Voltage Distortion Limits in accordance with IEC/TR 61000-3-6.
- Power Quality Limits document issued by TSO **18 months** prior to WFPS energisation, covering:
  - Purpose
  - Definitions
  - PQ limits
  - System Data
  - Background Distortion
  - PQ report requirements
  - Proposed methodology
  - EirGrid Policy on Harmonics
- PQ limits may need to be revised by TSO if connection agreement is modified.

(*) Ireland only

Power Quality Limits (cont.)

- WFPS to submit PQ study report to TSO **12 months** prior to energisation demonstrating that the facility is designed to comply with the PQ limits.
- TSO will review PQ study report and issue comments if necessary.
- Submission of PQ study report does not represent proof of compliance with limits.
- Compliance solely based on performance monitoring prior to Final Operational Certificate.

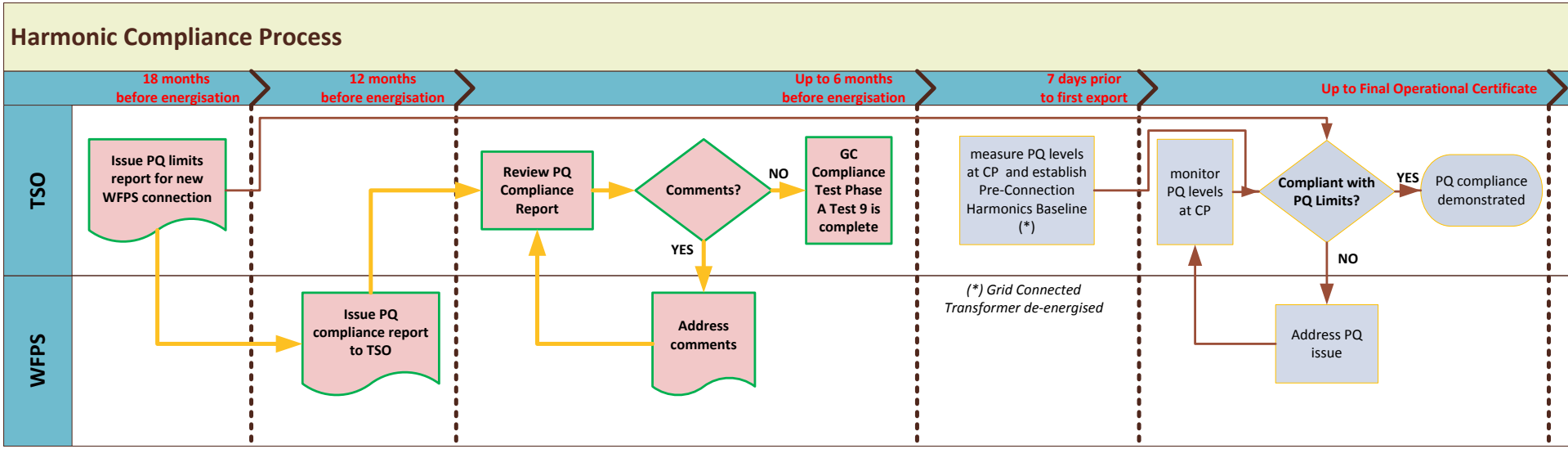
(*) Ireland only

Power Quality Testing

- Harmonic Voltage and Current measurements with Class-A devices, in accordance with IEC 61000-4-7.
- Harmonic background baseline created with minimum of **7 days** measurements prior to first export. IPP Transformer must be de-energised.
- Performance Monitoring over sufficient time period following connection to assess contribution from WFPS and compliance with limits.

(*) Ireland only

Compliance Testing Process



(*) Ireland only


EIRGRID
semo
Single Electricity
Market Operator
SONI
System Operator for Northern Ireland