

Committee(s):	Date:
Markets	19 July 2017
Subject: Smithfield Market – Condenser Water Cooling System - Update	Public
Report of: The City Surveyor (Report no. CS291/17)	For Information
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Summary

This update report brings Members up to date with recent developments on Smithfield Market's refrigeration condenser water cooling system.

Work to replace East and West Market condenser water pumps is progressing well and should be complete by mid-July 2017. The new pumps will give greater flow and reliability and provide re-assurance to the Markets Department and Tenants.

The system operating temperature currently remains set at 23⁰C but will be raised, in stages, back to 25⁰C, once the pump replacement is complete. In the recent hot weather, the temperature has risen to 26.5⁰C, which has caused difficulties for two fridges. Under their original specifications, all fridges should be capable of working with water at 28.5-30⁰C.

A failure of the condenser water supply occurred on 2 June 2017, caused by a split rubber flexible bellows on one of the City's original East Market pumps. This was quickly repaired by the Market's Maintenance Team, minimising operational impact. No claims for spoiled product have been received.

Recommendation(s)

Members are invited to note the contents of this report.

Main Report

Background

1. The Market's condenser water cooling system removes waste heat from 120 tenants' refrigeration units in East, West and Poultry Markets and dissipates it to the atmosphere via five cooling towers located in the Poultry Market. The system is operated and maintained by the City Corporation as Landlord.
2. In 2014 the City Corporation completed a programme of works to improve the water circulation in the three Market buildings and remove dirt contamination in the system. As a result performance has significantly improved.
3. The cooling system was originally specified to provide water to Tenants' fridges at 30°C. Over the years this was gradually reduced and for approximately five years has been set at 20°C. This was done to assist fridges at a time when there were issues with water flow, dirt contamination, system balancing, and Tenants' condenser under-sizing.
4. Earlier this year the City carried out a trial to check the effects on fridges of operation at up to 25°C. In response to comments from the Smithfield Market Tenants' Association, the operating temperature has been left at 23°C since 4 April 2017 pending completion of the City's pump replacement project under the City's Cyclical Works Programme.

Current Position

5. The cooling system operating temperature has remained at 23°C since 4 April 2017. In recent hot weather, as in previous years, the City's cooling towers are unable to maintain this supply temperature, which has risen up to 26.5°C. Information from the Tenants' Association indicated that two fridges belonging to P J Martinelli Ltd tripped overnight on 21 June on one of the hottest days. There has been little practical operational impact reported on other fridges, and no claims for spoilt meat have been received. Under their original specifications, all fridges should be capable of working with water at 28.5-30°C.
6. The City's pump replacement project is progressing well and new condenser water pumps and control panels for West Market have been in operation since 13 June 2017 (*see photo below*). The new pair of pumps are larger and replace original pumps which had failed more than once, so should give a more reliable service to Tenants in the future.
7. At the moment they provide about 10-15% more flow than previously with the capability to give about 25% more when running at maximum speed. Before increasing the flow further, the City is monitoring Tenants' pipework for two-three weeks for leakage, as the water pressure is increased by about 0.5 bar at fridge deck level. Two minor leaks have already been found and repaired.
8. The new East Market pumps should be in operation from 7 July 2017, with full completion of all other work in the contract by 31 July 2017.



New condenser water pumps and control panels - West Market

Incidents since last report

9. At 7pm on 2 June 2017 there was a serious failure of the condenser water supply caused by the splitting of a flexible rubber bellows on the discharge outlet of one of the East Market condenser water pumps. Fridges tripped and the Market Maintenance Team and fridge contractors were called out, eventually restoring the service just after midnight. This swift action mitigated the effect of the failure and no claims for spoilt product have been received.
10. The flow to West Market was disrupted over the following 24 hours which was rectified by cleaning out the main duplex filters. It is assumed the previous day's problems in East Market may have dislodged static dirt in the system which had collected in the filters.
11. It is believed the rubber bellows had probably weakened with age. The pump replacement works include the replacement of all flexible bellows with new.
12. There were also two less serious interruptions to the West Market flow on 9 and 22 June due to oversights by the controls sub-contractor working on the pump replacement. The City will seek to recover the call-out costs from this contractor. The City has stressed again to the main contractor and sub-contractor it is essential to avoid disrupting the condenser water flow.

Investigation into refrigerant gas releases

13. The inspection of Tenants' records related to use and release of refrigerant gases by the Superintendent and Principal Engineer is expected to take place in July.

Proposals

14. Once the pumps have been replaced and monitored for a period, it is intended to raise the system operating temperature, in stages, back to 25°C, re-measure fridge and water supply conditions, check correct operation of Tenants' equipment, and review any on-going issues.
15. The City will encourage Tenants to replace any fridge condensers considered undersized and any faulty water control valves.
16. The City will contact Tenants' maintenance contractors to review their maintenance records.

Corporate & Strategic Implications

17. The system supports the meat trade at Smithfield Market and the following Strategic Aims:
 - To provide modern, efficient and high quality local services and policing within the Square Mile for workers, residents and visitors with a view to delivering sustainable outcomes.
 - To provide valued services to London and the nation.

Implications

18. The cooling system operated by the City provides a critical service for Tenants' refrigeration equipment. A failure of the system could potentially expose the City to claims from Tenants for loss of product.
19. The new East and West Market condenser water pumps entering service will give greater flow and reliability and provide re-assurance to the Markets Department and Tenants.

Conclusion

20. Work to replace East and West Market condenser water pumps is progressing well and should be complete by mid-July 2017. The new pumps will give greater flow and reliability and provide re-assurance to the Markets Department and Tenants.

Background Papers

Report of the City Surveyor 'Smithfield Market – Condenser Water Cooling System – update' to Markets Committee, May 2017 (Report ref. CS193/17).

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