STANDARD OPERATING PROCEDURE FOR MANAGING ALERTS FROM THE CHECKPOINT WIRELESS MONITORING SYSTEM

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1.0 SCOPE AND APPLICATION

The DEP Central Laboratory uses a CheckPoint Wireless Monitoring System (or CheckPoint System) to monitor numerous appliances that must be maintained within specific operating conditions. CheckPoint measures internal temperature and other vital parameters, and an alarm will activate when the monitored parameter exceeds or drops below specific thresholds for more than the acceptable period of time.

When an alarm activates, CheckPoint alerts users so that corrective action can be taken to save samples that are at risk of damage or total loss. Samples in the affected unit must be reported with data qualifiers if samples remain outside of acceptable limits for more than 8 hours. CheckPoint electronically stores monitoring data and corrective actions in a SQL database.

2.0 LOGGING IN TO CHECKPOINT

Log into CheckPoint software by entering user name and password (**Figure 1**). Contact Scientific Services Support for password information or if an account is locked due to inactivity. CheckPoint is also accessible via a web browser using Remote Desktop Services (RDS). To access OTIS instructions for using RDS open Internet Explorer, go to https://remotedesktop.dep.state.fl.us and follow the instructions. **Note: Your office computer must be on to access RDS.**

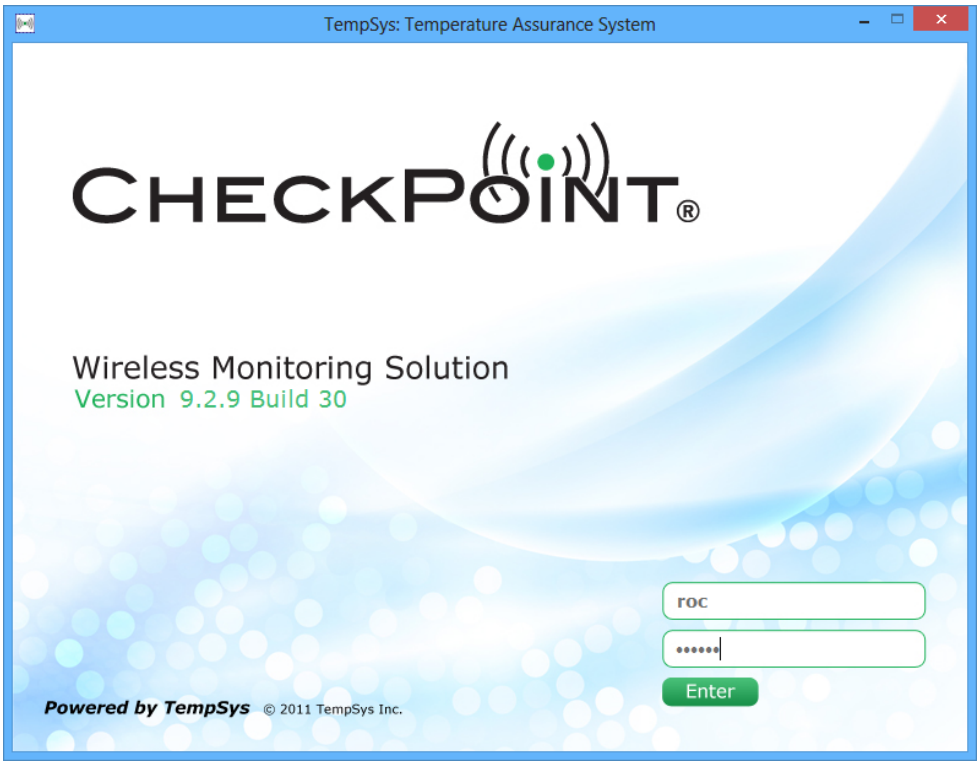


Figure 1 - Rich Checkpoint Login Screen

3.0 EQUIPMENT AND ALERT GROUPS

Appliances with CheckPoint probes are assigned to Equipment Groups based on laboratory sections and temperature monitoring requirements. An appliance can only be assigned to one Equipment Group. The current Equipment Groups are listed in **Table 1**.

Table 1 - Equipment Groups

CheckPoint Equipment Groups	
24 Hour Alert - Biology	Bench
24 Hour Alert - Nutrients	Inorganics-Metals
24 Hour Alert - Organics	Molecular
24 Hour Alert - Shared	Organics
24 Hour Alert - Soils	PM 2.5

Lab staff can be a member of multiple Equipment Groups. To view Equipment Groups and associated appliances select *Settings* → *Groups\Email Escalation* from the menu bar, select the group of interest from the list and click the *Edit* button. Staff may also elect to receive emails or text message alerts for the appliances in an Equipment Group. To modify Email or Alert Groups, select *Alerts* →*Email & Lamp Groups* from the menu bar, right click the group of interest and select *Edit*.

4.0 TWENTY-FOUR HOUR ALERT EQUIPMENT GROUPS

3.1 Ten appliances that are used for sample storage (**Table 2**) are assigned to 24 Hour Alert Equipment Groups. Chemistry and Biology supervisors rotate 24-hour a day on-call shifts every two weeks to ensure that alerts from these appliances are immediately addressed.

Table 2- Limits and Locations for Refrigerators and Freezers

Unit ID	Room	Temperature Range	Time Outside Range Before Alarm Activates
Refrigerator 1	C301	0 to 6.0 °C	2 hours
Refrigerator 4	C301	0 to 6.0 °C	30 minutes
Refrigerator 5	C301	0 to 6.0 °C	30 minutes
Refrigerator 6	C301	0 to 6.0 °C	2 hours
Refrigerator 7	C301	0 to 6.0 °C	2 hours
Refrigerator 8	C301	0 to 6.0 °C	2 hours
Biology Walk-in Freezer	B227	-30.0 to -5.0 °C	30 minutes
BOD Room	B212	19 to 21 °C	30 minutes
Biology Walk-in Refrigerator	B227	1 to 6.0 °C	30 minutes
Refrigerator 10	C201	0 to 6 oC	30 minutes

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3.2 The supervisor on-call rotation shift schedule is maintained in the "Alarm On-Call" calendar in Outlook Shared Calendars and can be updated as needed. Use the "Alarm On-Call" calendar to adjust the "On Call (Biweekly)" Alert Group in Checkpoint when the on-call shifts rotate. To edit the On Call (Biweekly) Alert Group, select *Alerts→Email & Lamp Groups* from the menu bar. Double-click the On Call (Biweekly) Email group and drag and drop recipient emails or phone numbers as needed. **On-call supervisors are advised to leave their office computers on during their shift so that they may access Checkpoint via RDS, if necessary.**

3.3 When an alarm condition occurs in an appliance listed in Table 2, both a text message and email alert are sent to designated responders to notify them of the alarm so that corrective action can be taken. On any given day, two supervisors are on call and must respond to these alerts. If a supervisor is unable to perform on-call duties it is his/her responsibility to recruit another supervisor to cover their shift and also to edit the "On Call (Biweekly)" Alert Group in CheckPoint (see section 4.2).

5.0 MANAGING ALERTS

4.1. If an email or text alert is received, log into CheckPoint if you have not already done so. Current alerts and a list of equipment viewable by the user is displayed on the dashboard. Locate the sensor of interest in the "Current Alert" window (**Figure 2**). The color-coding for each sensor is: **Green** = Within range; **Red** – Above upper threshold; **Blue** – Below lower threshold.

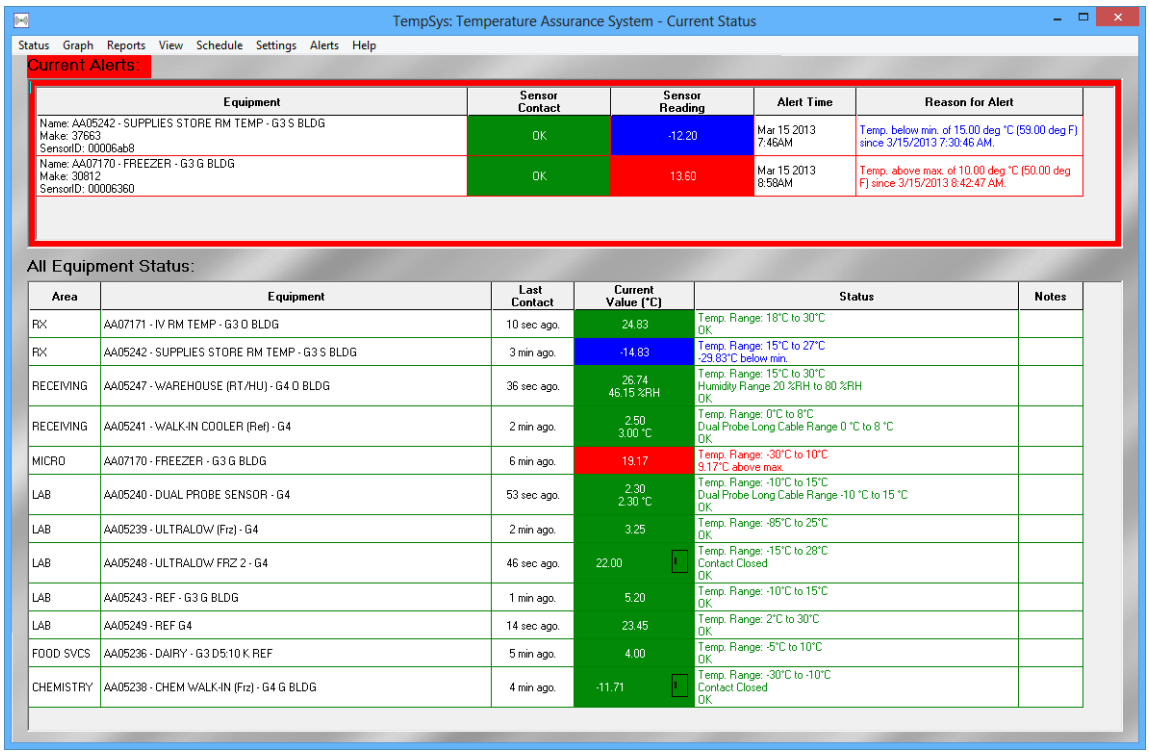


Figure 2 - CheckPoint Dashboard & System Status

4.2. Generate a graph for the appliance in alarm status. In the Current Alerts window, right click the sensor of interest and select "Graph It" (**Figure 3**).

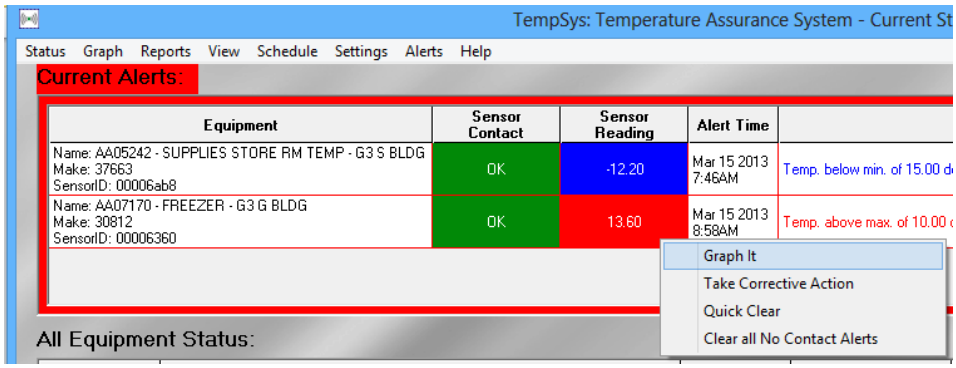


Figure 3 - "Graph It"

The graph in **Figure 4** illustrates that the temperature exceeded the upper threshold triggering an alarm.

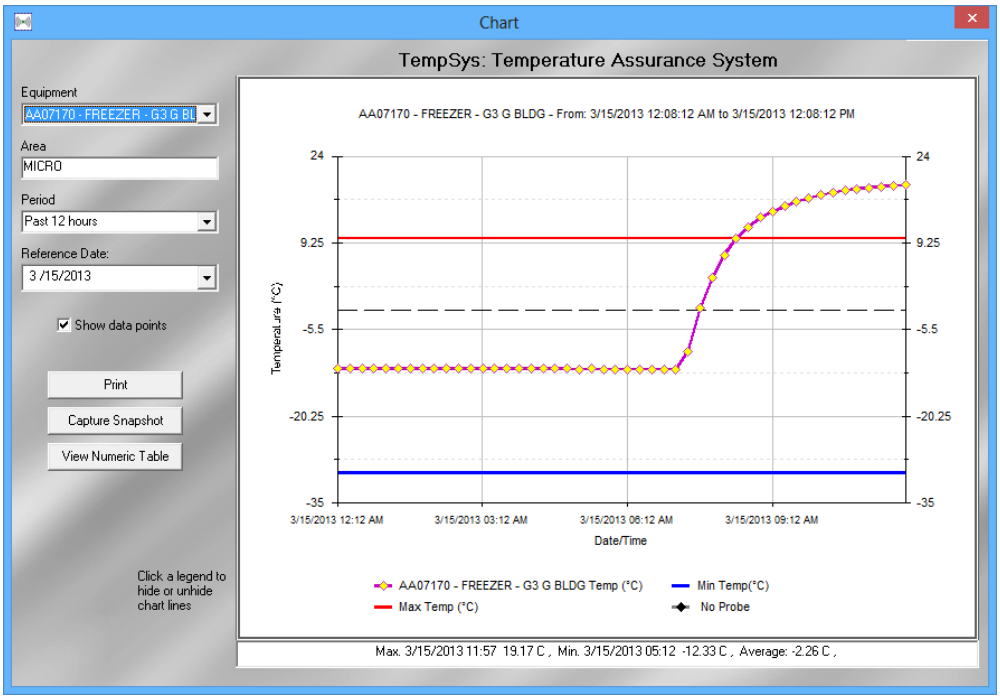


Figure 4 - Temperature Plot

4.3. If possible, physically inspect to the appliance to try to determine the cause of the alarm (e.g., door left open), and correct the issue if possible. If an on-call supervisor determines that repairs are required outside of business hours, contact the appropriate company. For units listed in Table 2, contact Brown's 24 hour service: (850) 877-2226. See **Figure 13** on page 13 for a diagram of rooftop compressor units.

4.4. Move Samples, if required. Samples may not be stored outside their required temperature range for more than 8 hours. If a unit cannot be repaired within that timeframe, transfer the samples to alternate storage locations.

- Samples in most small refrigerators may be moved to the larger walk-in refrigerators.
- Do not transfer samples to refrigerator 9. This unit is not monitored and is used for storage of highly contaminated, flammable waste samples.
- Do not move volatiles analyses (S-VOC.., W-VOC, etc.) samples to either the Biology walk-in refrigerator or refrigerator 5.
- Do not move empty sample containers. If storage space is limited, do not move samples that were collected more than 28 days prior.
- The walk-in freezer contains mostly fish samples and chlorophyll filters. The filters and fish tissue samples can be placed on ice, in a closed cooler in the Biology walk-in refrigerator.

4.5. Take Corrective Action. After addressing the issue causing the alarm (e.g., closing a door that was inadvertently left open), return to the CheckPoint dashboard, right-click the sensor of interest, and select "Take Corrective Action" (**Figure 5**).

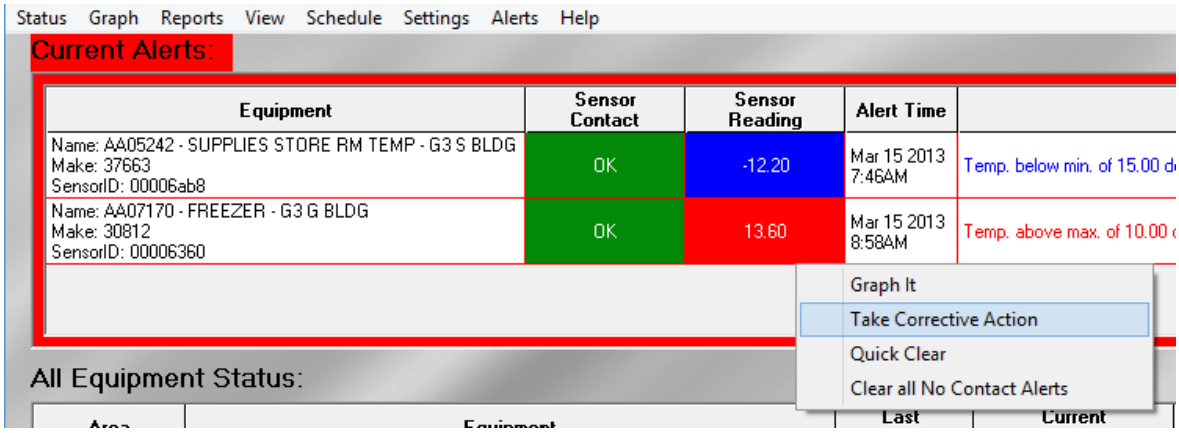


Figure 5 - Take Corrective Action

In the Diagnose Problem screen (**Figure 6)**, check all boxes that apply regarding the alarm and corrective action taken and click Next>>.

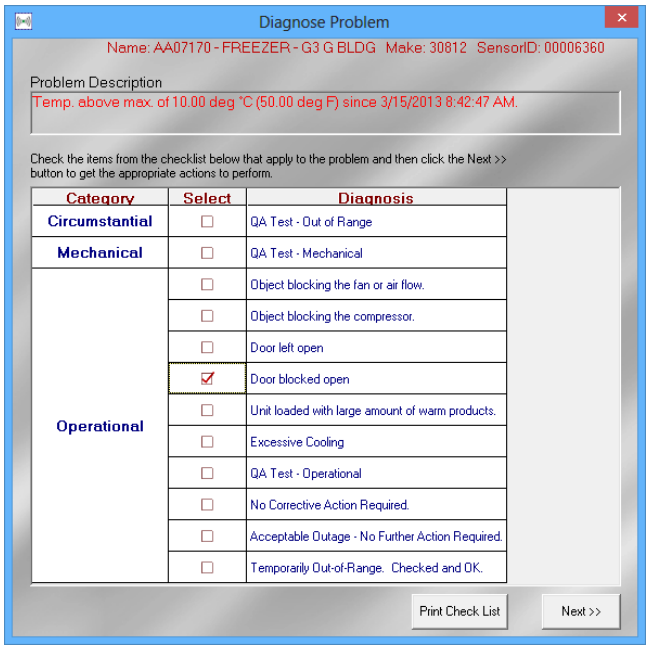


Figure 6 - Diagnosis Problem Documentation

Review the Corrective Actions screen (**Figure 7)**, which provides a detailed summary of the appliance that was in alarm status and the corrective action taken. The Corrective Action in the message box can be customized to contain specific instructions (e.g., "Contact John Smith at 123-456-7890 for further assistance."). Click Next>>.

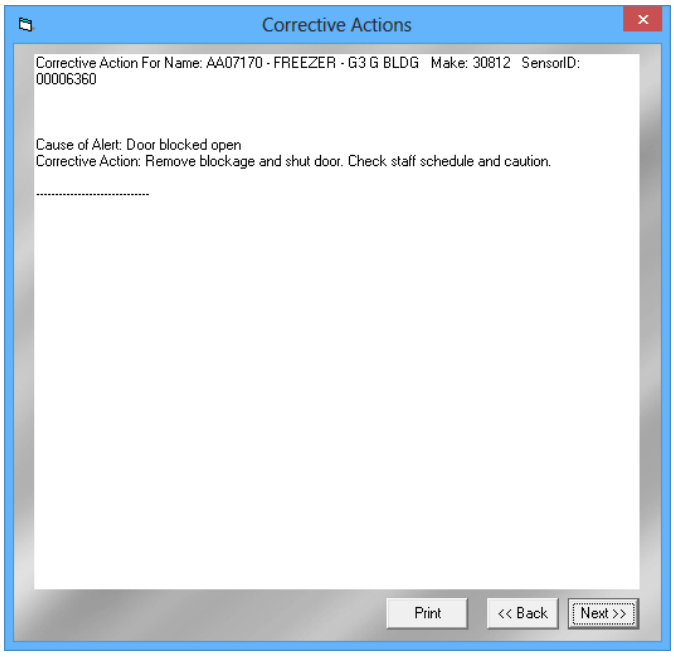


Figure 7 - Corrective Actions - Detailed Summary

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Enter in the name and condition of the sample in the upper box, and document the corrective action taken in the lower box (**Figure 8)**. Document all information to ensure compliance with regulatory and QA requirements. Select the appropriate radio button for "Is the equipment working properly": "**Yes**" fully dismisses the alarm with no further action required; "**No**" moves the alert to the "Corrective Action in Progress" window for further follow up. Click Save.

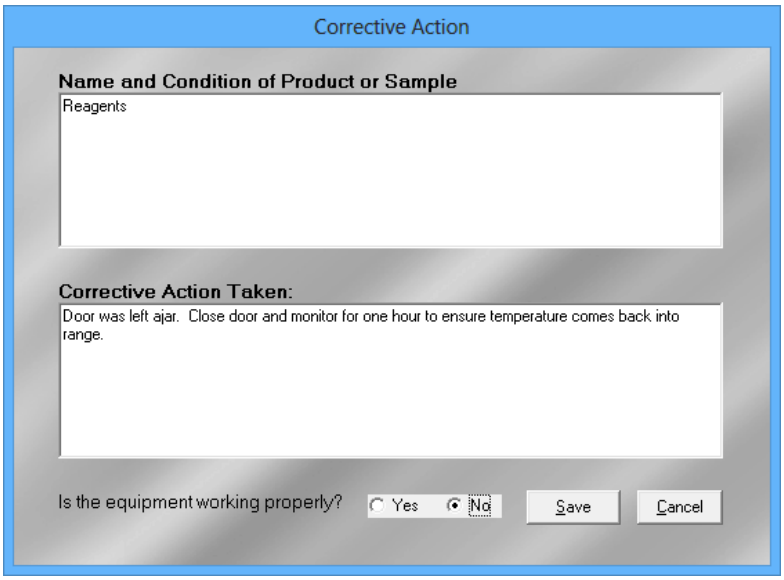


Figure 8 - Document Corrective Action Taken

If "Yes" is selected, CheckPoint will prompt the user for their electronic signature (**Figure 9**) and deactivate the alarm. Any recurring alarms are new issues that must be addressed.

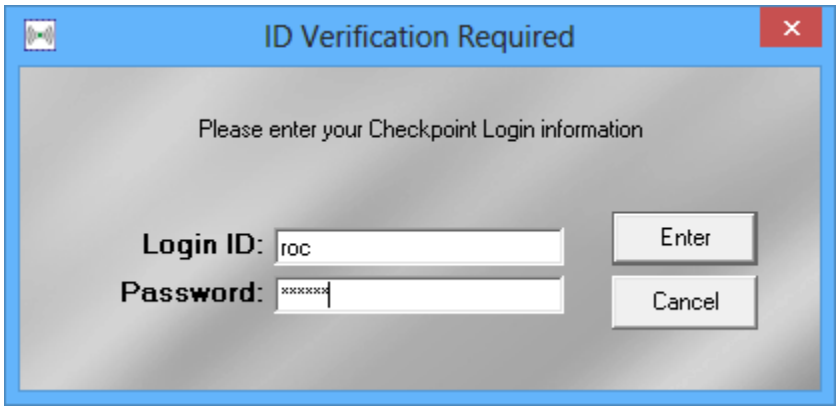


Figure 9 – User's Electronic Signature

Check the dashboard to ensure that the alert has been removed from the "Current Alerts" box. If "No" is selected under "Is equipment functioning properly?" the alert will be moved to the Corrective Action in Progress window for further follow up (**Figure 10)**.

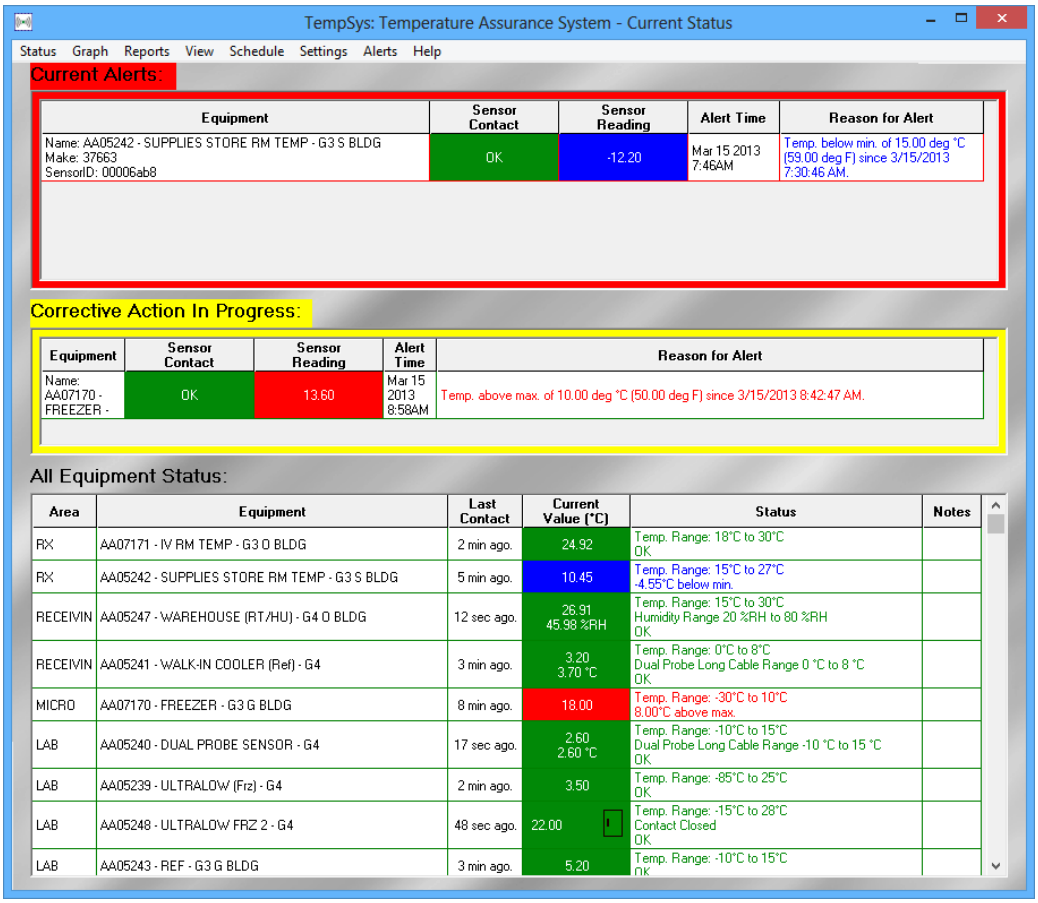


Figure 10 - Alert Moved to Corrective Action in Progress

6.0 CORRECTIVE ACTION IN PROGRESS

To follow up on an alert that has been moved to the Corrective Action in Progress window, right click on the sensor of interest and select "Process Further" (**Figure 11**).

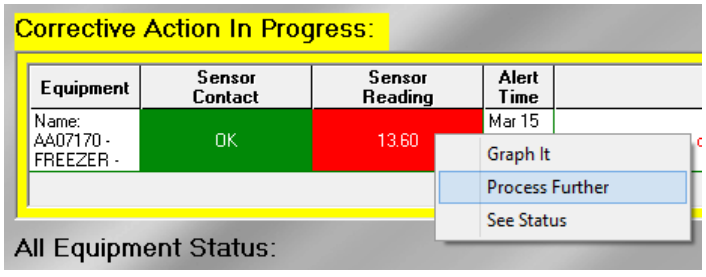


Figure 11 - Corrective Action in Progress Follow Up

Enter relevant information to finalize the corrective action documentation (see **Figure 8**). As with clearing current alerts, an electronic signature is required to complete a corrective action follow-up. When all alerts are addressed, CheckPoint displays "All Equipment Safe. No Alerts".

7.0 SYSTEM VERIFICATION / VALIDATION

Perform regular checks as described below to ensure that any alerts have been addressed and that CheckPoint is properly functioning.

6.1 Daily Status Checks. A CheckPoint Group Administrator from each section shall review the status of the appliances in their group(s) at least once per day. Group Administrators are required to save reports or numeric charts of temperature information including information relevant to their groups. See **Figure 12** for an example of an Alarm Test log Sheet.

6.2 Annual Probe Calibrations. Calibrate probes annually to a NIST-traceable standard. On or prior to the probe expiration date, exchange each probe with the new probes that have NIST Certificate of Calibration. Probes may also be calibrated using the lab's Fluke Calibration (refer to LB-035, Calibration of the Lab Thermometers using a Constant Temperature Calibration Bath). **Table 3** on page 12 lists additional system validation and user training recommendations.

6.3 Alarm Checks. Each Group Administrator shall conduct high and low alarm checks on sensors within their equipment groups. When testing alarms it is acceptable to change the Alert Threshold to a value that is less than the usual set point value to expedite Alarm testing. If the Alert Threshold is modified, record the change on the Test Log Sheet. Once testing is complete, reprogram the Alert Threshold to the original setting. Test the sensors by either changing the alarm threshold minimum and maximum values or by simulating values using an external reference, such as a temperature reference or ice bath.

6.4 Wireless Signal Integrity - Verify the wireless connectivity of the sensor meets Tempsys requirements for link quality and signal integrity by utilizing the CheckPoint Log Analyzer to analyze the G2Log.txt file in the \Windows\Temp directory on the CheckPoint application server. This function is performed by MesaLabs technical support in the event of connectivity issue.

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Date: _____

Figure 12 - Checkpoint Alarm Test Log Sheet

Notify appropriate staff by email before testing any alarms.

Sensor Name:	Sensor Type & ID No. :
Appliance Manufacturer/ Model #:	Sensor Probe ID.:
Asset Tag ID#:	Sensor Bldg / Rm #:
Reference Thermometer ID:	Calibration Expiration:

Change minimum and maximum temperature to verify alarm system is working.

Minimum temperature: _____ (C) Test minimum temperature: _____ (C)
Maximum temperature: _____(C) Test maximum temperature: _____ (C)
Alert threshold: _____ (hours/minutes) Test alert threshold: _____ (hours/minutes)

Test No	Test Result		Alarm Type		Test Methodology			**Signal Integrity** Link Quality (% LQ)	Notes & Comments
	Pass	Fail	Low Alarm	High Alarm	Change Min	Change Max			

Low temperature reset to correct minimum? _____ *(initial)* _____ *(date)*

High temperature reset to correct maximum? _____ *(initial)* _____ *(date)*

Alert threshold reset to original time? _____ *(initial)* _____ *(date)*

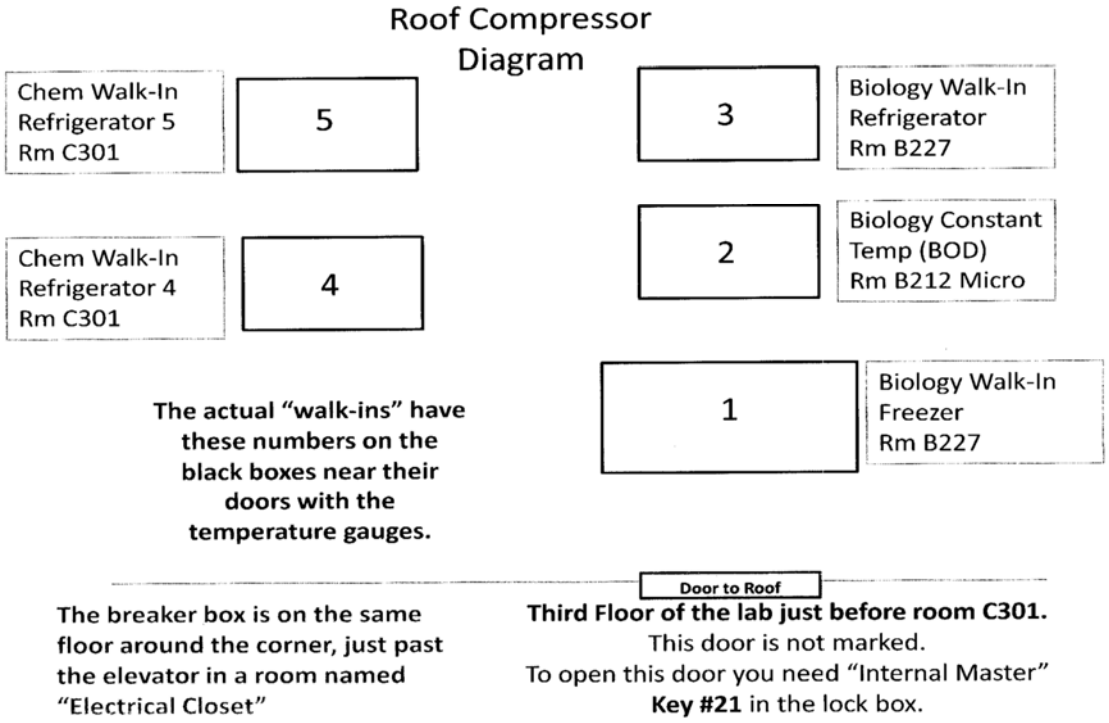
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Table 3 - Recommended Annual System Validation & User Training

#	Description	Notes & Comments
1	Probe Calibrations with a new NIST Certificate of Calibration	Snap Calibration Exchange
2	Replace sensor batteries, as applicable	Minimum voltage 2.9 V
3	System repairs and preventive maintenance	As needed and where applicable.
4	Update CheckPoint application software on the server and user rich client software, as applicable	Upon approval of update (minor change) or upgrade (major change)
5	System Verification and Validation as set forth in sections 4.1 and 4.2, respectively 4.1 System Status of Health (SOH) Verification 4.1 Alarm Checks & End-to-End System Validation	Procedures and acceptance criteria as approved by customer's QA.
6	User Training (a) Basic User (b) Administrator (c) Basic Installation, Troubleshooting & Preventive Maintenance Training	All attendees must sign Attendance Sheet.
7	SQL Database Backup – IT to verify daily backups of SQL database are successfully completed.	Full backups can also be scheduled within CheckPoint from the Server menu: Schedule → Backup.

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Figure 13 - Roof Compressor Diagram



8.0 NOTES

CheckPoint is compliant with the FDA 21 CFR Part 11 Electronic Records regulation, and meets or exceeds requirements to comply with the following regulatory agencies: Joint Commission, FDA, CAP, AABB, CLIA, USP 797, and State Board of Pharmacy.

Tempsys is accredited by the American Association for Laboratory Accreditation and is an ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994ISO/IEC 17025 accredited calibration laboratory. All sensors include a NIST Certificate of Calibration and optional A2LA certification. Tempsys is the manufacturer of the CheckPoint wireless temperature monitoring system and installs, validates, and supports the CheckPoint system.

In Case of Freezer or Refrigerator Breakdown, contact:

Brown's Commercial Refrigeration
4020 Woodville Hwy #D
Tallahassee, FL 32305
24 hour service: **(850) 877-2226**