Refrigeration Preventative Maintenance

Scope of Work

Overview

The purpose of this scope of work (SOW) is to help the refrigeration technician complete a thorough inspection and validation of all refrigeration equipment (monitored self-contained included). The technician is to ensure proper operation of refrigerated equipment by performing the actions and duties outlined in this SOW.

This program is executed throughout the year at all designated locations. Stores will receive one refrigeration PM work order per year. Stores receiving a remodel or gas conversion in the same fiscal year, will not receive a refrigeration PM work order. PFresh/Gen. Merch./Small Format stores remodeled two years prior and four years prior, will not receive a refrigeration PM work order. Select stores may receive two WOs per year. New stores receive WO 2nd year after Turn Over.

Expectations

Target Refrigeration Operations Technical Lead Team expects technicians to follow these basic guidelines:

- Work to be scheduled at vendors discretion within the LOS time period for WO #1 & #2
- Dispatch as first call of the day utilizing a single high-level technician
- Complete both WO#1 and WO#2 in as few of trips as possible
- It will the technician's responsibility to become familiar with all written SOW's related to the RPM program

Scope

Prework and Planning:

- Vendor will receive store lists with corresponding schedule dates (Cycles) for all stores, prior to the beginning of a new calendar year. Store schedules are subject to change and will be communicated to individual vendors on a as needed basis.
- Vendor will receive work orders from Target at least 1 week before the LOS start date.
- Refrigeration vendor is responsible to:
    - Contact Property Management Lead using the following email address convention: TXXXX.PML@target.com (where XXXX is the four-digit location number) with the week of the scheduled service with a request that the PML respond to acknowledge receipt.
    - Additionally, contact any other parties impacted by the program due to uniqueness of sites (malls, downtown areas/high-rises, etc).
    - Scheduled services shall be performed Monday through Friday starting during normal business hours.
    - Overtime is not allowed for this program.

Technical Execution/Best practices:

- ☐ Technician must call FMOC prior to shutting down any equipment. FMOC is to put equipment in test mode to prevent system alarms and subsequent work orders.
- ☐ Once service is complete and equipment has been restored, the technician is to call FMOC and remove equipment from test mode.
- ☐ FMOC phone number: 1 888 888 0304

- ☐ Complete Acid test on each compressor rack (test kit included in work order 1 NTE) Acid Test not required on CO2 Systems at this time.
  - a. For conventional systems use acid kit test equivalent to: Phase 3 Nu-calgon Refrigeration Oil acid test kit.
  - b. Note results of Refrigeration Oil acid test on WO 2
- ☐ *Check conditions of oil separator filter, oil line filter, liquid line dryer, and ensure suction filters have been removed. Transcritical CO2 stores will use Westermeyer coalescing element filter for oil separator.*
- ☐ Calibrate all pressure transducers (+/- 5% psi) and temperature sensors (+/- 5% degrees F).
  - a. If above 5% threshold, replace sensor and/or transducer
- ☐ Set/verify DDR/OLDR valve, condenser holdback valve, receiver pressurization valve, and gas cooler bypass valve (see Refrigeration PM Best Practices)
  - a. If the receiver pressurization valve does not hold set pressure and is an A8 please replace valve with an A9 (5/8 port 5/8 connection).
- ☐ Verify subcooler operation and ensure subcooler is achieving designed liquid temperature as found in Einstein controller.
  - a. Ensure no liquid is being injected into vapor injection header
- ☐ Verify and set all safeties on all compressors.
  - a. Compressor replacements are **not in scope**
  - b. Request corrective maintenance work order from PML if compressor needs replacement
- ☐ Verify proper operation for the condensers (including Fluid coolers, Evaporative condensers, Adiabatic condensers, Gas coolers, and Air-cooled condensers).
  - a. Request corrective maintenance work order from PML if condenser parts need replacement
  - b. If abnormally high pressure for ambient conditions, preform non-condensable test (see Refrigeration PM Best Practice)
- ☐ Water cooled systems
  - a. Verify pump skid is operational and pumps have equalized runtime
  - b. Use E2 to graph pump discharge and suction pressure to verify no leaks in the glycol system
    - A downward trend in graph may indicate a glycol leak and require further investigation
- ☐ Check and adjust superheats as needed
  - a. Ensure all evaporator fans are operational.
  - b. All cases on a circuit and evaporator coils in walk-ins should be within 1 degree of setpoint.
  - c. Verify rack S/H at suction header is operating within 25 to 50 degrees
  - d. EEPR valve should average 20-40% closed.
- ☐ Override all WattStoppers found on glass door cases (see Refrigeration PM Best Practice).

☐ Ensure receiver average levels are at the following

- 25-30% full condenser
- 30-35% split condenser,
- CO2 average should be 30-40%

☐ Super Target's may not fall under these parameters. Escalate through service manager to reach out to technical lead.

☐ a. Pull Einstein graph of rack receiver long term liquid level analog sensor control (RCVR-LV-LT) and identify if rack system has a slow leak.

☐ b. Leak check Racks, Condensers, Walk-ins, and Sales Floor Cases using electronic leak detection system and soap bubbles.

☐ c. Ensure leak detection systems are fully operational in all walk-ins, at the DCR, or in the PUC.

☐ d. Use test gas to validate PPM alarm threshold level for each leak detection sensor.

☑
- Use attached **detection calibration form** to record each leak detector alarm threshold. Once complete attach form to WO 1 (forms available in vendor SharePoint site PM SOW folder)

☐ e. Validate WI horns and strobe lights are functioning during the leak detection sensor test

☐ f. Validate alarm is registering on Einstein controller.

☐ g. Validate front office remote alarm horn, light and silence switch are functional.

☐
- Remote alarm horn will only be activated in the event of a refrigerant leak in the walk-in box, compressor room, and RTCR.

☐ Small format locations **and** select self-contained cases (including experience center, orchard bins, grab-n-go's, stockroom upright coolers/freezers, and order pick-up)

☐ a. Spot check air filters on condensing units (filters could be mounted on top or bottom of unit)

☐
- If dirty, contact PML to clean filters.

☐ b. Clean excessive dust/debris from condensers, fan cages, and fan blades. (Have PML validate that it's been cleaned)

☐
- CO2 can be used to clean. Damp rag should be held on back of components during cleaning to prevent dust from blowing on nearby food products.

☐ c. Spot check condensate drain pans, if applicable

☐
- If dirty, contact PML to clean drain pans. Cleaning drain pans is **not in scope**.

☐ ***Super Target's with Remote Headers****: Due to pressure drop with R448 & R449, the condensing set-point at 85F will not provide adequate liquid pressure to maintain case temperature. Because of this pressure drop the condensing set-point will vary depending on system characteristics. The condensing set-point has been determined and set by Target Refrigeration Authority (TRA) or Target Refrigeration Operations Technical Lead (TL) and should not be changed to operational guidelines.*

Materials:

- There will be no acceptable material on work order 1. NTE ONLY
- Acceptable items on work order 2 include:
  - Acid test kit
  - Rack oil filters and liquid driers
  - Case liquid line strainers (replace any plugged liquid driers with strainers)
  - Walk-in liquid line driers (do not replace with strainers)
  - Rack contactors
  - Condensing unit parts
  - Rack and case valve replace and rebuild
  - Sensors/control boards/leak detection devices (REMS parts to be ordered from EMC)
  - Fan motors for cases or walk ins (excludes condenser fans)
  - Walk in door parts-all types

- Walk in evaporator coil cleaning
- Case and walk in super heat/balancing
- Leak repair
- Refrigerant
- Oil
- Deicing cases

Not In Scope

- Self-contained refrigeration units including check lane coolers, Starbucks self-contained, food avenue, bulk ice, and pet fresh
- Compressor replacements
- Case cleaning services
- Rack Condenser Coil cleaning services
- Out of scope repair/replace items can be directed to PML who can create a corrective maintenance work order

Roles and Responsibilties

Vendor

- Schedule and execute program SOW within LOS dates provided on work order

Target Refrigeration Team

- Supply vendor with a list of stores and respective cycles
- Supply work orders to vendor 1 week prior to LOS start date
- Support vendor and store team's technical inquires to program
- Monitor and process work order proposals
- Track all call backs to site for work previously completed under PM SOW
- Monitor program cost and completion of all work orders

Store team

- Supporting check in/check out
- Providing access to equipment (as needed)
- CM work order creation as needed by vendor and as specified in store team SOW
- PML validation

Work order Definitions

Two separate work orders are issued to the service vendor in order to support this program.

Work order 1 (WO1)

- Work order 1 is issued to the service vendor for completion of actions as outlined in the above *technical execution/best practices* section of this document.
- LOS for work order 1 is 21 days (unless otherwise noted above)
- Not to Exceed (NTE) contracted dollar amount
- Utilize catalog contracted rate when invoicing WO1

Work order 2 (WO2)

- Work order 2 is for any additional parts or repairs that could not be completed within the NTE for WO 1
- LOS for work order 2 is concurrent with work order 1 (unless otherwise noted)
- **If WO2 extends past LOS**… technician must communicate an estimated completion date with PML
  - Please understand that Target guidelines dictate, PMLs are to contact service vendor and inquire on completion date on **ALL** work orders past LOS
- **Labor hours for WO2 are to be broken down, per task**
- Any other observations for repair should be shared with the PML. Vendor should work with the PML to create a corrective maintenance work order for items found outside of scope.
- Stores that do not require work to be performed on WO2 should be completed at $0 based on the following:
  - If no work was needed, complete the following steps:
    - Update to NTE to $0
    - Add a note in the long description: "PML validate at $0 per HQs request – No work needed"
    - Update to VCOMP status

        - DO NOT, UNDER ANY CIRCUMSTANCE, CANCEL A WORK ORDER (unless directed by Target HQ)
- In the event an error occurs with a work order and cannot be rectified by vendor, a replacement work order can be requested by contacting program manager.

Invoicing

- Work orders are to be invoiced within 7 days of work order completion date.
- It is important for vendors to meet all LOS deadlines. Target has provided each vendor with their specific site list as well as scheduled cycle dates prior to the program roll-out.
    - **Failure to meet the LOS deadlines for WO completion, SLAs, or pull-through proposal submittal, may result in cancellation of incomplete work orders and/or loss of sites for future cycles**
    - All work orders not in VCOMP or COMP statuses in Maximo 30 days after the LOS deadline will be subject to closure.

Validation

Target HQ responsibilities:

Review open work orders past LOS

Additional Resources-Provided via email to primary vendor contact

- Refrigeration PM Best Practices
- PM Operational Standards (Target ROG)

Revisions

Version 1 - 11/02/2023 RPM
CO2 Updates completed – 11/14/2023

TARGET	IRLDS Refrigeration Leak Detection Calibration Validation

Objective

To ensure Target is in compliance with local fire ordnances, vendors are required to complete the IRLDS/ RLDS Refrigerant Leak Detector Calibration Validation indicating a fire inspection has been completed. A copy of completed form must be left on site with the PML and attached to the Maximo CM or PM WO

Target Expectations

- Dispatch at your convince within the listed LOS
- Schedule for the first call of the day, using a single high level tech, spend as much time as needed to be thorough
- Complete is as few trips as possible (Target understands emergencies and unforeseen issue can pop up at any time)
- Field techs are required to be familiar with the SOW written process
- All leak detection parts/components must be ordered from EMC

Refrigerant leak detector test and validation process

Store # _______

Address ____

Service Company ____

Technician Name ___________________________________

Technician EPA License _______________________________

Refrigeration Contractor:

- Use trace gas to function test each leak detector zone
- Record the PPM alarm trigger level
- Validate Einstein alarm routing
- Validate WI outer annunciator and strobe
- Validate WI inside annunciator and strobe
- Validate Liquid Line Solenoid de-energizes on leak event
- Validate Remote Alarm Annunciator functions as intended
- Validate compressor room exhaust and intake function as designed

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

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_______	_______	_______	_______	_______	_______	______	______

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_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

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_______	_______	_______	_______	_______	_______	______	______

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_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

RT Refrigeration Transducer Calibration Validation

Objective

To ensure Target is in compliance with local fire ordnances, vendors are required to complete the RT Refrigerant Transducer Calibration Validation indicating a fire inspection has been completed. A copy of completed form must be left on site with the PML and attached to the Maximo CM or PM WO

Target Expectations

- Dispatch at your convince within the listed LOS
- Schedule for the first call of the day, using a single high level tech, spend as much time as needed to be thorough
- Complete is as few trips as possible (Target understands emergencies and unforeseen issue can pop up at any time)
- Field techs are required to be familiar with the SOW written process
- All leak detection parts/components must be ordered from EMC

Refrigerant leak transducer test and validation process

Store # _______

Address ____

Service Company ____

Technician Name ___________________________________

Technician EPA License ________________________________

Refrigeration Contractor:

- Use trace gas to function test each Walk-in leak detector
- Record the PPM alarm trigger level
- Validate Einstein alarm routing
- Validate outer annunciator and strobe
- Validate inside annunciator and strobe
- Validate Liquid Line Solenoid de-energizes on leak event
- Validate Remote Alarm Annunciator functions as intended

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

TARGET

Co2 Leak Detector Calibration Validation

Objective

To ensure Target is in compliance with local fire ordnances, vendors are required to complete the Co2 Leak Detector Calibration Validation indicating a fire inspection has been completed. A copy of completed form must be left on site with the PML and attached to the Maximo CM or PM WO

Target Expectations

- Dispatch at your convince within the listed LOS
- Schedule for the first call of the day, using a single high level tech, spend as much time as needed to be thorough
- Complete is as few trips as possible (Target understands emergencies and unforeseen issue can pop up at any time)
- Field techs are required to be familiar with the SOW written process
- All leak detection parts/components must be ordered from EMC

Co2 leak detector test and validation process

Store # _______
Address ____
Service Company ____
Technician Name ___________________________________
Technician EPA License _______________________________

Refrigeration Contractor:

- Use trace Co2 gas to function test each Walk-in Cooler, Freezer, and Compressor Rack leak detector
- Record the PPM alarm trigger level
- Validate Einstein alarm routing
- Validate WI outer annunciator and strobe
- Validate WI inside annunciator and strobe
- Validate Liquid Line Solenoid de-energizes on leak event
- Validate Remote Alarm Annunciator functions as intended

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
_______	_______	_______	_______	_______	_______	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
________	________	________	________	________	________	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
________	________	________	________	________	________	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
________	________	________	________	________	________	______	______

System Name	PPM	Outside Horn	Outside Strobe	Inside Horn	Inside Strobe	Einstein	LLS
________	________	________	________	________	________	______	______