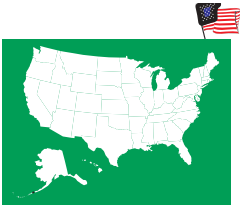


# AccuSine®

## Improves flight simulator reliability

USA



Corrects power factor and harmonics to allow UPS operation

At flight training facilities, the use of flight simulators is a great tool that provides safe training and is much more economical than using real planes. At a military facility in the USA, two flight simulators were required to operate 24 hours per day. Additionally, any power interruptions “cancelled” whatever simulation may have been in process generating lost performance hours. A decision was made to provide an uninterruptible power system (UPS) for these simulators.

Square D

ReactiVar™ AccuSine®

Power Correction Systems (PCS)



Each flight simulator is powered by a static frequency converter that converts 60 Hz power to 400 Hz power. Each converter is rated 75 kVA at 480 VAC. So, UPS manufacturers were consulted and a bid specification developed to provide uninterrupted power to both converters from the same UPS. Due to the harmonic signature of the frequency converters, a 300 kVA UPS was selected.



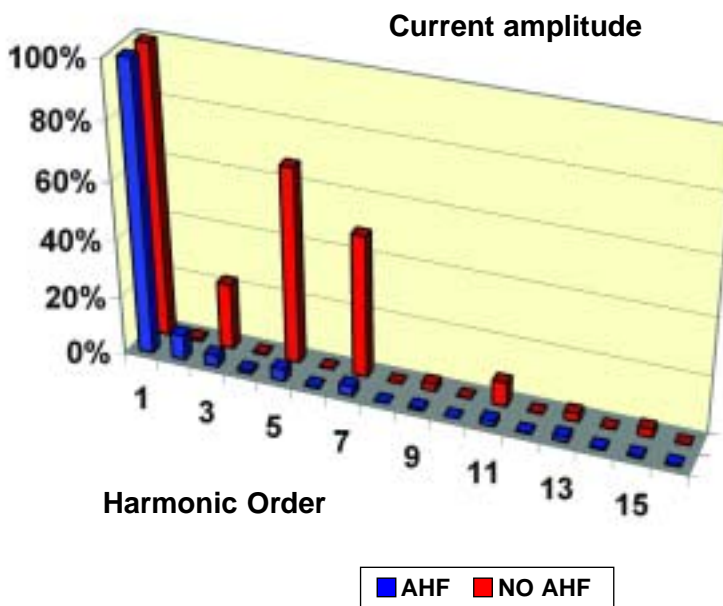
Unfortunately, due to the very high peak amplitude and the discontinuous nature of the current drawn by the power supplies, the 300 kVA UPS was unable to sustain both units at the same time. Various efforts were made to place passive filters at the frequency converter terminals. This resulted in interaction between this filter and the wave shaping output filter designed into the UPS.

The Square D AccuSine system was recommended as a likely device to remedy this situation. Placing AccuSine at the input terminals of the converters would greatly reduce the need for the UPS to provide reactive or harmonic current for the loads. AccuSine injects reactive and harmonic current as the load demands much like power factor capacitors inject reactive current for AC motors to correct for lagging displacement power factor. As a result of this successful installation, a flight crew of eight no longer has to train in a real aircraft, thereby saving fuel, avoiding unnecessary pilot risk, and saving taxpayers money.

For more information, contact the Schneider Electric Power Quality Correction Group at (905) 678-6699 or [pqc@squared.com](mailto:pqc@squared.com) or visit [www.reactivar.com](http://www.reactivar.com).

Measurement	Before AccuSine			After AccuSine		
	Phase A	Phase B	Phase C	Phase A	Phase B	Phase C
Fundamental RMS. Voltage (V)	282.7	282.4	282.0	282.9	282.5	282.3
<b>Fundamental RMS. Current (A)</b>	<b>56.46</b>	<b>53.87</b>	<b>48.80</b>	<b>38.74</b>	<b>35.43</b>	<b>35.52</b>
<b>True RMS. Current (A)</b>	<b>76.14</b>	<b>74.34</b>	<b>69.87</b>	<b>38.51</b>	<b>35.52</b>	<b>35.62</b>
Max. Peak to Peak Current (A)	347.0	343.1	313.8	129.0	122.1	120.4
Total Voltage Harmonics (%)	5.840	5.155	4.285	1.150	1.301	1.561
Total Current Harmonics (%)	85.00	89.09	93.07	10.39	11.53	13.02
Fundamental kVA	15.96	15.21	13.76	10.96	10.01	10.03
Fundamental kVAR	11.22	12.21	13.76	10.96	10.01	-0.227
Fundamental kW	11.34	9.107	9.496	10.96	9.972	10.02
<b>Fundamental Power Factor</b>	<b>0.710</b>	<b>0.598</b>	<b>0.690</b>	<b>0.999</b>	<b>0.995</b>	<b>-0.999</b>

*Effect of AccuSine on harmonic reduction*



**Schneider Electric**

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