

# Amelin

Murmansk, Russia

## Project

44,000 PPH Modularized Boiler System

## Project Completion

May 2012

## Project Description

In 2011, WARE was contacted to complete a modularized boiler system for Amelin's Murmansk, Russia location.

The customer need a system that would produce 20 tons of steam per hour (44,000 lbs) and could be built in the U.S., disassembled, then shipped to Russia and reassembled on-site.

Negotiations began in Summer 2011 and continued into Fall. The build began in February 2012 and was completed in May 2012, when it was shipped to Murmansk.

## Case Study

Amelin

Murmansk, Russia

## Design/Build

44,000 PPH Modular Boiler System

## Project Timeline

2011 - 2012

## “You Put THAT in a Shipping Container?”

How WARE Designed and Built a Modular Boiler System in 4 Interconnected Containers

In 2011, WARE was contacted by Amelin in Russia, who stated they needed a boiler system—but that it would have to be built and tested in the U.S., then disassembled and shipped to Russia, where it could be reassembled and installed.

Not only that, but the system had to run on mazut—a thick, crude oil which has to be heated to 220F to be used.

Not one to turn down a challenge, WARE began negotiations with the customer regarding the design and intricacies of the project in August 2011.

These negotiations presented a huge risk for WARE. The company risked losing both time and money if they were unable to design a system that fit the customer’s challenging requirements.

After working through 15 different designs, WARE settled on a build that not only met the customer’s expectations, but provided the most economic value as well.

The build used 4 shipping containers to house the boiler system. The system featured 3 boilers, a feed system, a heating system, a water softener system, a blowdown system, an air compressor, and all the controls used to operate the equipment.

This project presented numerous challenges, one being the necessity to disassemble the system and reassemble it on-site. The project’s final design was informed by WARE’s experience building temporary units for its boiler rental fleet.

Additionally, WARE had to factor in the challenge of insulating the containers against Russia’s extreme cold during the winter.

The 550HP York & Shipley boilers only allowed about 1 inch of clearance on each side of the shipping containers, so standard insulation was not an option.

Instead, WARE decided to use 100ml thick spray-on insulation, which provided a 55-degree delta across the wall of the container, regardless of the outside temperature.

But the extreme winter cold wasn't the only thing they had to account for.

Steam production generates a lot of heat. So WARE had to design a system for cooling the units as well. This came in the form of louvers with actuators and fans that could pull in air and push it through the units.

The lack of space in the units presented challenges beyond heating and cooling the system. WARE also had to ensure the final design included easy access to all blowdown piping and valves, as well as fuel trains, oil trains, fuel pumps, and water columns—all of which were placed under the front of the burner to allow easy access.

And, while the boiler system was housed in 4 shipping container units, it couldn't seem that way from the inside. So, WARE cut 10-ft walkways between each container, so that, when entering the container, it would feel as if the entire system was housed in one boiler room.

But that presented its own challenges, as the walls of shipping containers provide most of their structural integrity. Cutting out large portions of these walls required the design and installation of support steel in locations where structural integrity might be weakened.

Despite the project's many complexities, WARE was able to start construction on the unit in February 2012 and complete it by April 2012, when the boiler was first fired.

The units shipped to the customer in the first week of May 2012—but the complexity didn't end there.

The customer had to undergo permit headaches for about 18 months before they could test fire the boiler. And then, the firing didn't go as planned.

So, WARE sent two technicians over to teach the customer how to correctly use the boiler and get the system up and running.

Since installing the system, the customer has been able to save hundreds of thousands of dollars per month in steam production costs.