

New York City Housing Authority
Action Plan – Heating

Contents

A. Introduction.....	2
B. Background	4
C. Heat Outage Response	6
1. Responding to Heating Complaints.....	6
2. Responding to Apartment Temperature Sensors.....	9
3. Responding to Heating Plant Alarms	9
4. Third Party Managed Sites	10
5. Making Asset Repairs.....	12
6. Flooding.....	14
7. Long-term Outages	15
8. Individual Action Plans	19
D. Resident Communication	21
9. Outage Notification	21
10. Tenant Association and Elected Official Outreach	22
11. Resident Data Collection	22
12. Resident Not Home	23
13. Alternate Heated Community Spaces and Warming Centers	23
14. Additional Protocols for Vulnerable Residents.....	24
E. Evaluation and Improvement.....	25
15. QA Root Investigation Plan	25
16. Predictive Analytics.....	27
17. Resident Communications Evaluation	28
F. Operations Infrastructure for Heating Outage Response.....	30
18. Heating Management Services Department	30
19. Office of Emergency Management.....	34
20. Stakeholder Engagement	35

A. Introduction

The January 31, 2019 agreement between the New York City Housing Authority (NYCHA), the U.S. Department of Housing and Urban Development (HUD), and New York City (hereinafter the Agreement) outlines a schedule of milestones and requirements relating to the provision of heat at NYCHA, the identification and response to heating shortfalls and outages, and related matters.

Paragraph 35 of the Agreement requires NYCHA to prepare Action Plans setting forth policies and practices to be adopted and specific actions to be taken by NYCHA to achieve all of the requirements of the Agreement, including those related to heat.

Obligation 8 of Exhibit B of the Agreement further requires:

By October 1, 2019, NYCHA shall establish an Action Plan that identifies, for each development, how NYCHA will respond to heating outages, taking into account resident populations, historical data about prior outages, the availability of on-site and remote maintenance personnel, and response times. The plan shall include provisions for alternative heated community spaces for heating outages that are expected to last for a substantial duration. The plan shall also address NYCHA's policies for closing out work orders when the resident is not available at home or otherwise does not provide access to his or her apartment to resolve a heating outage. The plan shall be made available to residents and posted online.

As approved—and updated periodically as required—this action plan reflects the policies and practices to be adopted by NYCHA, and specific actions to be taken by NYCHA, to fulfill heat-related requirements under the Agreement. To ensure implementation and ongoing compliance with this Action Plan, NYCHA commits to the following steps:

1. IT will post the Action Plan on its public-facing website, as required by the Agreement, upon approval.
2. The Heating Management Services Department (HMSD) Director began hosting training for all HMSD Borough Administrators, Superintendents, and Assistant Superintendents at the HMSD Director's meeting on December 2, 2019. The Director provided an explanation of the intent and purpose of the Action Plans and explain the requirements and process changes will occur in conformance with the obligations. He will provide monthly updates to keep staff abreast of any changes and updates.
3. HMSD Superintendents and Assistant Superintendents will distribute copies of the Action Plan to Heating Plant Technicians and HMSD Maintenance Workers in the December 2019 cluster weekly meetings, beginning December 5, 2019.

4. The General Manager will email the Action Plan to all Property Management staff.
5. The Director of HMSD will host two meetings with the Regional Asset Managers under the Vice Presidents of Operations to discuss the Action Plan and answer any questions. These meetings will be held the week of December 9, 2019.
6. Property Managers will distribute the Action Plan to development frontline staff during the daily morning muster.
7. Community Engagement & Partnerships (CEP) will meet with Tenant Association Presidents throughout January 2020 to discuss the Action Plan and answer any questions.
8. NYCHA will develop a mechanism for ongoing staff and resident feedback to refine and improve our service to residents, as indicated in the Evaluation and Improvement section of this plan. The plan includes:
 - Data analysis of the usage and accuracy of robocalls, MyNYCHA app, and other systems with which residents interact.
 - Resident feedback survey from a sample of residents who experienced an outage during the 2019/2020 heating season
 - CCC call taker survey
 - Resident workshops to collect qualitative feedback
 - Summary report of findings

B. Background

The New York City Housing Authority (NYCHA) owns and operates 172,447 apartments in 2,291 buildings across 311 developments. Under New York City Administrative Code § 27-2029, and as required in Obligation A.1 of the Agreement, NYCHA must maintain the following internal apartment temperatures between October 1 and May 31:

Time of Day	If temperature falls below	Required minimum internal temperature
6am-10pm	55°	68°
10pm-6am	ANY TEMP	62°

To ensure compliance with these standards, NYCHA maintains a vast heating operation—either directly or through a third party vendor—including 1,713 boilers, 1,492 vacuum tanks, and 847 instantaneous water heaters.¹ NYCHA's heating operation is managed by the Heating Management Services Department (HMSD), which employs 549 full-time staff as of October 31, 2019. The department's total FY19 budget is \$115 million.

Between the 2017/2018 and 2018/2019 heating season, key changes to HMSD operations enabled NYCHA to significantly improve heating service to residents. From the 2017/2018 to the 2018/2019 heating season, NYCHA reduced the total number of outages by 31% from 1,776 to 1,218.²

Relevant Obligations	
A.9	Starting with the Heating Season beginning October 1, 2019, NYCHA will:
A.9a	Consistent with its previously stated goal, restore heat to units affected by a heating shortage within an average of 12 hours.
A.9b	During the Heating Season, for 85% of heating shortfalls, NYCHA will restore heat to affected units within 24 hours, and in no event more than 48 hours. NYCHA may restore heat through the use of temporary replacement heating systems that comply with the N.Y.C. Admin. Code.

NYCHA's obligation for restoration time of heating shortages, under the Agreement, is 12 hours.³

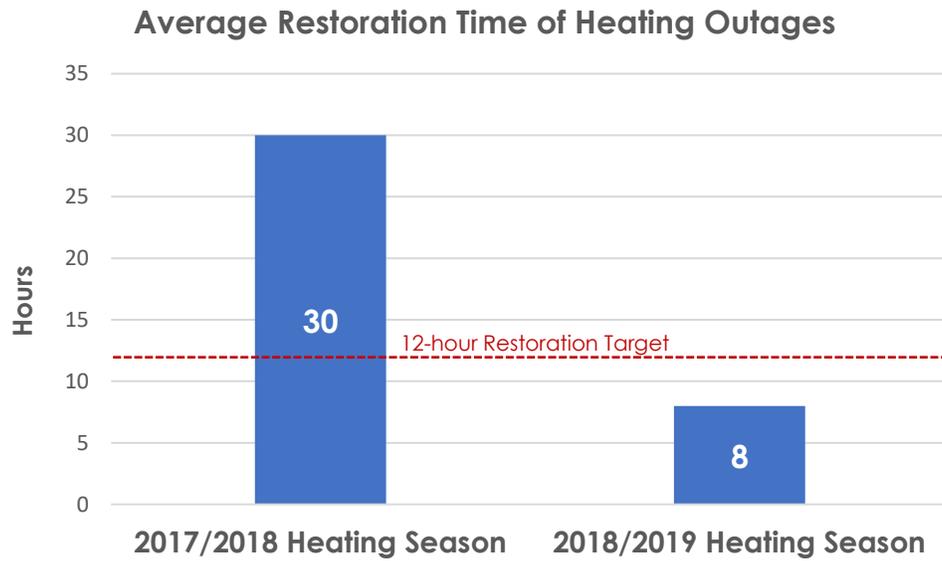
NYCHA reports that it has made some improvements with respect to large-scale heating outages in recent heating seasons. From the 2017/2018 to the 2018/2019 heating season, the average restoration time of outages was reduced from 30 hours down to 8 hours, a reduction of 73%.⁴ NYCHA's HMSD is committed to reducing last season's average outage time even more and will be providing relevant data throughout the course of the winter to HUD and the federal Monitor.

¹ Asset counts will change as NYCHA upgrades heating systems and disposes of properties through NYCHA's Permanent Affordability Commitment Together (PACT) program.

² Heating performance calculations have not yet been verified by the Monitor.

³ Heating performance calculations include planned and unplanned outages.

⁴ Heating performance calculations have not yet been verified by the Monitor.



5

The Agreement also requires that by October 1st, 2019, for 85% of heating shortfalls, NYCHA will restore heat to affected units within 24 hours, and in no event more than 48 hours. In the case of large-scale heating outages, NYCHA reports that in the 2018/2019 heating season, NYCHA met this requirement by resolving 96% of outages within 24 hours. Less than 1% of outages lasted longer than 48 hours.⁶

⁵ The 2017/2018 Heating Season ran from October 1, 2017 through May 31, 2018; The 2018/2019 Heating Season ran from October 1, 2018 through May 31, 2019.

⁶ Heating Performance calculations have not yet been verified by the Monitor.

C. Heat Outage Response⁷

When heating systems fail, causing disruptions in heat service to residents, HMSD must repair the equipment causing the failure as quickly as reasonably possible so that heat service can resume. Until the moment heat service is restored, HMSD staff at every level must work diligently to diagnose the problem, identify solutions, and deploy skilled trade staff and resources as needed. NYCHA staff provides residents with notification of outages in conformance with the Heating Standard Procedure⁸.

1. Responding to Heating Complaints

The Heating Superintendent, Assistant Superintendent, Property Maintenance Supervisor, Assistant Property Maintenance Supervisor and/or Property Manager are required to monitor Maximo at 8:00 a.m., 10:00 a.m., 12:00 p.m., and 3:00 p.m. during regular business hours to determine if there are any outstanding heating work orders. After business hours, the After-Hours Heat Desk is required to continuously monitor Maximo for heat complaints. HMSD staff inspects each conventional heating plant in assigned clusters, a minimum of once per week. They also inspect non-conventional heating plants, as assigned by the heating superintendent. Additionally they inspect tank rooms quarterly, or as directed by the heating superintendent.⁹ As of October 1, 2019, work orders for the daily inspection of boiler rooms are created in Maximo.

1. Upon receiving a heat complaint, the Customer Contact Center (CCC) customer service agent creates a service request in the Siebel system (the system used to support customer service) and informs the resident that staff will investigate and correct the condition. Siebel automatically transfers the service request information into Maximo which creates a Priority 7 emergency work order.
2. The CCC customer service agent receiving the complaint must verify the phone number of the resident.
3. HMSD will address the work order once it is created.
4. The HMSD Heat Desk staff uses BMS to ensure that the boiler plant is operating properly. For non-BMS sites, a Roving Team comprised of HMSD staff is required to be dispatched by the After-Hours Heat Desk.
5. The heating frontline staff investigating the complaint is required to complete all steps in the following order:
 - a. Note the outside temperature on the heat work order.
 - b. Check zone valve operation and the position of the zone valve in the tank room.

⁷ Standard Procedure 060:63:1, Heating and Domestic Hot Water was updated and distributed on September 30, 2019 and can be found in the attached appendix, together with a workflow of NYCHA's heating outage response procedure.

⁸ See Standard Procedure 060:63:1, page 44: Resident Communications

⁹ See Standard Procedure 060:63:1, page 25.

- c. While in the tank room, check the operation of the vacuum and/or condensate pump(s) to determine if there is adequate vacuum in the building and checks the bypass valve and the circulation pump.
- d. Note the actual conditions found in the tank room and the action taken on NYCHA Form 060.074, *Tank Room Log*.
- e. The following steps shall be taken regardless of whether Building Management Systems are installed in an apartment:
 - i. Visit the apartment and take ambient temperature readings in each room. Record the temperature and time of the reading on the work order and add photos of the temperatures taken to the work order. If the daytime temperature is 68°F or above, or the nighttime temperature is 62°F or above, there is no issue to resolve. It is recommended to still follow through with the remaining procedure.
 - ii. Check each radiator in the apartment and verify the valve is fully open.
 - iii. Check radiator steam trap for proper operation. If the trap is open and passing steam, replace the component.
 - iv. Check for heat in the risers, both supply and return. If there is no measurable heat in the risers, go to the apartment below and repeat the above steps.
 - v. Survey area around the radiator or convector. Make sure it is free from debris and there is no furniture blocking the unit.
 - vi. Check windows for any open or improperly closed windows, including broken windows and/or malfunctioning window balances.
 - vii. Look for air conditioners left in the windows causing outside air to enter the room.
 - viii. Report inoperable windows and drafty air conditioners to Property Management for follow up.
 - ix. Check if oven is being used for heat.
 - x. Check if space heaters are being used for heat.
 - xi. Document all findings on the work order.
 - xii. If the issue cannot be resolved in the apartment, advise the resident that work to resolve the issue will be completed as quickly as possible.
 - xiii. A work order is not closed if the apartment temperature is below legal limits.
 - xiv. Replace the thermostatic element, if required.
- f. If the tenant is not at home:
 - i. Leave NYCHA Form 040.534A, *Notice of Visit by NYCHA Staff*, under tenant's door.

- ii. Check the apartments directly above and below for a no-heat condition.
6. If the complaint cannot be resolved by the heating frontline staff during regular business hours, she or he notifies a HMSD supervisor, the property maintenance supervisor, or designee, and the HMSD or property management staff creates a child work order for Maintenance, Repair and Skilled Trades (MRST) staff or a vendor, if needed.
7. If the complaint cannot be resolved by the heating frontline staff after regular business hours, the After-Hours Heat Desk creates a child work order for MRST.
8. If a problem has been recognized in a particular tank room, a zone valve opening adjustment must be made.
 - a. For Building Management Systems sites, HMSD personnel must verify that the valve is operating automatically. If a condition is observed that precludes automatic operation and requires a manual adjustment via BMS or by-passing the BMS controls, the HMSD personnel shall:
 - i. Inform the heating administrator; and
 - ii. Open a work order to repair the condition that requires manual operation.
 - b. For non-BMS sites, the After-Hours Heat Desk dispatches a Roving Team to the location.
9. If there are multiple heat complaints made about the same underlying root cause:
 - a. During business hours, all associated work orders relating to a service disruption must be completed and closed by HMSD supervisory staff. Additionally, the property maintenance supervisor, or designee, must advise the residents and the Resident Association President via telephone notification of the resolution of the heat issue.
 - b. After business hours, all associated work orders relating to a major service disruption must be completed and closed by the After-Hours Heat Desk. Additionally, the After-Hours Heat Desk and Emergency Services Department supervisor, or designee, must advise the Resident Association President via telephone notification of the resolution of the heat issue.
10. The heating frontline staff records on each work order the amount of labor and materials expended.
11. The heating frontline staff, or Property Management staff if applicable, takes a photo of the posted notice and attaches it to the work order.
12. Once the asset is repaired, HMSD staff records temperatures in three apartments in the affected buildings, starting on the top floor and working their way down. If the resident is not home or does not grant entry, HMSD moves to the next apartment on the line—or elsewhere on the floor if it is a building-wide outage. An HMSD supervisor or Heat Desk staff records the cause, attaches photos of the temperature sensors showing the internal temperature, and closes the work order,

which triggers automated calls to affected residents, prompting each resident to verify that service has been restored.

2. Responding to Apartment Temperature Sensors

HMSD Personnel in locations with indoor temperature sensors shall:

1. Use BMS to ensure that the boiler plant is operating properly.
2. Check the apartment temperatures through BMS to confirm:
 - a. The average building temperature conforms to temperature set points and meets legal requirements of NYC Administrative Code Section 27-2029 (a)¹⁰; and
 - b. The temperature reported in the apartment that is the subject of the heat complaint, where available.

Any time the BMS records a temperature below the aforementioned temperature set point requirements, HMSD personnel shall:

1. Review Maximo for open work orders in the apartment.
2. If a work order has not been generated, call the resident to confirm that they have proper heat.
3. Schedule an apartment visit at the resident's convenience.
4. Upon arrival at the apartment, follow the process for unit inspections as outlined in Section XVI.B. of the NYCHA's Standard Procedure: Procedures for Heat Complaints.

3. Responding to Heating Plant Alarms

BMS has an alarm system established to notify NYCHA personnel of emergency situations at a heating plant.

Alarms for Building Management Systems-Enabled Heating Plants

Currently, there are three emergency conditions for which the Building Management Systems provides an alarm notification:

1. System Alarms (Steam or Hot Water Temperature), which depend on the type of boilers that are installed at a heating plant. The two system types are:
 - a. Steam System - An alarm is triggered if there is substantial pressure loss at the heating plant, as measured by the "Pressuretrol" sensor.

¹⁰ Between the hours of 6 a.m. and 10 p.m., if the outside temperature falls below 55 degrees, the inside temperature is required to be at least 68 degrees Fahrenheit; and, Between the hours of 10 p.m. and 6 a.m., the inside temperature is required to be at least 62 degrees Fahrenheit.

- b. Hydronic System - An alarm is triggered if there is substantial hot water temperature loss at the heating plant, as measured by the Aquastat sensor.
2. Electric (ASCO Relay) Alarms, triggered when there is an interruption or reduction of power in the heating plant, as indicated by the ASCO Relay.
3. Water Intrusion Alarms, triggered when there is a substantial increase in the water level on the heating room floor, as measured by a flood float sensor.

Building Management Systems E-mail Notifications

Each alarm type is configured to automatically send an e-mail after a predetermined period of time. The e-mails are sent to relevant HMSD Administrators, Superintendents, Assistant Superintendents, and the Emergency Services Department. The BMS alarm e-mail provides the following information:

- Time of the alarm
- Alarm Type
- Property Management Department/Cluster
- Heating Plant Location
- Web link to the BMS
- Order ID

Recording Alarm Responses by After-Hours Heat Desk

The After-Hours Heat Desk frontline staff who respond to an alarm must record all visits to development boiler rooms in the Boiler Room Logbook (in red ink) and on NYCHA Form 060.296, Heating Plant Service Area Nightly Report. The name and title of the supervisory staff member shall be recorded as well as the purpose of the visit.

4. Third Party Managed Sites

As of October 1, 2019, NYCHA has turned over the heating plant operations at 48 developments¹¹ to third party management. At these developments, vendors maintain heating equipment so that internal temperatures within apartments remain at or above the legal requirements of NYC Administrative Code Section 27-2029 (a). The vendors manage every aspect of the heating system that NYCHA would otherwise directly manage including performing preventative maintenance and restoring heat when outages occur. As is also the case at HMSD-managed sites, Property Management is responsible for performing daily inspections of the boiler room.

Unlike at HMSD-managed developments however, the Property Management Maintenance Worker (MW) at developments under third party heating management is required to respond, take apartment temperatures, and make minor repairs in the

¹¹ The full list of third party managed sites can be found in the attached Appendix.

apartment to heating radiators and/or valves. This change allows direct interaction with residents to remain with NYCHA staff as opposed to the third party heating staff, who will focus on the heating equipment in the boiler rooms and tank rooms. The general process for responding to heat complaints is as follows:

1. During regular business hours, if the heat and/or hot water complaint cannot be resolved by the MW, the MW shall contact their Property Management Superintendent (PMS) or Assistant Property Management Superintendent (APMS) to initiate follow-up communication with the third party and create a child work order and/or outage work order for the vendor. If additional NYCHA skilled trades are needed, the MW shall create child work orders for those trades. PMS/APMS and the third party will be in contact throughout the day to resolve heat issues, as needed.
2. If the resident is not at the affected unit, the MW will leave a Notice of Visit form under the door. The MW will visit the apartments above and below the affected unit to check if there are any signs of a system failure in the apartment line. The MW will record temperature findings on the work order. If the MW finds that there is no heat and/or hot water in any of the other units, the work order must be sequenced to third party staff by PMS/APMS for follow-up as a service outage may have occurred.
3. In the case of a service outage:
 - a. All work orders associated with the line, building, or development subject to the outage will cease to be the responsibility of the MW.
 - b. If the outage is identified in a boiler room or tank room, the third party staff will contact the PMS to have an outage work order created by the HMSD Heat Desk and the associated resident complaint work orders will be associated to the outage.
 - c. If the work orders created to address resident complaints or the MW's follow-up indicate a likely outage, the PMS or designee will contact the HMSD Heat Desk to create an outage work order and notify the third party for follow-up.
 - d. Once the outage has been resolved, the MW will sample impacted apartments to verify that service has been restored. The MW will record apartment temperature readings on the outage work order on their handheld device.
 - e. When service is restored, the MW will notify PMS/APMS, who will verify information entered on the work order and close it.

Even though vendors maintain the boiler rooms at these locations, the HMSD Heat Desk continues to monitor the BMS to ensure that equipment is fully functional. The Heat Desk also monitors any heat complaints and will dispatch a Heating Plant Technician (HPT) roving team to the location and contact the third party vendor if a high number of complaints indicate a potential outage.

5. Making Asset Repairs

A Point of Contact on the ground, typically a Heating Superintendent or Assistant Superintendent, either makes the repairs or coordinates with HPTs, Maintenance Workers, or other skilled trades and/or vendors to ensure that the repairs are completed within 12 hours, the required heat restoration time pursuant to the HUD Agreement. Though every outage condition requires a different set of solutions, HMSD has the following resources to facilitate quick repairs:

- **Spare Parts** - HMSD has satellite storerooms at strategic locations¹² with high demand parts available for emergency use. Equipment includes various sized steel braided hoses, OS&Y (“Outside Stem and Yoke”) valves, domestic water, high temperature hoses and 4 gauge quick connect cables for mobile boiler connections.
- **Support Equipment** – Emergency Services Department “ESD” and MRST have dewatering pumps, hail pumps, sewage vacuum trunks, and portable generators readily available for use by HMSD. Additionally, HMSD keeps temporary heat exchangers and steam regulators available at all times.
- **Non-HMSD Skilled Trades** – When an emergency outage occurs, HMSD will reach out to internal departments for execution of skilled trades work. Often this can include mobilizing plumbers, electricians, and other trades from other departments within Support Services and Property Management.
- **In-House Fabricators** – In order to perform quick repairs, MRST—a department made up of skilled trades staff that reports directly to the SVP of Support Services—has developed the internal capacity to fabricate parts on-site.

HMSD also utilizes **External Contractors** as an alternative to NYCHA skilled trades when the repair is highly complex and is likely to require multiple teams of plumbers and other skilled trades. These labor-only and labor/material contracts, which are managed by HMSD central office staff, help to preserve the limited capacity of NYCHA skilled trades. Though HMSD considers every outage to be an emergency, the external contracts are typically brought in to handle the complex and large-scale repairs and replacements after HMSD abates the emergency and restores service. The contracts can be specific to certain scopes (e.g. sump pump replacement), though many cover a wide range of heat equipment maintenance and repair issues.

To utilize a contract, the borough administrators or Deputy Directors will contact the vendor’s point of contact to schedule work, then hand off the daily coordination to a heating Superintendent or Assistant Superintendent who meets the vendor in-person at the site to review the scope and oversee the work.

In addition to the HMSD contracts, ESD has an emergency contract with Garner Environmental Services, Inc., a full service environmental company offering emergency

¹² Two Bridges, Unity, Gun Hill, Todt Hill, Pomonok, Throggs Neck

response for oil spills and hazardous materials, soil remediation, vacuum truck services, roll-off equipment rental and transportation, and disaster response for natural and man-made disasters. This contract is not frequently used by HMSD, but can be accessed in the event of a major City infrastructure failure such as a large electrical outage.

Gas Outages

When a gas outage occurs at the development, either because of issues from the supplier or from a failure in the gas supply equipment within the boiler room, NYCHA can switch the fuel source from gas to oil at certain locations. This option is only available at the dual-fuel burning sites with operational oil supply equipment. There are 192 developments that can switch from gas to oil in the event of a gas outage.

Though gas outages occur infrequently, HMSD will always switch to oil when that option is available to restore service immediately. HMSD stays in contact with Con Ed or National Grid during the gas outage.

Daily Heat Call

During the heating season, HMSD and Property Management conduct a daily Heat Call to discuss current outages, high ticket counts, no heat, no water, no hot water planned and unplanned service disruptions. The HMSD Director or a Deputy Director conducts the call, which includes all of the Property Management Regional Asset Managers, Directors, Vice Presidents, and the Executive Vice President (Property Management leadership may also have a representative call in), as well as NYCHA's Recovery & Resiliency Department. The call, which includes representatives from privately managed NYCHA developments, allows HMSD and Property Management to discuss problematic and complex heating-related issues.

Each call begins with a review of each outage on the public service disruption page.¹³ HMSD informs the relevant Property Management staff of the work being done to restore the outage. In some cases, HMSD will use the call to request assistance on issues outside of the boiler or tank room impacting the outage, as might be the case in a water main break, for example.

If an outage is at a privately managed site, the private property manager will discuss the work being done to resolve the outage. They may also use that time to elevate issues that require additional assistance from HMSD.

Once all of the outages on the service disruption page have been discussed, HMSD will review the Heating Dashboard for any developments experiencing high numbers of heat-related work orders. HMSD and Property Management discusses any known conditions at these sites. If there is an indication that there may be an equipment failure, HMSD will send an HPT be to the site to diagnose any potential issues.

¹³ <https://my.nycha.info/Outages/Outages.aspx>

6. Flooding

Conventional heat plant floods occur for a variety of reasons, including sewage stoppages, water main breaks, water line ruptures, condensate overflows, and groundwater intrusion. Electrical outages and surges can also cause sump pump failure.

In the event of a heat plant flood, the Heating Administrator shall take direct control of the emergency resolution. The first step after identifying the source of the flood water and entering a work ticket is to stop the flow of water at the source. Once the flow of the flood water has been controlled, dewatering of the affected area must begin. A damage and needs assessment commences once the water has been removed from the boiler plant. A thorough assessment is made of all electrical panels, operating controls, gas piping, gas valves, gas regulators and associated controls on each boiler's gas train. Flooding scenarios that cause total submersion of the plant normally result in all electrical components and controls needing replacement.

Once the assessment of damage is complete HMSD takes the necessary steps to restore the plant. These steps include collaboration with other departments on a variety of resource needs, such as:

- Procurement for material and contract needs
- Maintenance Repair & Skilled Trade for trade support
- Property Management for cleanup assistance and Carpenters
- Emergency Services Department for heavy equipment needs (dewatering pumps or generators)
- Technical Services Department for heavy vehicle operators (typically plumbers)
- Resident Engagement Department for resident outreach
- Department of Communication to handle media inquiries
- Intergovernmental to handle communications with elected officials and City Hall
- NYCHA OEM for interagency support

The emergency placement of a mobile boiler may be necessary and will depend on the severity of the flood and level of equipment damage. Additional information concerning mobile boilers can be found in the Long-Term Outage section below.

Sewage stoppages in boiler plant buildings must be prioritized for resolution to prevent critical damage to boiler plant equipment and controls. Upon notification of a sewage stoppage in a heating plant building, the Heating Supervisor must notify Property Management via email and phone call for immediate resolution.

Flood Prevention

All conventional boiler plants are equipped with a flood sensor. This flood sensor is tied into the Computerized Heating Automation System (CHAS). When water intrusion is

detected by the flood sensor, email notifications are sent to all HMSD Superintendents/Assistant Superintendents and the Emergency Services Department. The flood sensor must be tested once per month (first Tuesday of the month). Results must be logged by cluster supervisors. Heating Superintendents/Assistant Superintendents must also take immediate action to replace any defective flood sensor and/or initiate repair authorization to the automated notification system if warranted.

Boiler plant sump pumps must be inspected for proper operation daily by frontline HMSD Staff. The proper way to inspect sump pump operation is to fill the sump pit with water using a hose and verify proper discharge of water. Boiler plant sump pits must be checked and periodically cleaned as needed.

House pumps and sewage ejector pumps located in boiler plants shall be visually inspected daily by frontline heating staff, and any unusual conditions shall be immediately documented and reported to Property Managers for follow up and correction. House pump and sewage ejector pump piping ruptures are known to cause major flooding in boiler rooms where this equipment exist. As such, any visible defects on house pump supply and discharge piping must be corrected as soon as possible. By May 31, 2020, at the end of the 2019/2020 heating season, HMSD will include boiler plant house pump and sewage ejector pump inspections as part of the boiler room daily inspection conducted by HPTs, which is tracked in Maximo by inspection work orders.

Additionally, to minimize basement and stack stoppages, all Property Managers and Property Maintenance Supervisors at developments that had 20 or more stoppages between January 2018 through September 2019 are required to establish a Monthly Preventative Maintenance Schedule for sewer rodding of lines, which includes the use of enzymes.

DEP Coordination

NYCHA is working with DEP to analyze where City infrastructure may be contributing to instances of flooding within NYCHA buildings. As part of this process, HMSD, Property Management, and the Departments of Energy and Performance, Tracking & Analytics (PTAD) are identifying how to ensure that the Maximo work data accurately depict the flooding circumstances that affect the heating equipment. To ensure accurate data, HMSD always enters a work ticket when a flood is found.

7. Long-term Outages

Mobile Boilers

In the event of a major boiler room failure or where restoration of the plant is projected to take significantly longer than 24 hours, NYCHA uses mobile boilers to restore heat to the residents. As of October 1, 2019, NYCHA has 62 staged mobile boilers, 5 of which are in place as a precautionary measure at high-risk boiler rooms.¹⁴ The 62 locations also

¹⁴ Melrose, Sotomayor, Pomonok, Van Dyke, Rangel

include planned boiler replacement sites as well as Sandy sites.¹⁵ In addition to the stated boilers, NYCHA has four spare mobile boilers available for deployment during the upcoming heat season that are located at the Throggs Neck Houses development, as well as a mobile boiler rental contractor to support any additional mobile boiler needs.¹⁶

This is, however, a last resort since installing a mobile boiler can currently take upwards of 48 hours at NYCHA in ideal circumstances. NYCHA must begin the mobile boiler installation procedures immediately after the problem diagnosis indicates that the outage may last longer than 24 hours. To facilitate a quick installation, NYCHA must coordinate with City agencies to ensure that permitting and inspections do not hold up the process. The scope of work also requires coordination with Carpenters, Welders, Plumbers, Electricians, and Licensed Oil Burner Installers.

To reduce the time it takes to install a mobile boiler, and in doing so make it a more viable option for restoring heat service during an emergency, HMSD is surveying all of its developments with centralized steam boiler plants and creating a centralized catalog of required parts and important installation information.¹⁷ This data will help heating management in quickly dispatching staff and purchasing required materials in the event that mobile boiler is required. The surveys are scheduled to be completed by mid December 2019.

HMSD will also work with NYCHA's Financial Planning & Analysis department to have funds allocated to pre-install mobile boiler connection lines. The pre-installation set-up will consist of the following:

- Steam pipe that runs from the exterior wall of the boiler room to a newly welded isolation valve on the steam header.
- Water pipe that runs from the exterior wall to the main condensate tank.
- Electrical line that runs from the exterior wall to the electric meter room, where a dedicated emergency disconnect has also been installed.
- Scaffolding within the boiler room.

Once connection lines are pre-installed, NYCHA will only need to connect the mobile boiler, build exterior scaffolding, and run steam, water, and electrical lines to the exterior wall of the boiler room in order to finalize the installation, significantly reducing NYCHA's mobile boiler installation time. Depending on the size of the boiler, the mobile may have an on-board fuel oil tank. If not, NYCHA will also need to run fuel lines to the underground storage tank.¹⁸

¹⁵ A full list of mobile boiler locations can be found in the attached Appendix.

¹⁶ NYCHA is in the process of procuring 6 additional mobile boilers. One is scheduled to arrive by December 31, 2019 and the remaining 5 will arrive prior to the 2020/2021 Heating Season.

¹⁷ Data points will include: mobile boiler location, internal system horsepower, in-ground oil tank capacity, scaffolding size and staging, electrical feed location, building amperage/voltage, electrical materials needed, steam inlet access point, steam connection inlet diameter, welding requirements, plumbing materials needed, and make-up feed water access point.

¹⁸ NYCHA does not have the in-house capabilities to pull a fuel line.

If the mobile boiler is installed on the street or sidewalk, NYCHA will obtain permits from the NYC Department of Transportation. Additionally, the mobile must be registered and inspected by the Department of Buildings (DOB). NYCHA and DOB work closely on mobile boilers to ensure they are up and running as soon as feasible. DOB expedites NYCHA's permit application for mobile boilers, and allows NYCHA to proceed with installation as soon as the need is identified. DOB only requires that NYCHA submit a permit application consistent with the Building Code's emergency permitting processes within a certain timeframe. Typically, DOB requires that the mobile boiler is inspected in its holding location prior to being moved and again after it is installed. However, DOB allows NYCHA to bring the mobile boiler in prior to installation so that only the on-site inspection is required. The Deputy Mayor of Housing and Economic Development have also developed an emergency communication protocol between NYCHA and the relevant approval organizations should any other delays occur, which includes contact information for each agency lead.

Though heating oil is the preferred fuel source in an emergency since it allows for a faster installation process, mobile boilers that are expected to remain active for more than one year will be transferred to gas to provide:

- **Less oversight on the utility consumption.** Whereas oil usage requires a HPT to verify each delivery using a dipstick, gas can be monitored via meter.
- **Less maintenance in extreme cold weather.** In below freezing temperatures, oil lines and tanks require regular maintenance to keep from freezing.
- **A cleaner fuel source,** in line with the City's climate impact goals.

Alternative Heated Community Spaces

At the discretion of the General Manager, NYCHA will open the nearest senior or community center for use as an "alternative heated community spaces," when the following conditions are met:

- an outage is expected to last longer than 12 hours;¹⁹
- outside temperatures drop below freezing (32 degrees).

However, notwithstanding the discretion provided in the prior sentence, as required by the Agreement, "NYCHA will provide alternative heated community spaces for heating outages that are expected to last for a substantial duration."

¹⁹ NYCHA's Environmental Health and Safety Department will conduct a Root Cause Failure Analysis for all outages lasting longer than 12 hours.

NYCHA currently has 241 senior or community centers that can be used as alternative heated community spaces.²⁰

Most of these spaces are staffed with Department for the Aging (DFTA) or Department of Youth and Community Development (DYCD) program staff during the day and will not need additional NYCHA staff. However, if an outage occurs outside the normal operating hours of the center, NYCHA will provide CEP staff and/or utilize an existing security contract to assign a security guard to the alternative heated space. When this is the case, CEP will work with NYCHA Financial Planning & Analysis to request additional overtime. During the day, service providers may choose to suspend regular programming to accommodate NYCHA residents utilizing the space as an alternative heated community space.

In cases where the alternative heated community space is not located at the development, NYCHA will provide a shuttle service to and from activated alternative heated community space with either Metropolitan Transit Authority buses or 12-passenger vans owned by NYCHA.

Warming Centers

Warming Centers are NYCHA community or senior centers, operated by City-contracted providers, that are preemptively opened at the discretion of the General Manager in advance of extreme cold weather events, defined as the following:

- Snow greater than 6 inches
- High temperatures below 15° F for a 48-hour period
- A wind chill below 0° F
- Sustained winds of more than 40mph
- Ice storms and/or freezing rain

One warming center will be located in each borough for a total of five warming centers, which will remain open for the duration of the extreme cold weather event. NYCHA will work with its City Agency partners to identify and open the selected locations. The warming centers will be staffed by CEP staff and open to NYCHA residents between the hours of 8:00am – 10:00pm.

As is the case when NYCHA opens a warming center, NYCHA will provide shuttle service to and from warming centers with either Metropolitan Transit Authority buses or 12-passenger vans owned by NYCHA.

²⁰ To assist with the planning of alternative heated space activation, NYCHA identified the nearest senior and community center locations for every NYCHA development, which can be found in the Appendix. Additionally, NYCHA Office of Emergency Management and PTAD are able to identify nearby potential alternative heating community spaces using interactive mapping tools.

8. Individual Action Plans

NYCHA is in the process of compiling information related to heat outage response for every development, beginning with the top 20 worst performing developments, as measured by the number of outages in the 2018/2019 Heating Season²¹.

Development	TDS	2018/2019 Heat Outages
BARUCH	060	78
SOTOMAYOR HOUSES	067	66
WHITMAN	514	38
INDEPENDENCE	140	30
CLAREMONT PARKWAY-FRANKLIN AVENUE	334	28
PELHAM PARKWAY	039	28
WAGNER	074	23
INGERSOLL	014	23
CLAREMONT REHAB (GROUP 4)	335	22
WILLIAMSBURG	002	21
SOUTH BRONX AREA (SITE 402)	305	18
JEFFERSON	064	17
TAPSCOTT STREET REHAB	354	17
RIIS	018	16
WASHINGTON	062	13
MARSHALL PLAZA	344	13
WSUR (BROWNSTONES)	178	13
GRAVESEND	068	12
TWIN PARKS EAST (SITE 9)	287	12
SAINT MARY'S PARK	093	12

Each Individual Development Action Plan will contain relevant information about the development including demographic data, heating system type and performance, and recent and upcoming heating-related work. The plans will also include a detailed breakdown of the specific requirements for a mobile boiler installation at each boiler plant as well as the nearest potential alternative heated community spaces. Each plan will also contain a map of the development that identifies:

- Potential alternative heated community spaces
- Underground steam lines
- Boiler plants
- Mobile boiler locations

The plans will be posted on the MyNYCHA Developments portal,[1] a section of NYCHA's website where residents already go to access data about their development such as

²¹ The Monitor has not yet verified the outage numbers stated in the below table.

[1] <https://my.nycha.info/DevPortal/>

work order trends, social services, and emergency preparedness. The first 20 plans will be posted on December 2nd, 2019. All remaining Individual Action Plans will be completed and uploaded to the portal by January 31, 2020.

D. Resident Communication

9. Outage Notification

Relevant Obligations	
A.13	<ul style="list-style-type: none"> a. Within two hours of NYCHA learning of any unplanned heating outage, NYCHA shall notify all affected tenants by robocall. NYCHA shall also post notice of the outage within the common areas of the affected building and on NYCHA's website. b. For any planned heating shortfall, NYCHA will provide affected tenants with at least 48 hours' advanced notice. Such notice will be provided via robocall, and shall be posted in the common areas of the affected building and on NYCHA's website. c. NYCHA shall give the Monitor 48 hours' advanced notice of any planned heating shortfall, and shall notify the Monitor within 2 hours of receiving notice of any unplanned heating shortfall. The notice shall be provided in the manner prescribed by the Monitor.

When planned work will impact heat service, NYCHA shall provide both posted notices in the lobby of affected buildings as well as automated calls²² to impacted residents 48 hours in advance of the scheduled outage. Residents then receive an automated call on the morning of the outage as a reminder of the planned interruption in service. Unplanned outages shall trigger notification robo-calls to all impacted residents at the beginning of an outage and when service is restored. HMSD also posts notices in the lobby of affected buildings for all unplanned outages. Beginning November 2019, HMSD began attaching pictures of the posted notices to the outage work order.²³

Beginning in January 2020, MyNYCHA app upgrades will be made to allow residents to opt-in to receive push notifications via the app regarding real-time heating service disruptions.

NYCHA also will publish all ongoing planned and unplanned heating outages on the Residents section of the NYCHA website in the Service Interruptions Overview.²⁴ The report includes current heating outages, those restored within the last 24 hours, and upcoming outages, along with the number of buildings, units, and residents impacted by each.

Relevant Obligations	
A.3	Within 90 days of the Effective Date of this Agreement, for those developments which are already furnished with electronic temperature

²² Residents can update personal information such as phone numbers via the Customer Contact Center (CCC). Additionally, the CCC records any new numbers used to call into the Customer Contact Center and updates personal information accordingly.

²³ HMSD keeps a record of all outage robocalls. During the 2018/2019 Heating Season, NYCHA made 508,604 robocalls, 323,729 of which connected, resulting in a connection rate of 64 percent.

²⁴ <https://my.nycha.info/Outages/Outages.aspx>

	reading devices, NYCHA will institute and maintain a system that identifies all apartments in which such devices indicate a violation of the City Code heating requirements, and identifies the inside and outside temperatures associated with such violation.
A.6	An appropriate mechanism for disclosing this information to the public shall be provided in an Action Plan.

Furthermore, as required in the Agreement, NYCHA must publish data from apartment temperature sensors. Residents and the public now have access to that data through NYCHA's Transparency webpage.²⁵ The report contains detailed information on the buildings that currently have apartment temperature sensors installed, including the average building temperature and any instances where sensors have recorded a temperature below City legal limits.

10. Tenant Association and Elected Official Outreach

When a heat outage occurs, Property Management is the first point of contact to the Tenant Association (TA). During after hours, between 4:30pm – 8:00am, Emergency Services Department (ESD) is responsible for contacting Tenant Association presidents. Tenant Association Presidents can also call Property Management or ESD directly. In instances where Property Management or ESD can not reach the TA or there's a challenging dynamic with elected officials, Community Engagement and Partnerships (CEP) and NYCHA's Intergovernmental Affairs Department will contact TA's and/or elected officials.

11. Resident Data Collection

NYCHA modified the triaged questions that a resident must answer when submitting a heat complaint through the Customer Contact Center (CCC) or the MyNYCHA app. The questions now include the following, with additional follow-up for each:

1. Is your apartment temperature too hot or too cold?
2. Is there no heat in the entire apartment or just one room?
3. Are the risers warm?
4. Are the radiators warm?
5. Are the radiators blocked by curtains or a piece of furniture?
6. Are your windows closing properly?

The modified triage questions produce a more accurate diagnosis, enabling NYCHA to allocate the right staff to address heating related problems.

NYCHA also developed an Interactive Voice Response (IVR) feature that allows residents to provide feedback when they receive an automated call notifying them that their heat

²⁵ <https://www1.nyc.gov/site/nycha/about/reports.page>

service has been restored. This enhancement allows residents to:

- Press “1” if they are still experiencing an interruption in service. By pressing “1”, the resident is automatically connected to the Customer Contact Center and their call is flagged as a follow-up to a heat outage.
- Press “2” if their service has been restored. By pressing “2”, the system logs the response that their service was successfully restored.
- If they hang up or do not answer their lack of response will be tallied.

The new feature acts as a verification of when heat is restored as well as a mechanism to immediately respond to circumstances where a heat outage has not been resolved. The plan to test the efficacy of the resident data collection during outages is outlined in the Evaluation and Improvement section.

12. Resident Not Home

Pursuant to obligation A.8 of the Agreement, NYCHA must also address work order close-out policies when the resident is not available at home or otherwise does not provide access to his or her apartment to resolve a heating outage. When a work order is created it is HMSD's policy is to visit the tank room first (as required on all heat related work orders), ensure equipment is functional, then visit the apartment associated with the work order. If the resident is not home or does not provide access, the HPT will leave the Notice of Visit form under the tenant's door and the HPT will check the apartments above and below on the same apartment line to confirm whether heat is present. If a heating outage is confirmed, all associated work orders will be correlated with the outage in Maximo and closed out when heat is restored.

If the outage is being caused by a condition within an apartment, HMSD works with Property Management to use right of entry to enter the apartment, according to policies set forth within the right of entry standard operating procedure.²⁶

13. Alternate Heated Community Spaces and Warming Centers

To communicate the opening of alternate heated community spaces and warming centers, NYCHA posts flyers at developments, reaches out to resident leaders with materials to be distributed, and ensures that Property Managers have all the information on hand to provide residents with information on how to access these locations. When a warming center is activated, NYCHA Intergov contacts elected officials representing the affected residents. NYCHA Office of Emergency Management and Department of Communications also coordinate with the City to have information posted on the City's emergency response websites and communicates with residents via social media. Below is a twitter post sent on January 21st 2019 in advance of an extreme cold weather event:

²⁶ The Right of Entry Standard Operation Procedure (SP) can be found in the Appendix.



Warming centers are open across the City for residents experiencing issues. Please use the MyNYCHA app or call the CCC at 718-707-7771 to report any heat or hot water problems.

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In preparation for the freezing temperatures, NYCHA has activated warming centers in all five boroughs.

Borough	Center	Development	Address
Bronx	BronxWorks	Saint Mary's Park	595 Trinity Avenue
Brooklyn	Brooklyn Bureau Community Services	Carey Gardens	2315 Surf Avenue
Brooklyn	University Settlement Society of New York, Inc.	Ingersoll	177 Myrtle St.
Brooklyn	El Puente de Williamsburg	Taylor-Wythe	80 Clymer St.
Brooklyn	NYCHA	Brownsville Senior Center	528 Mother Gaston Blvd
Manhattan	Graham-Windham Services To Families & Children	Manhattanville	530 West 133rd Street
Manhattan	Grand Street Settlement, Inc.	Rutgers	200 Madison Street
Manhattan	Union Settlement	White Community Center	237 E 104 th Street
Queens	Action Center of Education and Community Development, Inc.	Hammel	81-14 Rockaway Beach Blvd.
Queens	NYCHA	Bland Senior Center	40-21 College Point Blvd
Staten Island	Jewish Community Center of Staten Island, Inc.	Carter (Gerard Carter/Stapleton)	230 Broad Street

14. Additional Protocols for Vulnerable Residents

In addition to the communication plan for all residents listed above, NYCHA will conduct supplemental outreach during an outage to senior and mobility-impaired residents who were not reached by the automated robocall.

By October 1, 2020, NYCHA will have established procedures in place to:

1. Identify the vulnerable residents who were not reached by the automated robocall, using existing data from the Tenant Data System and IVR records
2. Call the subset of unreached vulnerable residents
3. Conduct in-person visits to any residents that are not reached by phone call.
4. Leave information regarding the outage and any additional provisions, including alternative heated spaces, under the door at the apartments of any residents who do not answer the door.

E. Evaluation and Improvement

15. QA Root Investigation Plan

Relevant Obligations	
A.9c	In any event in which heat is unable to be restored to a particular unit within 12 hours, appropriate NYCHA personnel distinct from the NYCHA personnel responsible for the heat restoration, as identified in an Action Plan, shall undertake an investigation to determine the root cause(s) of such initial failure of the heating system and the failure to achieve the restoration of service within the timeframe, identify corrections to prevent or lessen the recurrence of such failures, and track the implementation of such corrective actions. Such information shall be retained in a central repository to which all applicable maintenance staff and management have access.

In any event in which heat is not restored to a unit within 12 hours²⁷, personnel assigned to NYCHA's Environmental Health and Safety ("EHS") Department, will conduct a Root Cause Failure Analysis "RCFA" to determine the root cause(s) of the service failure. While the Agreement does not assign this function to a specific department until October 1, 2024 (when it is assigned to the Quality Assurance Unit "QAU"), it is apparent that the core functions of EHS, specifically "analyzing, overseeing, and improving environmental health and safety at NYCHA, which shall include.....heating.."28, align with this requirement.

In addition to a thorough report of the cause of the outage condition, each RCFA will include corrective actions that, when implemented, will endeavor to prevent or lessen the recurrence of such failures. Corrective actions may include recommendations to repair or replace certain assets as well as changes to NYCHA's heating outage response procedures. Within the EHS Department, the RCFA will be conducted by personnel assigned to the Heating Oversight Team, who are experienced in assessing and inspecting heating delivery systems.²⁹

To conduct a RCFA, the EHS Department will utilize the following steps:³⁰

²⁷ During the 2018-19 Heating Season, as determined by NYCHA, there were 139 such occurrences.

²⁸ HUD Agreement, page 13, paragraph 55(a).

²⁹ The EHS team tasked with these duties, the Heating Oversight Team, is separate and distinct from the EHS teams providing oversight into the other areas of the Agreement. The six (6) oversight specialists assigned to this team will prioritize the failure investigations over other duties within the team's scope of responsibility. Two specialists have already been hired and the remaining four will be hired by February 2020. Additionally, when necessary, the EHS team will engage QA inspectors from the Quality Assurance Department in these investigations.

³⁰ A step-by-step breakdown of the RCFA can be found in the appendix.

- A. *Information Collection* - This step covers the measures necessary to identify and collect the information required to perform an analysis of the failure. The initial action will be to form the "RCFA Team" consisting of members of the EHS Heating Oversight Team and external personnel, predominantly members of NYCHA's Operations team, to participate in the RCFA. This is necessary to ensure those that have ownership of the failure are involved in the analysis of the problem and that the corrective actions within the RCFA have operational legitimacy. Once formed, the RCFA Team will define and develop the problem statement, which will assist the RCFA Team determine which data and evidence is required to conduct the analysis. It is anticipated that as the RCFA process matures and common categories of outages and associated evidence are clearly defined, the time spent on this phase of the process will be minimal.
- B. *Analysis* - Upon receiving the defined data and evidence, the RCFA Team will begin the analysis phase of the RCFA process. Using common RCFA techniques to arrive at the root cause(s) of a failure, the RCFA Team will adhere to the following guidelines during this phase of the analysis:
- a. The intent of this process is to determine and correct the failed process, not to assign blame.
 - b. The evidence reviewed, not intuition, biases, or prior interactions, will define the root cause(s) of the failure.
 - c. Identify the multiple decisions made prior to the failure event; the key is to identify which had the greatest impact on the failure.
- C. The analysis phase will be considered complete once the root cause(s) has been identified. The RCFA Team will then progress to the "solution" phase of the RCFA which they will develop and submit to the SVP Operations Support Services for review. Upon receipt of the report, the SVP Operations Support Services will provide feedback to the analysis and corrective actions, which the RCFA team will incorporate into a "RCFA Findings and Corrective Actions Report". This report will identify the root cause(s) of the failure and direct that the Heating Department, and any other Department that had a contributing role in the root cause(s) identified, take the defined corrective actions by a date certain, to prevent occurrences of this type. The reports will also be retained in a central repository to which all applicable maintenance staff and management will have access, as required in the Agreement.

The EHS Department will receive quarterly status reports, from the SVP Operations Support Services, which will track the implementation of such corrective actions in a manner that make allow affected personnel to access.

While NYCHA is confident that the skill sets and numbers of personnel assigned to these investigations will be sufficient to deliver the required results, upon completion of this initial heating season, the EHS and QA Departments will re-evaluate staffing and budgets required to meet this obligation and modify as appropriate.

By October 2024, QA will assume control of the RCFA for all outages lasting longer 12 hours. NYCHA will also explore outsourcing the root cause analysis to a third-party contractor.

16. Predictive Analytics

Relevant Obligations	
A.12	A failure to timely restore heat will not constitute a violation of paragraphs 9 and 10 if the failure is caused by forces outside of NYCHA's control other than the weather, if NYCHA establishes to the satisfaction of the Monitor that they were the cause of the failure and that such cause was outside NYCHA's control. Nothing in this paragraph affects the provision in paragraph 11.

The primary performance indicator that NYCHA uses to develop the replacement pipeline for boilers and other heating assets is number of outages. In combination with HMSD's knowledge from the field, this indicator is useful for elevating the developments that need immediate intervention.

Outage quantity as a metric can show which developments have poor performing heating systems, but it does not help identify or diagnose failing assets.³¹ And, while HMSD records the cause for each outage, the data are not validated and often fail to properly show the root cause of the outage.

Given these challenges, NYCHA is making changes to how data is recorded to more accurately link performance indicators—outage quantity as well as others—to specific assets. By October 1, 2020, the start of the 2020/2021 heating season, HMSD will make the following changes in order to (a) leverage historic data to predict asset failures and (b) develop a data-supported equipment replacement pipeline:

- **Verify all heating assets in Maximo** – HMSD uploaded all of NYCHA's boilers into Maximo, but the data requires verification. Once completed, NYCHA's boiler assets will be accurately reflected in Maximo, and there will be a clear process for ensuring that asset information is revised as boiler rooms undergo capital replacement and modernization.
- **Revise Cause Codes** – When an outage is closed, the HMSD Superintendent, Assistant Superintendent, or Heat Desk staff assigns a cause code to the work order to indicate the root cause of the outage. The codes need to be revised to better reflect the typical root causes, including any instances where the failure is caused by forces outside of NYCHA's control, since these outages would not constitute a violation of the Agreement.
- **Upgrade field staff handheld equipment** – The current handhelds are a barrier to properly recording outage details. NYCHA will upgrade the handhelds and train on the new equipment.

³¹ For heating outages, HMSD uses a general problem code in Maximo: "NoHeat".

- **Develop a work order QA program** – The regular check on outage work orders will ensure outages are opened and closed properly, which is critical to being able to run descriptive statistics reports.
- **Create a “Zone” outage** – Currently, a single recorded outage can be for an apartment line, stairhall, building, or entire development. However, heat distribution is set up in such a way that a failure in one building can cause service disruptions in multiple others. When this is the case, NYCHA records each individual building as separate outages. The “zone” outage will ensure that NYCHA is not counting a single outage event more than once.

These changes will go into effect by the 2020/2021 heating season, which begins on October 1st, 2020.

17. Resident Communications Evaluation

In January of 2019, NYCHA began using an Interactive Voice Response (IVR) automated telephony system to communicate with and gather information from residents during heat outages. Now, when a heat outage occurs, impacted residents receive automated “robocalls” indicating that there has been a disruption in heat service. For planned outages, NYCHA sends robocalls 48 hours in advance.

When heat service is restored and the outage work ticket is “closed,” residents receive an automated call notifying them that their heat service has been restored and a series of prompts wherein the resident can inform NYCHA if they are still experiencing a disruption in heat service. During the 2018/2019 heating season, NYCHA attempted 311,517 heat restoration robocalls with the following results:

Restoration Call Breakdown	# of Calls
Calls Attempted	311,517
Calls Answered	170,231
<i>Service Not Restored</i>	15,669
<i>Serviced Restored</i>	154,562
<i>Indicated by selecting "1"</i>	108,044
<i>Abandoned or did not make selection</i>	46,518

NYCHA has also made significant improvements to the process for collecting resident data on outages, including modifying the triaged questions that a resident must answer when submitting a heat complaint through the Customer Contact Center (CCC) or the MyNYCHA app in order to produce a more accurate diagnosis, enabling NYCHA to allocate the right staff to address heating related problems.

While these new communication systems have greatly improved NYCHA's ability to provide safe and comfortable indoor temperatures, the system has yet to be used for a

full heating season. Therefore, following the 2019/2020 heating season on May 31st, 2020, NYCHA will conduct an evaluation of these IT systems—CCC, MyNYCHA, and IVR. The evaluation will include:

1. Data analysis of the usage and accuracy of each resident touchpoint
2. Resident feedback survey from a sample of residents who experienced an outage during the 2019/2020 heating season
3. CCC call taker survey
4. Resident workshop to collect qualitative feedback
5. Summary report of findings

The final report with recommendations will be submitted to the Chair and General Manager by the third quarter 2020 or 9/30/2020.

F. Operations Infrastructure for Heating Outage Response

18. Heating Management Services Department³²

The HMSD is responsible for management and repair of boiler plants, tank rooms, and ancillary equipment. HMSD has a staff of 549 employees,³³ and utilizes federal operating dollars and City funding to maintain NYCHA's building heating systems, from the boiler plants to the heat distribution pipes to the apartment radiators.

The majority of HMSD's frontline staff are organized into geographical clusters. There are 13 clusters: three in the Bronx, four in Brooklyn, three in Manhattan, one in Staten Island, and two in Queens. Four Administrators oversee the boroughs. Each cluster is overseen by a Superintendent and Assistant Superintendent who are responsible for dispatching their HPTs and MWs throughout the developments within their cluster—usually between 5-10 developments per cluster. The superintendents also share plumbers and plumber's helpers with other superintendents within their borough.

HMSD also has seven Central Office staff, which includes the Director of HMSD, as well as more skilled special teams that work on mobile boiler installations and a range of changing, often compliance-related, projects across the entire portfolio. The special teams also include 21 plumbers/plumbers helpers that work across the entire portfolio, rather than reporting to specific boroughs.

As of October 31, 2019, the staff head count is as follows:

Clusters	Bronx	Manhattan	Brooklyn	Queens/SI	Central/Special Teams	Total
Titles	3	3	4	3	N/A	13
Central Office	0	0	0	0	7	7
Administrator	1	1	1	1	2	6
Plumber/Plumber's Helper	0	0	0	0	21	21
Oiler/Oil Burner Specialist	2	3	0	2	4	11
Super./Asst. Super.	7	6	9	5	7	34
Heating Plant Technician	81	89	122	36	6	334
Maintenance Worker	25	38	43	25	5	136
Total	116	137	175	69	52	549

In the 2017/2018 heating season, 70% of resident complaints for heat occurred outside of the traditional 8:30am-4:30pm shift. To meet these needs, HMSD shifted resources and implemented a **24/7 coverage shift model**.

³² An Organizational Chart of HMSD can be found in the appendix.

³³ As of October 31, 2019

HMSD now has staff assigned to specific sites from 5am to 10pm daily. HMSD also has assigned evening and overnight Roving Teams from 4pm through 8am the following day.

With the supply of resources now properly aligned with the maintenance need, NYCHA is better suited to diagnose and fix asset failures quickly, resulting in a lower overall average restoration time of outages.

24/7 Heat Desk

Relevant Obligations	
A.14a	By March 31, 2019, NYCHA will create a 24/7 Heat Desk which will monitor heating metrics and dispatch staff to correct deficiencies during the Heating Season

Year round, for twenty-four hours a day, seven days a week, the HMSD Heat Desk is now responsible for tracking, monitoring and reporting all heat service disruptions using the Heating Dashboard and data from heat sensors in the Computerized Heating Automation System (CHAS). During the day, the Heat Desk is staffed by Central Office staff from the Office of the Director of HMSD. At night, the Heat Desk is staffed by four supervisors (3 Superintendents and 1 Assistant Superintendent) and three dispatchers. Heat Desk staff are in contact with frontline staff throughout the day and report up to HMSD and Executive staff every two hours.

Operations Heating Dashboard

Relevant Obligations	
A.3	Within 90 days of the Effective Date of this Agreement, for those developments which are already furnished with electronic temperature reading devices, NYCHA will institute and maintain a system that identifies all apartments in which such devices indicate a violation of the City Code heating requirements, and identifies the inside and outside temperatures associated with such violation.
A.4	This information will be available to all NYCHA personnel responsible for heating and to all development managers.
A.5	This information will be fully available to the Monitor, HUD, and SDNY.

NYCHA updated the Operations Heating Dashboard for the 2018-2019 Heating Season to leverage predictive trends and provide a more comprehensive view of the operation of the heat systems with updated data³⁴ to the Heat Desk so they can dispatch accordingly. These updates streamline data that is currently available on the individual work order level or via manually compiled reports, across multiple data systems. The updated dashboard includes the following data sets in a single location:

³⁴ There is a 15-minute delay on the data provided to the Heat Dashboard.

- **Detailed open outage report**, with the capability of being broken down by Property Management Regional Asset Manager, heating cluster, consolidation, or development
- **Boiler out of order report**, with relevant asset information such as make, model, and any open work orders associated with the boiler.
- **CHAS monitoring**, including boiler room monitoring and failure alarms
- **Outage trend report**, broken out by cause/repair codes and restoration time.
- **Open work orders**, with the capability of being broken down by heating cluster, consolidation, or development
- **Work order trend report**, including summaries by development or heating cluster, repair time, and work completed.
- **Electronic temperature reading devices**, including any that are registering temperatures below legal limits.

In advance of the 2019/2020 heating season, HMSD used the Heating Dashboard to identify the top 20 developments with the most outages during the previous heating season. These developments were prioritized to receive Individual Action Plans, as indicated in Section C: Heat Outage Response.

Real-time data from electronic temperature reading devices have been made available to NYCHA personnel responsible for heating and all development managers and to the Monitor, HUD, and SDNY via the heating dashboard.

Building Management Systems

Relevant Obligations	
A.7	By December 31, 2020, NYCHA will have installed electronic temperature monitoring sufficient to provide NYCHA a comprehensive understanding of heating conditions in 44 developments, which shall include electronic temperature monitoring in no fewer than 30% of NYCHA apartments in such developments. A schedule shall be established in an Action Plan with deadlines by which NYCHA will install such monitoring systems in the remainder of NYCHA's developments.

Building Management Systems (BMS) enable remote monitoring and automation for building infrastructure such as heating systems. They provide a critical source of data for HMSD staff in managing outages.

CHAS is currently installed in 206 boiler rooms, which supply 185 developments. These locations account for the large conventional campus-style locations. Unfortunately, CHAS is an outdated system with antiquated technology, proprietary hardware and software, and limited boiler room alerts.

Using financing from Energy Performance Contracts (EPC), NYCHA is installing a new BMS. The HUD Agreement requires NYCHA to install apartment temperature sensors and new BMS at 44 developments by December 31, 2020.³⁵ BMS/temperature sensor projects are currently underway at a total of 58 developments,³⁶ 39 of which have planned completions by December 31, 2019. In addition to being a non-proprietary system that opens NYCHA up to the wider BMS industry, the new BMS will provide NYCHA with critical asset monitoring, including, but not limited to:

- Boiler plant, tank room, and hot water generating equipment failures
- Steam pressure and other distribution factors at various points in the system
- Water, gas, and electricity status;

The BMS also has sophisticated data analysis capability, so that data coming in from the various monitoring points can influence decision making. The BMS is being configured to create automatic work orders in Maximo (the system that tracks all work orders for NYCHA), as well as provide real-time status information for the 24/7 Heat Desk.

Of NYCHA's 306 developments, 23% will have temperature sensors by 2020. Of the remaining developments, 155 will receive new BMS and temperature sensors through heating systems upgrades or EPCs. Ninety-three are slated for RAD/PACT and will receive temperature sensors as part of the RAD/PACT construction scope of work. NYCHA has already amended the RFP language to reflect this requirement. Thirty-two developments will receive sensors as part of planned comprehensive modernizations. The remaining developments are small buildings that do not have central plants. NYCHA will develop a program to provide monitoring-only temperature sensors in these remaining developments.

	Number of Developments	2020 or earlier	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	N/A
Central Steam Plant Developments	155	69	0	0	22	33	21	7	3	0	0	0	
RAD / PACT	93		27	7	12	5	1	3	22	10	1	5	
Comprehensive Mododernization	32						2		1				29
Scattered Sites (Non central plant)	26					26							
<i>Total by year</i>	306	69	27	7	34	64	24	10	26	10	1	5	29
<i>Cumulative % Completed</i>		23%	31%	34%	45%	66%	74%	77%	85%	89%	89%	91%	100%

³⁵ A list of the 44 developments with planned start and completion dates can be found in the appendix.

³⁶ The 58 sites receiving new BMS are from three Energy Performance Contracts and were selected based on various criteria including location (i.e. within geographical energy usage areas designated by Con Ed) and financial feasibility. One of the EPCs is made up of the Sandy FEMA sites.

19. Office of Emergency Management

NYCHA's Office of Emergency Management (OEM) is charged with creating the framework within which NYCHA reduces vulnerability to hazards and copes with disasters. OEM has a wide scope, encompassing NYCHA's response to emergencies ranging from natural disasters to infrastructure failures. OEM manages NYCHA's Comprehensive Emergency Management Plan (CEMP)³⁷, a part of which covers heating-related emergencies during the winter months, as well as the Incident Command System (ICS) structure of how incidents are escalated.

Though NYCHA considers every heating outage an emergency, OEM will become involved in emergency management in advance of extreme cold weather events when the following conditions are met:

- Snow greater than 6 inches
- Temperatures below 15° F for a 48-hour period
- A wind chill below 0° F
- Sustained winds of more than 40mph
- Ice storms and/or freezing rain

At the discretion of the General Manager, OEM will activate the Situation Room and Warming Centers during these extreme cold weather events. NYCHA will also adapt these procedures over time to facilitate faster and more robust emergency response during heating outages.

Situation Room and Field Coordinators

In the Situation Room, an actual central "war room" located at the Long Island City NYCHA facility and outfitted with computers, OEM oversees coordination of emergency response with various NYCHA departments. The Situation Room is activated for 24/7 coverage and includes representatives from: OEM; Property Management; HMSD; Maintenance, Repair & Skilled Trades; Emergency Services Department; Technical Services Department; Elevator Service and Repair Department; Department of Communications; Procurement; and the Capital Projects Division.

OEM has also hired twelve field coordinators on a 6-month pilot program to assist with coordinating efforts at an emergency incident that may take place on NYCHA property. Their main functions will be as an on-the-ground point of contact for OEM, assisting with managing logistical requests and aiding in interdepartmental and interagency communication and collaboration.

³⁷ An overview of the CEMP can be found in the Appendix.

20. Stakeholder Engagement

Clear resident engagement is key to the provision of safe and comfortable indoor temperatures. To ensure robust communication with residents, HMSD relies on partnerships with Property Management, Intergovernmental Affairs, CEP and Partnerships, and the Department of Communications.

Property Management

Property Management are the frontline staff that run the operations of the developments. They are also the first line of communication for residents. In the event of an outages, Property Management is a key resource of information for residents.

Community Engagement & Partnerships

The CEP engages and connects NYCHA residents to critical programs and services. CEP supports NYCHA's extensive network of Resident Associations and manages partnerships, programs and initiatives in the areas of economic opportunity, youth, senior and social services.

Intergovernmental Affairs

NYCHA's Office of Intergovernmental Relations (known as "Intergov") acts as a liaison between the Authority and elected officials at all levels (city, state, and federal). The Intergov team works with elected officials to craft legislation, organize capital funding, and make sure their constituents have safe, clean, and connected homes. During emergency situations, Intergov will be in contact with local elected officials with the most up-to-date information.

Department of Communications

NYCHA's Department of Communications develops and disseminates NYCHA's messaging to multiple audiences including residents, employees, community partners, media, and the general public through numerous communication channels.