

Transformer Recordings and Data

1 Overview

In order to obtain relevant insights into transformers, acoustic recordings need to be obtained and associated with the transformer qualities that are being assessed.

2 Recording Process

The recording device, whether a phone or a long-duration recorder, should be placed on the ground at the corner of the transformer, as close to the transformer as possible.

2.1 Long-Duration Recording

The recording process uses long-duration recording devices to capture the transformer acoustics at a high level of fidelity. We use 48 kHz and 16-bit PCM depth. Due to the data size, these devices must be mailed back to Bellwether, LLC for uploading and processing.

2.2 iPhone Recording

For short-duration recordings (< 10 minute), an iPhone app can be used that allows for immediate uploading to the cloud for further review. This app can be made available upon request.

3 Transformer Qualities

3.1 Power Qualities

All power qualities should be provided to as fine a granularity as is available (regarding decimal place and **how frequently it is measured**, i.e. 1-minute or 1-second intervals). Table 1 describes the power quality information associated with the **transformer** and the **individual phases**, respectively.

It is understood that not all of this information is available; Bellwether would appreciate as much of it as possible.

Values are requested per-phase and as an average over the time period.

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Table 1: Phase Power Qualities

Quality	Notes
Neutral current (A)	Provided to the hundredth of an amp
High voltage (kV)	Measured high voltage side; provided to the single volt
Low voltage (kV)	Measured low voltage side; provided to the single volt
Frequency (Hz)	Provided to the hundredths place
Primary current (A)	Provided to the single amp
Secondary current (A)	Provided to the single amp
Secondary loading (kVA)	Provided to the single VA
Power factor	-
Harmonic presence	Qualitative assessment of current harmonics (screenshot will suffice); only one per phase is required, not one every second

3.2 Transformer Metadata

The following qualities capture the requisite metadata:

Table 2: Transformer Metadata

Quality	Notes
Manufacturer	-
Class	-
Insulation type	-
Installation date	-
Dissolved Gas Analysis results	Precise figures are not necessary
Known issues	-
Historical issues	-

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