

# USD 105,000 saved annually through steam system improvements for a ready-to-eat snack manufacturer

 Thailand

 Food

## Problem

A leading manufacturer of tomato-flavored snacks and instant noodles in Nakhon Pathom, Thailand faced issues as follows in their steam trap layout for the dyer, oil heater and steamer.

### Dyer:

- The tray dryer was unable to achieve the set point temperature without opening the bypass valve of the thermodynamic trap (wrong steam trap for this purpose).
- The 5 zone dryer had group trapping, two thermodynamic traps and one float trap. 5 heating coils were split into 2 of 2 each (one with a float trap, and the other with a thermodynamic trap) and 1 coil having a thermodynamic trap. This resulted in coil leakage (3 times a week) and loss of steam along due to thermodynamic trap bypass opening.

### Fryer:

A single float trap was installed for two oil heating coils (group trapping), leading to coil leakage. The float trap had to be bypassed.

### Noodle steamer:

- The steamer was being supplied with excessive steam pressure (up to 2.5 barg).
- A direct acting pressure reducing valve (PRV) on the boiler steam line resulted in non-stable pressure (fluctuation).
- Additionally, the wet flash steam which was also being supplied to the steamer was affecting product quality.

### Condensate recovery from Building 3:

- Flash steam vented from the condensate tank.
- The infrequent discharge cycle of the electrical pump resulted in overflow of condensate from the condensate collection tank.

## Solution

Forbes Marshall recommended and installed the following:

### Dyer:

- Recommended individual trapping at each coil, along with replacing the existing thermodynamic traps with correctly sized Single Orifice Float Traps (SOFT) to effectively evacuate condensate, eliminating steam loss.

### Fryer:

- Recommend individual trapping for the oil heating coils to stop the coil leakage and bypass opening.

### Noodle Steamer:

- Replaced the direct acting PRV (pressure reducing valve) on the boiler steam line with a control valve (eVALV) to eliminate pressure fluctuation.
- Installed the moisture separator with a compact module thermodynamic (CMTD42M-F) steam trap to remove entrained moisture in the flash steam line.
- Reduced steamer pressure from 2.5 to 0.5barg.

### Condensate recovery from Building 3:

- A Flash Jet Pump (FJP80X) with Condensate Recovery Meter (CRM) replaced the intermediate condensate collection tank and electrical (centrifugal) pump, enabling recovery of condensate & flash steam back to both feedwater tanks with deaerator head.

### Before scenario at the Dryer



Wrong trap selection and bypass opening



Wrong trap selection and group trapping



125°C (257°F) observed temperature in common condensate line

### Before scenario at the Noodle Steamer



Manual PRV for steamer



Improper sizing of steam header



Group trapping (oil heating tank)

### Before scenario for condensate recovery

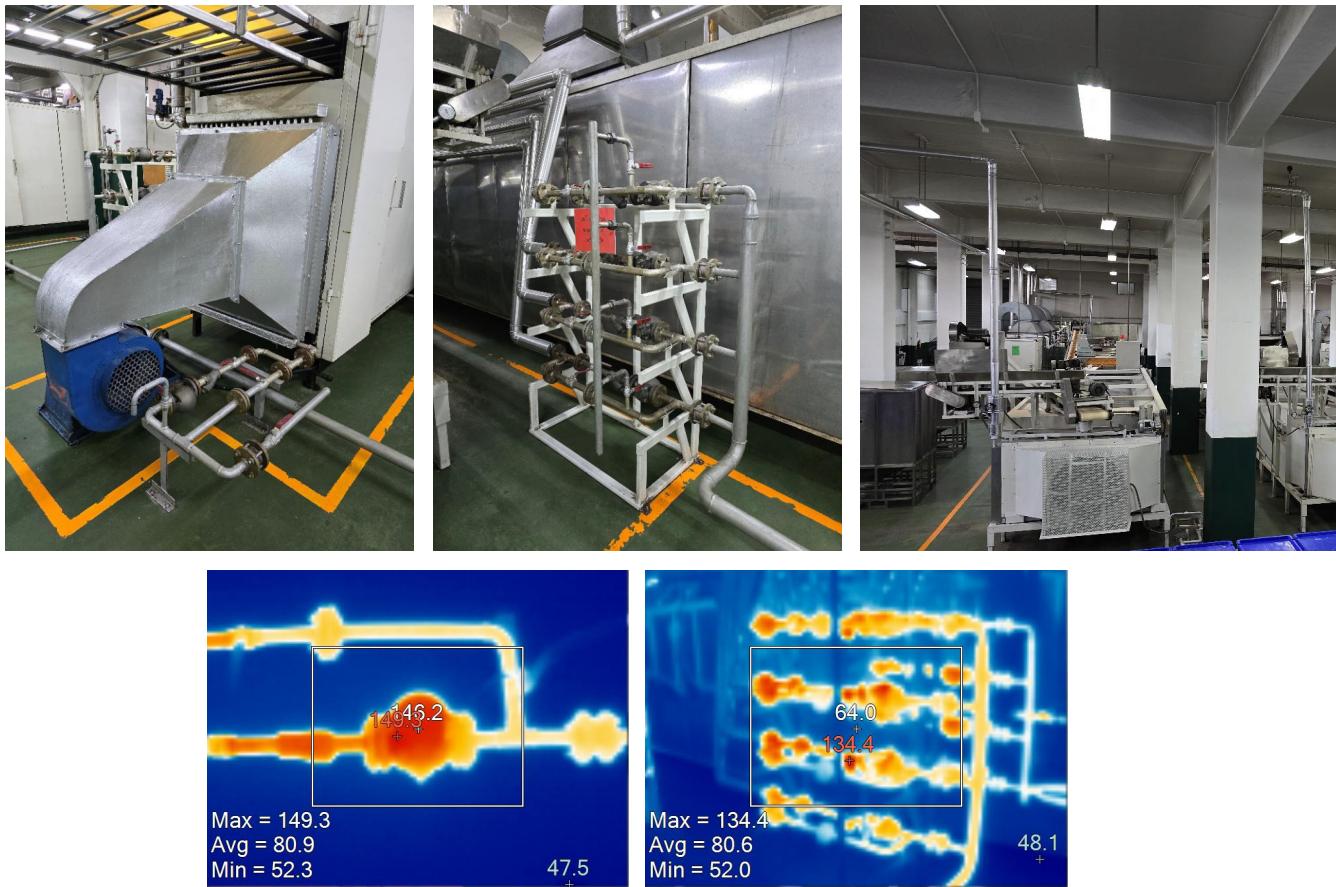


Condensate tank with electrical pump



Flash steam being vented

**Post installation of 28 Forbes Marshall steam-operated pumps traps (SOPT31) with accessories at the Dryer**



**Post installation of Forbes Marshall solutions at the Noodle Steamer**



**Post installation of  
Forbes Marshall  
solutions for condensate  
recovery**

*FlashJet™ Pump (FJP)  
installed for condensate  
and flash steam  
recovery*



*Condensate Recovery Meter (CRM)  
installed*

**Benefits delivered**

**Dyer**

Achieved the set point temperature without opening the bypass valve  
Rate of coil leakage decreased to almost zero  
Production rate increased due to the 10-minute faster heating process

**Fryer**

Achieved the oil set point temperature without opening the bypass valve

**Noodle steamer**

Coil leakage eliminated  
Steam consumption to the steamer reduced  
The steam dryness improved

**Condensate recovery  
from Building 3**

100°C (212°F) feedwater temperature achieved through condensate and flash steam recovery  
Feedwater tank overflow issue eliminated

**Overall**

Fuel saving 2.89 TPD (6371 Pounds per day)  
Water savings of 3,600 tonnes (806K Gallons)  
Flash steam saving of 7.10 TPD (15.6K Pounds per day)  
Annual heat energy savings of 3,464 million kcal (13,737 MMBtu)  
Annual CO<sub>2</sub>e reduction of 2,449 Tonnes (5.3 million Pounds)  
Annual monetary savings of USD 105,000 (~THB 3,394,650  
\*converted based on exchange rate)

