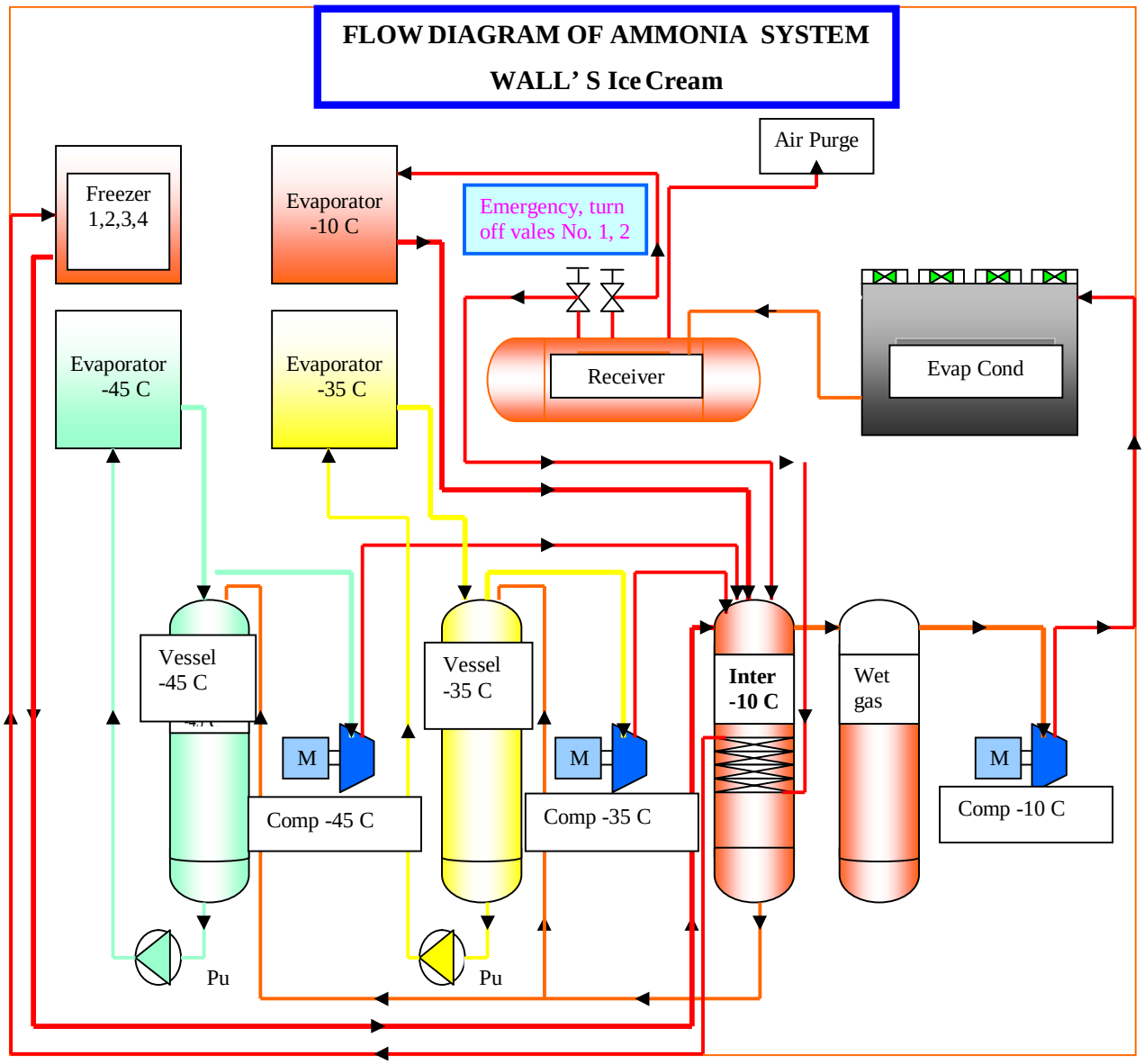
# Energy Saving of Wall's Ice Cream Factory

## Energy Saving Policy of Unilever Company

**Unilever realize on the value and important of using energy sources as energy is the main factor of production cost by providing the following practices.**

- **Define goal and plan according to energy saving policy.**
- **Control and Manage the energy consumption to reach the capacity by tracing and evaluating regularly.**
- **Design and develop machine and equipment to maximize performance.**
- **Encourage and support the using of replacing and reusing energy.**
- **Encourage and support training about energy saving for employee in any positions.**
- **Encourage and support employees to participate and cooperate in saving and managing energy.**
- **Restrict with all relevant energy saving laws.**

Cooling system of Wall's I Cream uses Ammonia as cooling substance with Screw Type compressor. Main problem is forming of scale at Tube in Evaporative Condenser causing heat unable to transfer enough. When the scale is continuously forming thicker, pressure at Discharge of ammonia tube will be higher. That leads to the increasing energy consumption. **The company use to solve the problem by scraping scale away from Tube Condenser and following by chemical**, which take long time, complicated, and high cost. The process has to be done every one and a half to two years.




## Conventional cleaning Evaporative Condenser method

Install stage, open both side covers

Scale at Tube Condenser

Cracking out Scale

Scale came off from tube 800-900 kgs.

## Problem solving was divided into 2 parts

## 1. Control pressure in Ammonia system

Pressure controlling of Ammonia system is to preserve the condition of Evaporate Condenser to remain clean and have a good heat transfer. By adding **Biochemical "Micro-nice® D-5"** into Evaporative Condenser, **D-5** will remove Scale out from Tube of Condenser and water Tube of Evaporative Condenser. Thus, heat can be transfer better as new Evaporative Condenser. D-5 can prevent and remove scale simultaneously. So, scale will not forming and stick at Tube and the system anymore.

**Add Micro-nice® D-5**

Scale at bottom of Tube

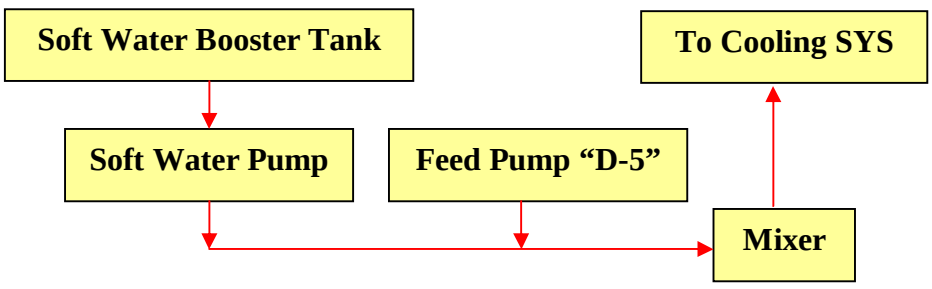
Scale fall out from Condenser Tube

Collecting Scale from Evaporative Condenser

After pressure in ammonia tube not go high, and then continue to expand using **D-5** in Chiller for a while until pressure in pump Freon feeder decline as the new installed one. In the past, company used to use chemical to clean Condenser of Chiller every 6 months. After using **D-5** in Evaporative Condenser and Chiller it can reduce maintenance time, chemical cost, and energy consumption from scale problem.

**Flow Chart Feed Micro-Nice® D -5**

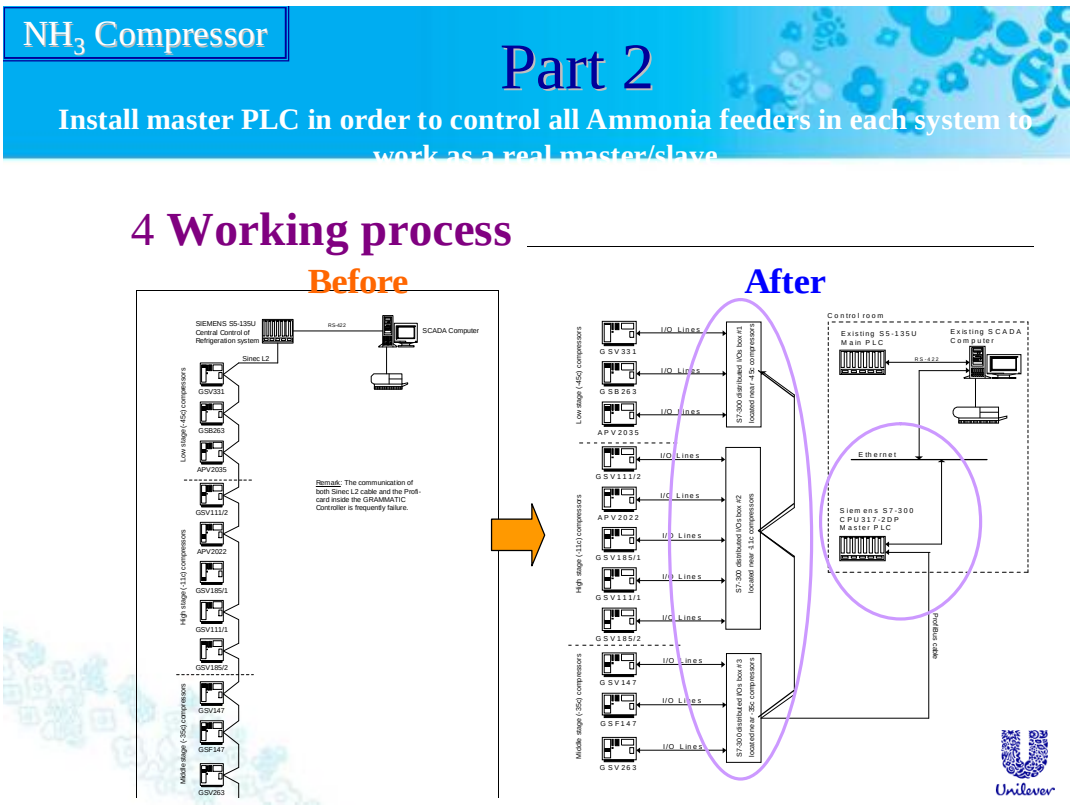
**Feed Pump "D-5" Tank**



## 2. Control work load system

When pressure in the cooling system of both Ammonia system and Chiller could be controlled, the second step is to set up the machine controlling system in each compressor to work according to work load requirement. Each compressor will be managed to work in their maximum capacity of the machine. If it's not enough for Load, the controlling set will order the next machine to work. When Load reduces, the controlling machine will stop the latest capacity that worked. Normally, many compressors run altogether and each compressor control themselves which are not reach their full capacity that cost high energy consumption.

**From these 2 developments, result is 5 million baht reducing of energy cost.** Moreover, this system could take advantage from tax reducing for energy saving that support by *The Department of Alternative Energy Development and Efficiency, Ministry of Energy* and The *Board of Investment of Thailand (BOI)* by refunding 30% of the amount that the company can save (not over 2 million baht). And this project had already passed the **audited** process from *The Department of Alternative Energy Development and Efficiency, Ministry of Energy*.




The upcoming project is to study the possibility of recycle water from production process to be use in cooling system.

**Approve By** .....

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