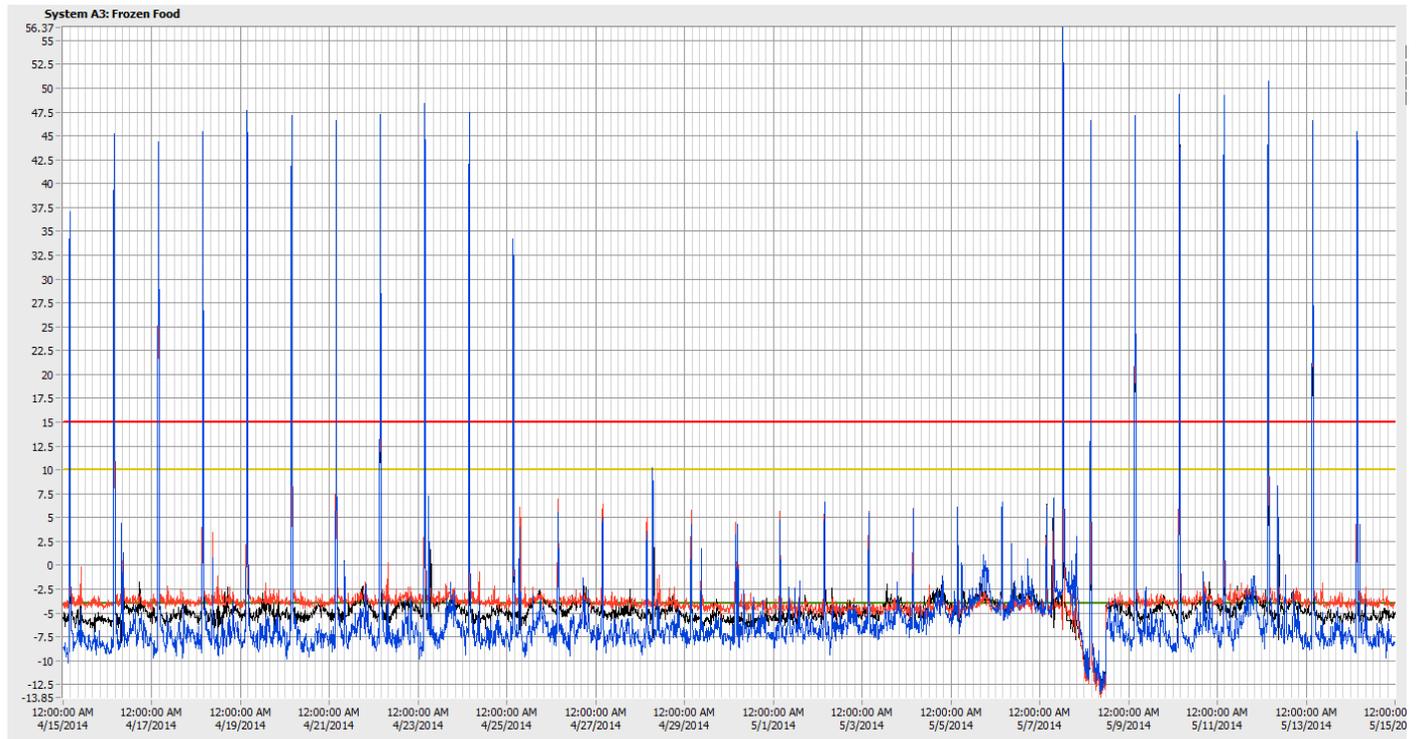


CASE STUDY

Defrost Heater Problem



Picture: 28 days of operation of three Frozen Food cases.

This refrigeration system serves Frozen Food cases. One day something happened!

The graph shows 28 days of operation of three Frozen Food cases. The green line is the setpoint of -4°F. The yellow and red lines are the alarm markers of High and HighHigh settings. Defrost runs once every day.

The Symptom: One day the defrost stopped functioning as it should; instead of defrost temperatures of 45°F the temperature increase was only minimal up to 5°F. As time passed the case temperature warmed up slightly because of icing on the evaporators which lower their efficiency.

The Analysis: There is little defrost activity. The temperature rise once every day is due to closing of the solenoid valve during defrost period which stop the refrigerant flow to the evaporators; as there is no cooling in the cases during this period they warm up quickly because of ambient air temperature.

The Problem: Defrost is generated by electrical heaters, these heaters are now without power as the control relays have bad contacts.

The Cure: Replace the control relay which had bad contactors.

The Recovery: Once the problem of the defrost heaters was fixed it took almost a day before all was back to normal.

Note 1: It took more than a week to discover this problem. It is a good practice to scan all sensor readings every day.

Note 2: A bad contact in relay may cause fire. All relays have a lifecycle and should then be replaced.

This VDVRM case study is from a serie of real-world examples from refrigeration systems monitored by VDV Refrigeration Monitoring system. The purpose of this serie is to bring forward actual problems, its effect on refrigeration temperatures, how the problem was detected and how the refrigeration system recovered.