STOP WASTING POWER

ELECTRICAL DIAGNOSTIC INVESTIGATION REPORT

Measured engineering evidence for a modern city-centre extended-stay apartment hotel

ANONYMISED SAMPLE REPORT Commercial property | United Kingdom

Investigation

Independent Electrical Diagnostic Survey

Prepared by

Stop Wasting Power

REPORT REFERENCE	SURVEY DATE	STATUS
SWP-EDS-023	March 2023	Final report

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CONFIDENTIALITY Client identity and identifying property information have been removed. The measured evidence, engineering assessment and recommendations remain representative of the investigation.

Document control

Field	Details
Client	Private client
Building type	Modern city-centre extended-stay apartment hotel
Location	United Kingdom
Investigation	Independent Electrical Diagnostic Survey
Survey date	March 2023
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Survey scope

Assessment of principal engineering systems, electrical distribution, plant-room operation, air-conditioning systems, guest accommodation and a proposed voltage optimisation system.

ENGINEERING APPROACH Measure. Analyse. Investigate. Recommend. Decisions are based on measured electrical evidence supported by physical inspection and discussions with the hotel engineering team.

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1. Executive summary

OVERALL CONCLUSION The hotel's principal engineering systems were generally operating to a high standard. The measured evidence did not support investment in voltage optimisation. A separate operational fault within one air-conditioning section was, however, consuming approximately 7 kW continuously while delivering little or no useful cooling.

Headline findings

Area	Measured finding	Commercial conclusion
Plant room	Demand varied naturally and reduced overnight	Operating as expected
Guest accommodation	Demand followed occupancy and appliance use	Operating as expected
Kitchen	Low overnight demand; clear breakfast and daytime response	Operating as expected
Reception / public areas	Demand reduced overnight and increased with activity	Operating as expected
Voltage optimisation	Modern electronically controlled loads; satisfactory power factor	Capital investment not recommended
Air conditioning	Approximately 7 kW almost continuously	Engineering attention required

Primary recommendations

- Do not proceed with the proposed voltage optimisation installation.
- Isolate the affected fan or fans associated with the failed condenser until repairs are complete.
- Repair or replace the failed condenser.
- Recommission the air-conditioning section and confirm that demand again varies with cooling demand.

ESTIMATED AVOIDABLE OPERATING COST Approximately £11,000-£17,000 per annum for the affected air-conditioning section.

2. Background, scope and methodology

2.1 Purpose

Stop Wasting Power was commissioned following proposals to install a Voltage Optimisation system. Before committing to the capital expenditure, the client requested an independent assessment of whether voltage optimisation represented the most effective way to reduce electricity costs, or whether greater benefit could be obtained from the performance and control of existing systems.

2.2 Investigation stages

Stage	Purpose
Measure	Monitor representative systems during occupied and low-occupancy periods.
Analyse	Compare measured profiles with the expected behaviour of correctly controlled services.
Investigate	Use site inspection and discussions to establish the likely cause of abnormal behaviour.
Recommend	Provide evidence-based engineering recommendations.

2.3 Monitored areas

Representative distribution boards serving the plant room, guest accommodation, kitchen, reception and public areas, and air-conditioning systems. Demand, current, voltage and power factor were recorded over several days.

MEASUREMENT BEFORE INVESTMENT An electricity bill identifies total consumption. Monitoring individual distribution boards shows which systems are responsible and whether their operation reflects genuine demand.

3. Initial engineering assessment

The initial inspection identified a modern electrical installation and generally well-maintained engineering services. Major plant appeared to be in good condition, and Variable Speed Drives were incorporated into a number of principal systems. There was little visual evidence of neglected equipment or systems operating beyond their intended service life.

The monitoring programme was therefore used to verify that measured performance was consistent with these observations and to investigate the operational issue reported within part of the air-conditioning installation.

4. Plant-room electrical analysis

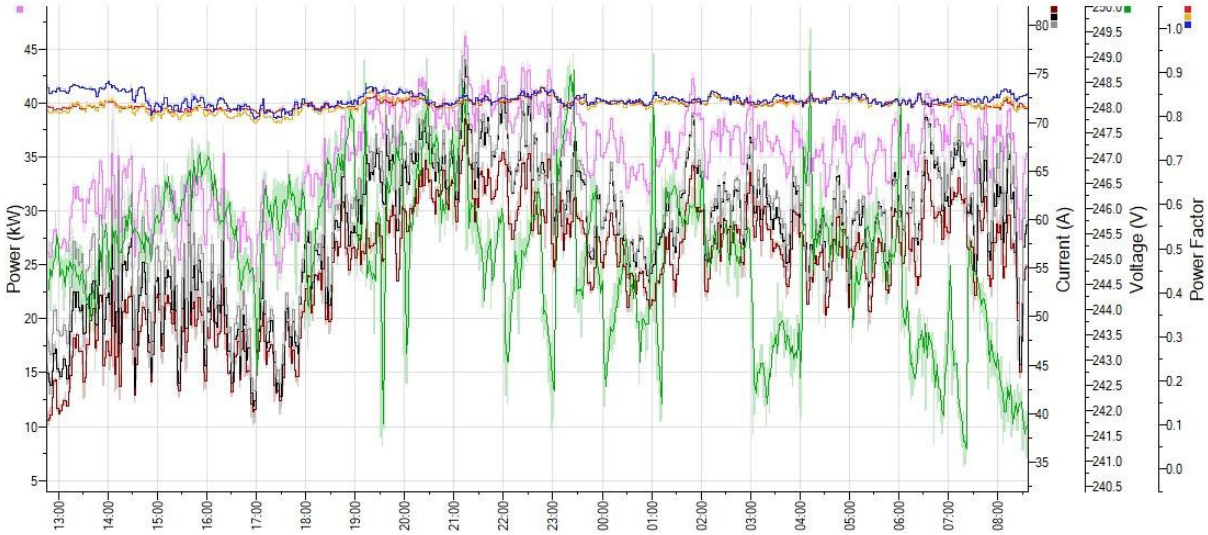

Figure 1 - Basement plant-room electrical profile. Estimated annual carbon: 76.26 tonnes.

Engineering assessment

Demand varied continually, reducing overnight before increasing with building activity. No prolonged fixed load was identified. Power factor remained generally stable and the supply voltage showed no significant abnormality. The profile is consistent with properly controlled plant responding to operational demand.

ENGINEERING CONCLUSION Status: Operating as expected. Recommendation: No corrective action is recommended.

5. Guest accommodation distribution boards

Representative guest accommodation boards were monitored to determine whether electrical demand reflected normal occupancy and appliance usage.

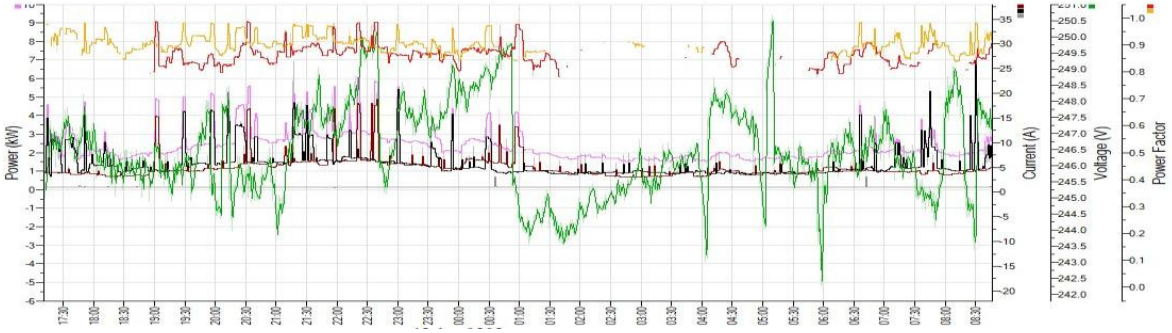

Figure 2 - Representative ten-room distribution board, Floor 8. Estimated annual carbon: 5.23 tonnes.

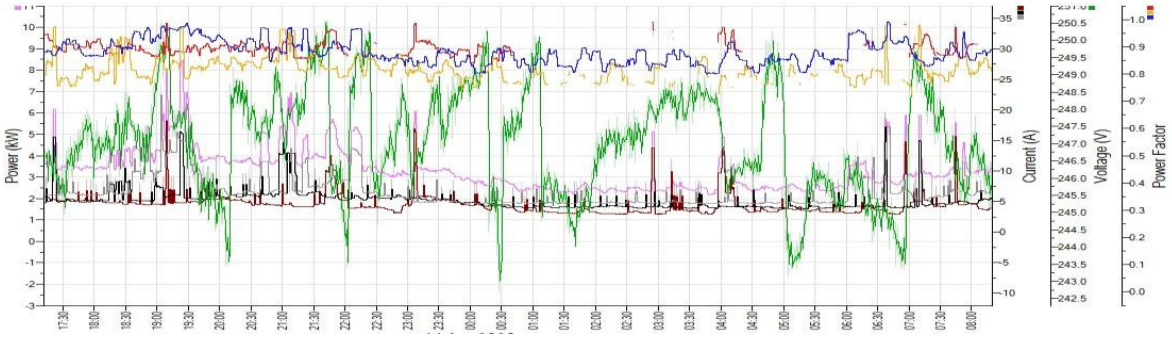

Figure 3 - Representative ten-room distribution board, Floor 6. Estimated annual carbon: 7.38 tonnes.

Engineering assessment

Demand reduced significantly during periods of low occupancy and increased naturally as guest activity resumed. This pattern was consistent across the representative floors, despite permanently connected refrigeration and cooking appliances in each suite.

ENGINEERING CONCLUSION Status: Operating as expected. Recommendation: No corrective action is recommended.

6. Kitchen electrical analysis

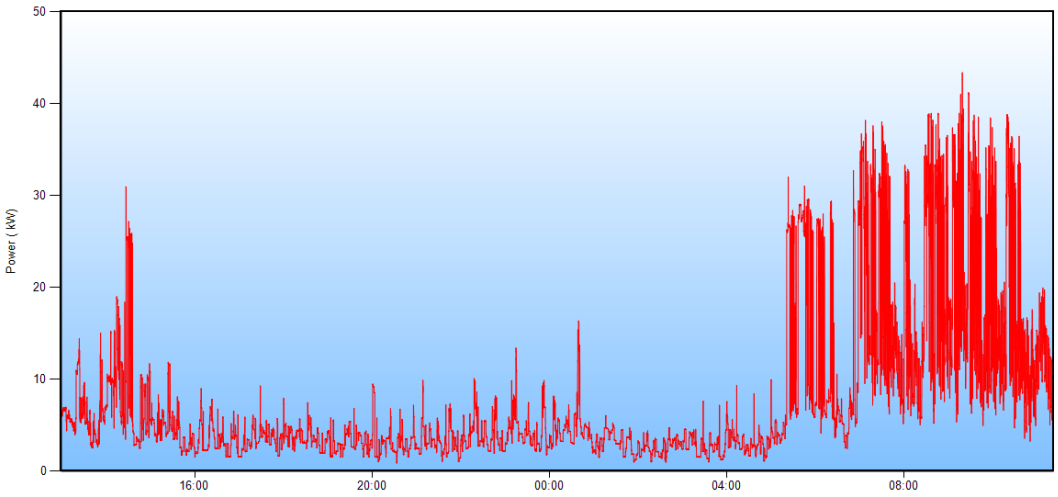

Figure 4 - Kitchen distribution-board electrical profile.

The low overnight demand, marked increase during breakfast preparation and variable daytime load are consistent with normal commercial-kitchen operation. No significant uncontrolled base load or unnecessary continuous operation was identified.

ENGINEERING CONCLUSION Status: Operating as expected. Recommendation: No corrective action is recommended.

7. Reception and public areas

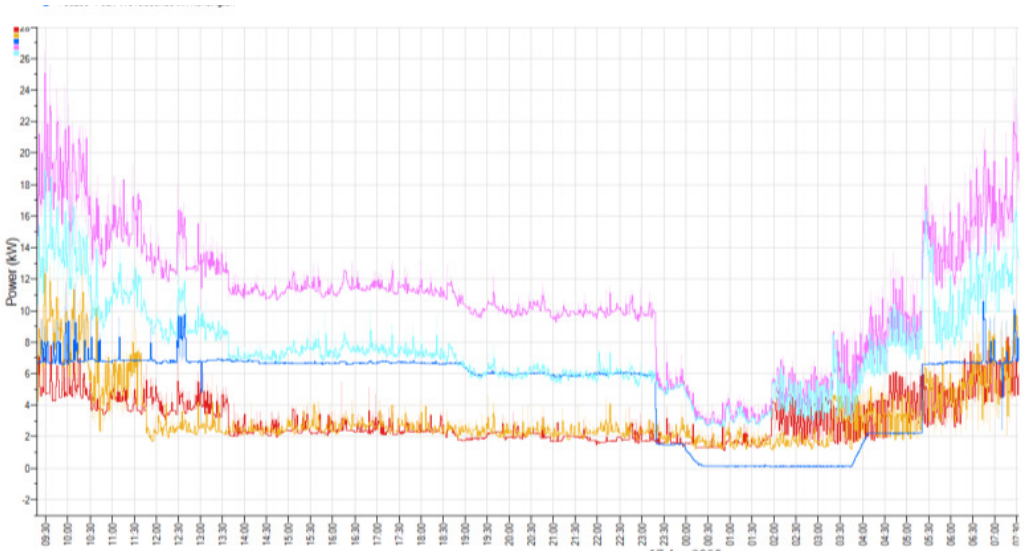

Figure 5 - Reception and public-areas electrical profile.

Demand reduced clearly overnight and increased gradually from early morning as reception, lighting and associated public-area services returned to normal operation.

ENGINEERING CONCLUSION Status: Operating as expected. Recommendation: No corrective action is recommended.

8. Voltage optimisation assessment

8.1 Technical context

Voltage Optimisation reduces incoming supply voltage. It may reduce consumption where a building contains significant voltage-dependent loads, including older lighting, resistive heating and certain fixed-speed motors.

This hotel contains many electronically controlled loads: inverter-driven refrigeration and air-conditioning, Variable Speed Drives, switch-mode power supplies and modern LED lighting. Such equipment is designed to maintain the required output across a range of supply voltages and therefore offers less opportunity for savings from voltage reduction alone.

8.2 Measured evidence

Evidence	Assessment
Plant room, guest areas, kitchen and reception	Demand varied naturally with operational requirements.
Power factor	Generally satisfactory; no significant improvement opportunity identified.
Connected load characteristics	Predominantly modern electronically controlled equipment.
Installation implications	Substantial alterations to the existing electrical distribution infrastructure would be required.

8.3 Commercial assessment

The expected project cost would be driven largely by electrical installation works rather than the voltage optimisation equipment itself. In view of the building's measured characteristics, connected equipment and the scale of the required works, the anticipated return was unlikely to justify the capital expenditure.

ENGINEERING CONCLUSION Status: Capital investment not recommended. On the measured evidence, Stop Wasting Power cannot recommend installation of the proposed Voltage Optimisation system.

9. Air-conditioning system investigation

Every other monitored distribution board showed demand changing with operational activity. The air-conditioning distribution board did not.

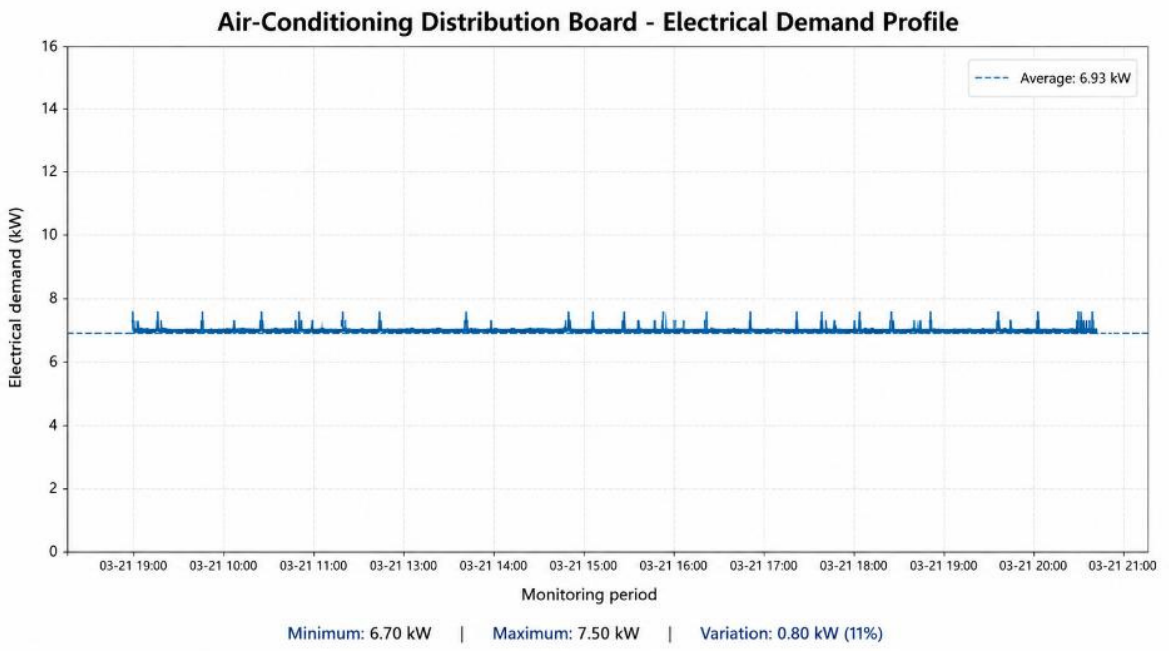

Figure 6 - Air-conditioning distribution-board profile showing an almost constant load close to 7 kW.

9.1 What the graph shows

The recorded demand remained almost constant throughout the monitoring period, with only minor variation despite changes in occupancy, ambient conditions and expected cooling demand.

9.2 Engineering assessment

The maintenance team advised that an associated condenser had failed and was awaiting repair. The profile is consistent with a fan continuing to operate in response to an unmet cooling demand. Because the setpoint could not be satisfied, the fan continued circulating unconditioned air while consuming electrical power but delivering little or no useful cooling.

MEASURED DIAGNOSIS One air-conditioning section continued consuming approximately 7 kW while delivering little or no useful cooling.

9.3 Engineering conclusion and action

STATUS: ENGINEERING ATTENTION REQUIRED The monitored profile is inconsistent with a correctly functioning air-conditioning system. The measured evidence and information obtained during the site inspection point to continued fan operation associated with a failed condenser.

Measure	Finding
Continuous electrical demand	Approximately 7 kW
Useful service delivered	Little or no useful cooling
Estimated annual operating cost	Approximately £11,000-£17,000
Required response	Isolate, repair, recommission and verify

Recommendations

- Isolate the affected fan or fans associated with the failed condenser to prevent further unnecessary consumption.
- Complete the planned repair or replacement of the failed condenser.
- Recommission the affected system and verify that electrical demand again varies with changing cooling demand.

WHY THIS MATTERS A normal electricity bill would show the consumption but not identify why it occurred. The contrast between this almost-flat load and the naturally varying profiles elsewhere in the hotel exposed the fault.

10. Cost, carbon and action plan

Priority	Area	Action	Financial position	Status
1	Air conditioning	Isolate affected fan(s); repair condenser; recommission and verify	Avoidable operation estimated at £11,000-£17,000 annually	Urgent
2	Voltage optimisation	Do not proceed with proposed installation	Avoid unjustified capital expenditure	Do not invest
No action	Plant room	Normal maintenance	No significant uncontrolled load identified	Operating correctly
No action	Guest accommodation	Normal maintenance	Demand responds to occupancy	Operating correctly
No action	Kitchen	Normal maintenance	No significant uncontrolled base load	Operating correctly
No action	Reception / public areas	Normal maintenance	Demand reduces during low activity	Operating correctly

Carbon context

The source report records estimated annual carbon of 76.26 tonnes for the basement plant room, 5.23 tonnes for the representative Floor 8 room board and 7.38 tonnes for the representative Floor 6 room board. These figures describe monitored operational demand and are not presented as savings.

COMMERCIAL PRIORITY Correct the measured operational fault first. Do not commit capital to voltage optimisation where the measured characteristics do not support the investment.

11. Measurement and verification

Following repair and recommissioning, repeat electrical monitoring should confirm that the affected air-conditioning demand varies in response to changing cooling requirements rather than remaining close to 7 kW continuously.

Action	Verification evidence
Isolate affected fan(s)	Immediate reduction in unnecessary continuous demand
Repair or replace condenser	Cooling function restored
Recommission controls	Demand varies with cooling requirement and setpoint
Repeat electrical monitoring	Post-repair profile no longer remains almost flat at approximately 7 kW

12. Overall engineering conclusion

The investigation showed that the majority of the hotel's electrical systems were operating efficiently and responding appropriately to changing demand. The plant room, guest accommodation, kitchen and reception boards provided consistent evidence of effective automatic control.

The proposed Voltage Optimisation system was not supported by the measured characteristics of the building, the nature of its modern connected loads or the substantial installation works required.

The air-conditioning profile was the decisive exception. Its almost constant 7 kW demand, considered alongside the failed condenser reported by the maintenance team, revealed a system consuming electricity while providing little or no useful cooling.

FINAL POSITION Do not proceed with voltage optimisation. Correct the air-conditioning fault, recommission the system and verify the result through further measurement.

Appendix A - Representative monitoring evidence

The principal charts reproduced in this report are taken from the supplied Kensington survey report and represent the electrical monitoring used for the engineering assessment.

Figure	Monitored area	Key characteristic	Assessment
1	Basement plant room	Variable demand; overnight reduction	Operating as expected
2-3	Guest accommodation	Demand responds to occupancy	Operating as expected
4	Kitchen	Low overnight load; breakfast and daytime response	Operating as expected
5	Reception / public areas	Overnight reduction; morning increase	Operating as expected
6	Air conditioning	Almost constant demand close to 7 kW	Engineering attention required

Source note

This redesigned report preserves the findings, figures, charts and recommendations contained in the supplied Electrical Diagnostic Survey example report (SWP-EDS-023). Its presentation has been updated to match the clearer evidence-led structure of the current Stop Wasting Power report style.

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