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## **ISSUE 5**

# NEWSLETTER AUGUST2021

### HARMONICS AND IT'S CAUSE AND EFFECTS

- Harmonics are distorted electrical waveforms that introduce inefficiencies into electrical system.
- They produce wasteful heat and can cause plant issues and fees from your local power company.

#### WHAT CAUSES HARMONICS

- Harmonics are the result of nonlinear load that convert AC line voltage to DC.
- Harmonics flow into the electrical system because of nonlinear electronic switching devices.
- Such as variable frequency drives (VFDs), computer, power supplies and energy efficient lighting.
- · Series and Parallel Resonance.

#### TYPES OF HARMONICS

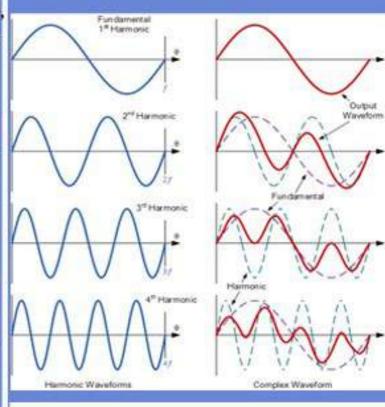
- Current harmonics cause unwanted current & overheating.
- Voltage harmonic cause misoperation of equipm
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#### **EFFECTS**

- Overheating (motors, transformers, cables, neutrals).
- Motor Vibrations.
- Nuisance Circuit Breaker Operations.
- · Electrical Fires.
- LED Lights Flickering.

#### SOLUTIONS PROVIDED BY APCS

Proper Selection of Harmonic Filtration System and other supporting equipments will be done based on the applications and Power Analysis at the particular Site.



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