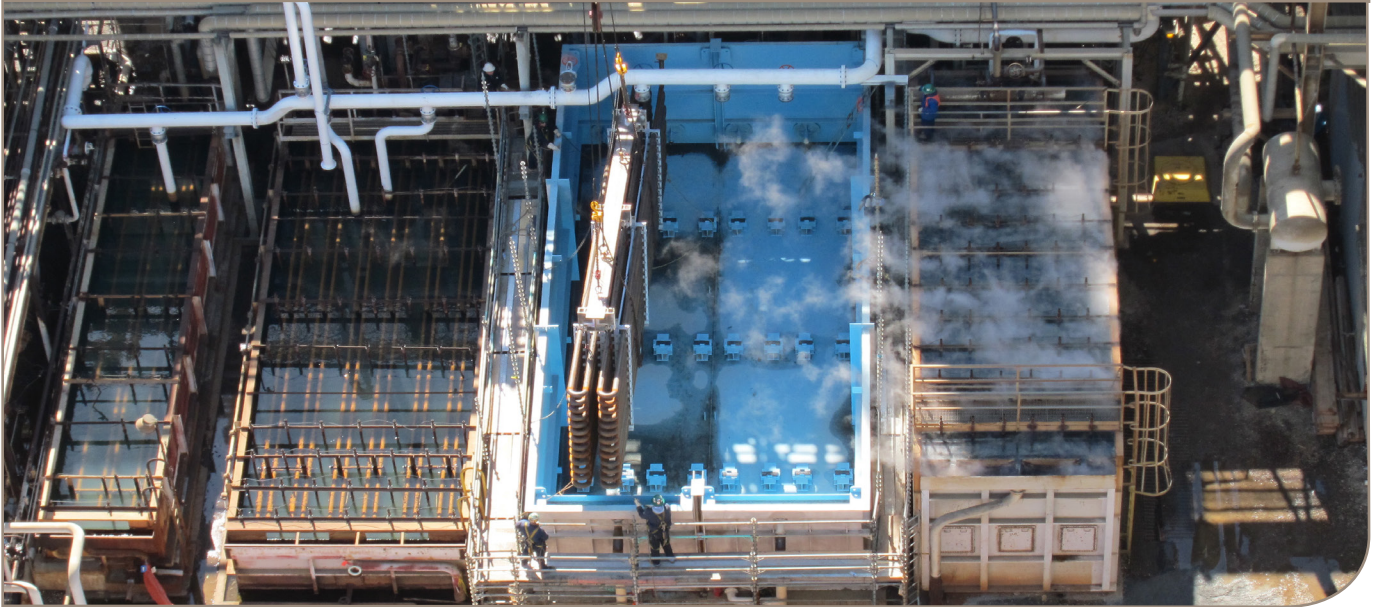




## Box cooler replacement

### Niagara box cooler case study



#### Refinery

**Location:** Great Lakes area

**Application:** Box cooler

#### The challenge

A Great Lakes refinery needed to replace their 50+ year old overflow box cooler, used during scheduled or emergency shutdown of their fluid catalytic cracking (FCC) process. The FCC is one of the most important steps in the refinery process as it converts hydrocarbon fractions of crude oil into gasoline and other valuable products.

#### The solution

A Niagara box cooler was custom designed and fabricated to include the entire coil and support system.

#### Advantages

- Custom designed with 2" and 3" sch. 80 carbon steel pipe
- Joints welded and x-rayed per customer request
- Ability to achieve critical oil outlet temperature even during the hottest summer months
- Direct cooling with lake water
- Able to withstand thermal shock with high inlet temps.

#### What is a box cooler?

A box cooler is a heavy wall serpentine pipe bundle submersed in a bath (box) of water. Process fluid is circulated through the inside of the serpentine pipe bundle, while cooling water is pumped through the bath (typically once-through) rejecting heat through sensible cooling. Box coolers are typically only used during scheduled shutdowns or emergency conditions. Since the process fluid sent to the serpentine pipe bundles is very hot (>400°F), they are designed for and to withstand thermal shock.

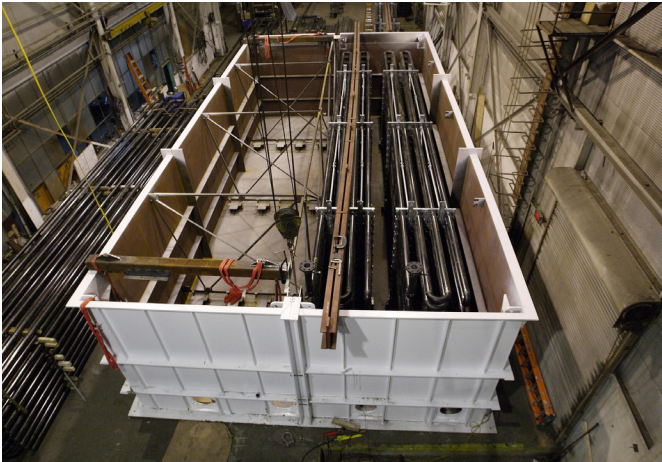
## Box cooler replacement



1. Overview of refinery



2. Placing the tank assembly into position



3. Tank assembly



4. Replacement coils placed into tank assembly

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