



# SOLV™ Case Study: Harmonic Analysis Software diagnoses problem and recommends Mirus LINEATOR™ as best solution.

“It [the Mirus Lineator] worked so well the utility did not hesitate to reconnect the Hayes Plant to the transformer.” Jack Dinga, GM

## Background: Harmonic mitigation solution for Electrical Induction Furnace

### Challenge: Existing 5th & 7th LC Tuned Filters were completely ineffective

Hayes Metals is a small, specialty processor and marketer of recyclable metals, which they refine to custom specifications for customers around the world. Their operation, located in a suburb of Sydney, employs approximately 30 people.

The company originally operated with two gas-fired furnaces designed for small jobs. However, with these two limited-capacity furnaces, and an increased demand for recycled metals, Hayes simply couldn't keep up with customer demand. In order to increase production and boost the quality of their alloys, they purchased an electrical induction furnace, which has twice the capacity of the smaller gas-fired ones, can handle higher temperatures, and requires less manual operation.

When they spoke to the local utility about the power requirements for the new 1000 kVA furnace, the utility initially proposed a dedicated transformer to accommodate the new installation. However, because Hayes is located in an industrial area that borders a residential community, the utility decided to save money by installing a single, larger transformer to serve the

power needs of both the homes in the area and Hayes' new furnace.

The furnace came equipped with traditional fifth and seventh harmonic LC traps designed to mitigate the harmonics that would cause issues for the original dedicated transformer. However, when it started running on the shared transformer, the harmonic filter didn't work, causing high voltage distortion of up to 12% THD(V) on the secondary side of the transformer, which was also feeding the community. The result was a series of blown appliances, and other electrical equipment in homes – and a barrage of complaints to the utility.

The utility immediately disconnected Hayes from the transformer, and the only solution they offered was a temporary fix. They proposed reconnecting the Hayes operation to another industrial feeder line for a three-month period. But once demand for power increased during the upcoming warmer months, that line would no longer be available to them – and their operations would have to be cut back dramatically. Hayes had three months to find a solution that would allow them to continue operations – and fulfill orders that had already been promised.

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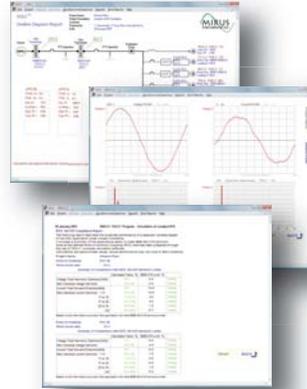
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## Solution: Using SOLV™ Software to analyse the power system before purchase

The Furnace supplier contacted a MIRUS International Inc. authorized distributor Angus Sankaran, Technical Director of Supreme Technology & Energy Solutions Australia Pty Ltd. Angus used MIRUS SOLV™ software to diagnose the problem and make recommendations for a solution. He determined that the Mirus Lineator would meet Hayes' needs. The company paid a significant premium to fly the Lineator from Canada to Sydney, Australia so it could go into operation as soon as possible.



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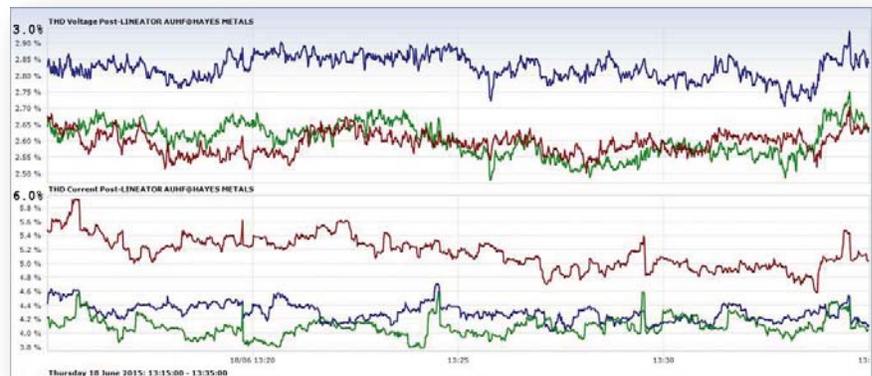
Mirus Lineator AUHF

## Results: Field measurements demonstrate excellent performance with Mirus Lineator

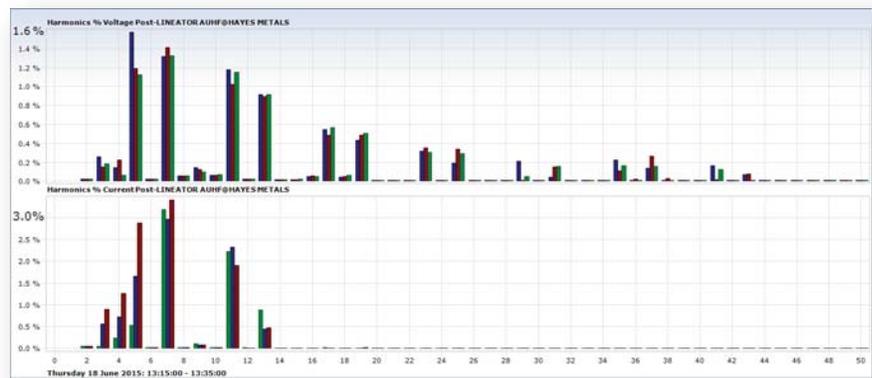
The Mirus Lineator did what the original harmonics filters couldn't. It worked perfectly, bringing the voltage distortion down to a very acceptable THD(V) of < 3%.

"It worked so well the Utility did not hesitate to reconnect the Hayes plant to the transformer they had been sharing with the community," says Jack Dinga, General Manager. "It is no longer affecting the community, and residential and industrial are able to comfortably coexist once again."

But the Mirus solution did more than just prevent damage. It saved 30 jobs. Revenue loss could have led to layoffs or even plant closure. Instead, the company has added more shifts to meet demand, and their production capability has doubled. Investing in the Lineator – and in expedited air transportation – has allowed Hayes to fulfill millions of dollars worth of orders, which simply wouldn't have been possible with the original two gas-fired furnaces.



THD Voltage and Current trends after Lineator was installed.



THD Voltage and Current spectrum after Lineator was installed.

To learn more about the Mirus Lineator and SOLV™ Software please visit [mirusinternational.com](http://mirusinternational.com)

### About Mirus International

Mirus designs and develops world class power quality improvement products for mission critical operations. Their uniquely specialized product line includes highly efficient harmonic filters, transformers, autotransformers and Data Center power distribution equipment. Comprised of a leading team of power quality experts, Mirus' solutions minimize disruption to the power supply, improve reliability and adhere to the strictest of regulatory requirements while also saving energy. Proven to perform, Mirus products are available globally and are real-world tested in its own Harmonics & Energy (H&E) Lab.