EXECUTIVE SUMMARY · PAGE 1 OF 2

Condition of the MEP and fire systems, and what to spend in the next three years

Every system was rated on site, given a remaining-life estimate and one recommended action, and placed in the year that action should happen. Life safety first, then guest comfort, then efficiency. Efficiency comes third in priority, not in value.

8	3	2	7
Systems rated on site, 1 to 5	Red flags, listed on page 2	Immediate items, ahead of Year 1	CapEx lines over three years, each with its basis and contingency

1 The building

Type	Business hotel, Riyadh, open and trading throughout the survey
Storeys	Basement plant, ground and L1 podium, 11 guest floors (L2–L12), roof plant: G+12
Rooms	176 keys, 16 per floor on L2–L12
Cooling	3 air-cooled chillers of about 350 TR on the roof; 2 heat-recovery fresh-air units; 4-pipe fan coils
Basement plant (B1)	LV switchboard, 1,250 kVA standby generator through an automatic transfer switch, fire pumps, booster set, tanks
Fire safety	Electric, diesel and jockey pumps; sprinkler and standpipe risers in both stairs; addressable alarm with voice evacuation

2 Scope and method

- Every plant room and riser walked; a sample of guest rooms on every floor, sold last on the survey days
- Functional tests witnessed with the hotel's chief engineer: generator changeover, fire pump runs, alarm zones
- Thermal imaging of the LV switchboard and floor distribution boards
- 12 months of electricity bills from the Saudi Electricity Company (SEC), water bills, maintenance records and the drawings available
- Non-intrusive: what sits above ceilings and inside risers is reported as unverified, and priced as a provisional quantity where it can be counted or a named provisional sum where it can't yet be defined

OVERALL FINDING

The building can keep trading. One life-safety system needs replacing now; fan coils and the generator transfer switch follow in Year 1, and the chillers in the winter of Year 2, one unit at a time.

3 Condition by system

EXAMPLE · 1 FAILED, 2 POOR, 3 FAIR, 4 GOOD, 5 AS NEW

SYSTEM	RATING 1–5	REMAINING LIFE	RECOMMENDED ACTION	WHEN
Fire alarm and detection Life safety	1	None left	Replace panel and detectors to current Civil Defense requirements	Immediate
Guest room fan coils HVAC	2	1 to 2 years	Replace floor by floor, aligned with the room refurbishment	Year 1
Standby generator Power	3	Engine 8+ years; transfer switch now	Replace the ATS, then a load bank test every year	Year 1
Chillers HVAC · sheet S-04	2	2 to 3 years	Replace one unit at a time between November and March	Year 2
Hot water plant Water	2	About 2 years	Replace calorifiers and rebalance hot water circulation	Year 2
Fire pumps and sprinklers Life safety	3	Pumps 5+ years	Replace the jockey pump and every painted head	Year 2
Fresh air handling units HVAC	3	4 to 6 years with new coils	Replace coils and fit EC fans	Year 3
LV switchboard Power	4	10+ years	Monitor: fix the hot joint now as maintenance (IA-01) and keep yearly thermal imaging. Outside the three-year CapEx plan; the lifecycle plan (CT-24) looks five years ahead	Monitor

SPECIMEN · illustrative hotel

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Example only

EXECUTIVE SUMMARY · PAGE 2 OF 2

4 Red flags and immediate items

Listed separately and ahead of Year 1, so they can be acted on now or used in a price negotiation.

REF	FINDING	WHY IT MATTERS	ACTION AND TIMING
RF-01	**Fire alarm panel discontinued; spares hard to find. Detector coverage has gaps after past room refits.**	Compliance (The Saudi Fire Protection Code, SBC 801; Civil Defense). A finding at the next inspection puts the renewal of the Salamah safety licence at risk.	Immediate: replace panel and detectors (C-01)
RF-02	**Chiller compressors well past their expected life; the refrigerant is being phased out.**	Cost exposure. A failure in July is a guest-comfort crisis, and refrigerant top-ups get harder to source each year.	Year 2, winter swap window; capacity confirmed by logging first (C-04)
RF-03	**Generator transfer switch failed to change over on one of three tests.**	Continuity. On a Saudi Electricity Company (SEC) supply outage, emergency power to lifts, fire pumps and escape lighting depends on it.	Year 1: replace the ATS, then load bank test yearly (C-03)
IA-01	**One hot joint on the LV switchboard, found on thermal imaging.**	Risk of an outage or fire at the main board.	Reported to the chief engineer the same day; re-scan after tightening
IA-02	**Fire alarm replacement (RF-01) carried as an immediate item.**	Ordered ahead of the Year 1 budget, with the Civil Defense approval of the new layout first.	Now; FLS drawings stamped by a licensed office

5 Three-year CapEx at a glance EXAMPLE · VALUE BANDS

IMMEDIATE · RED FLAG
- ▮▮ Fire alarm and detection

YEAR 1 · 2 ITEMS
- ▮▮▮ Guest room fan coils
- ▮ Generator transfer switch

YEAR 2 · 3 ITEMS
- ▮▮▮ Chillers
- ▮ Hot water plant
- ▮ Fire pumps and sprinklers

YEAR 3 · 1 ITEM
- ▮▮ Fresh air handling units

Value band (example): ▮ under SAR 0.5m · ▮▮ SAR 0.5–2m · ▮▮▮ over SAR 2m. Monitored, outside the three-year plan: LV switchboard (hot joint IA-01 fixed as maintenance; the lifecycle plan, CT-24, looks five years ahead). Each line, with its basis and contingency, is on sheet 3.

6 Energy and utilities

Baseline: 12 months of electricity bills (SEC) and water bills, as kWh and m³ per occupied room-night, adjusted for cooling degree-days and occupied room-nights. Cooling is the largest controllable cost in a Riyadh hotel.

LINE THAT SAVES ENERGY	KWH · SAR A YEAR	SIMPLE PAYBACK
C-02 fan coils with EC fans	from your bills	years
C-04 chillers: chiller-only kW/TR vs the maker's curve at the logged ambient	from your bills	years
C-07 FAHU coils and EC fans	from your bills	years

Values are left out of this specimen. Your report states each saving with its basis; after installation it is measured again and compared against a baseline adjusted for cooling degree-days and occupied room-nights (IPMVP).

7 What we recommend next

01 Approve the fire alarm replacement now and submit the new layout to Civil Defense.

02 Put the fan coils and the transfer switch in the Year 1 budget; phase the fan coils with the room refurbishment so each floor comes off sale once.

03 Before the chillers are ordered, log the plant through a hot month to confirm whether two units carry the load.

04 Review this report yearly (CT-24) and move lines between years as conditions change.

Prepared · our MEP engineer

Reviewed · the hotel's chief engineer

Received · owner or asset manager

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THREE-YEAR CAPEX PLAN · ISSUED WITH THIS REPORT AS CT-02

Every line with an estimate, its basis and a contingency

Each line is traceable to a system, a rating and a photo. Estimates are shown here as value bands; your plan carries the SAR estimate, the contingency as a percentage and the effect of waiting.

Red **Life safety and compliance** · C-01

Amber **Failure risk and guest impact** · C-02 … C-06

Green **Efficiency that pays back** · C-07

LINE	SCOPE	ESTIMATE (VALUE BAND)	BASIS	CONTINGENCY · WHY	IF IT WAITS
IMMEDIATE · RED FLAG					
C-01	**Fire alarm and detection** New panel and detectors to current Civil Defense requirements; coverage re-checked room by room	▮▮ 0.5–2m	Quotation for the panel; unit rate for devices counted on the survey	Medium Cable routes above ceilings not yet seen	A Civil Defense finding at the next inspection; renewal of the Salamah safety licence at risk
YEAR 1					
C-02	**Guest room fan coils** 176 rooms, floor by floor with the room refurbishment; quiet EC fans, new drain pans and thermostats	▮▮▮ > 2m	Unit rate per room × 176, from the mock-up room	Medium Branch valves and drain lines found on opening up	Weekly noise complaints continue; drain-pan leaks stain ceilings
C-03	**Generator transfer switch** Replace the ATS; changeover witnessed three times; annual load bank test after	▮ < 0.5m	Quotation	Low Like-for-like in the existing board	Emergency power may not transfer on an SEC supply outage
YEAR 2					
C-04	**Chillers** Three air-cooled units replaced one at a time, November to March; selected for 48 °C ambient	▮▮▮ > 2m	Budget quotations from two makers; allowance for crane, plinths and temporary cooling	High Roof slab, plinths and whether two units carry the load	An unplanned failure in peak summer; refrigerant top-ups harder to source
C-05	**Hot water plant** Calorifiers replaced; circulation rebalanced. Stored at 60 °C, return at least 55 °C, 50 °C at the tap within one minute	▮ < 0.5m	Quotation	Low Plant room access confirmed	Top-floor taps slow to reach 50 °C at peak; harder Legionella control
C-06	**Fire pumps and sprinklers** Jockey pump replaced; every painted head replaced	▮ < 0.5m	Quotation for the pump; unit rate per head	Medium Painted heads in rooms not sampled	Painted heads may not operate; the pump keeps cycling
YEAR 3					
C-07	**Fresh air handling units** Coils replaced and EC fans fitted in the existing casings	▮▮ 0.5–2m	Quotation; energy saving estimated from the logged fan run hours	Low Casings sound	Fans run longer to do the same job; higher bills
MONITOR · OUTSIDE THE THREE-YEAR PLAN					
–	**LV switchboard** Rated 4 of 5; one hot joint (IA-01) tightened and re-scanned as maintenance, not CapEx	–	–	–	Yearly thermal imaging; replacement year tracked in the lifecycle plan (CT-24), which looks five years ahead

Value band (example): under SAR 0.5m · SAR 0.5–2m · over SAR 2m. Specimen only: no prices are given here, and your plan carries the estimate for each line in SAR.

Contingency is set line by line from how firm the basis is: a quotation carries the least, an allowance for what can't be seen the most. Hidden conditions are provisional quantities (remeasured at a tendered rate) or named provisional sums, not a blanket margin.

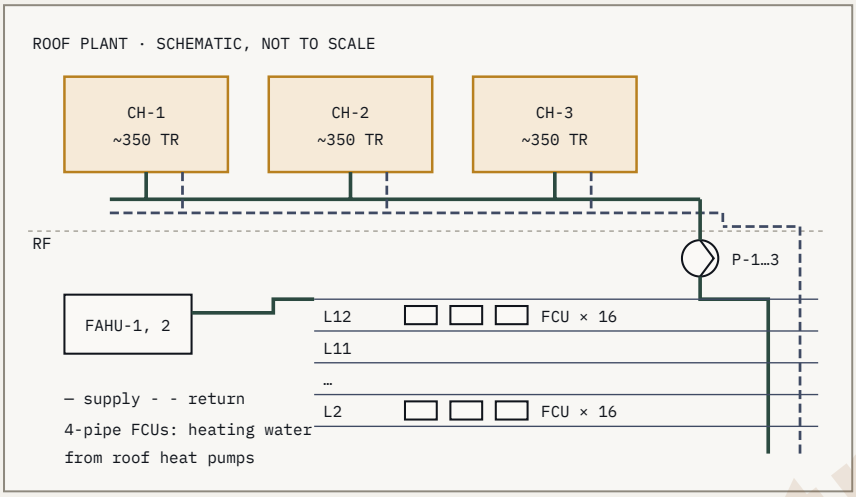
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SYSTEM SHEET S-04 · HVAC

Chilled water plant

2 / 5	2–3	C-04	RF-02
Rating: poor	Years of remaining life	CapEx line, Year 2, value band over SAR 2m	Red flag: cost exposure



Equipment	3 air-cooled chillers, about 350 TR each, on the roof
Serves	4-pipe fan coils in 176 rooms, 2 heat-recovery fresh-air units, podium
Condition	All three running; compressors well past expected life
Refrigerant	Being phased out; recovered by certified technicians at replacement, never vented
New plant	Selected for 48 °C ambient, coated condenser coils. Checked at submittal against the SBC 601 and SASO minimum efficiency, which is rated at AHRI conditions

A Replace one unit at a time

Each unit is swapped between November and March. Where the remaining two chillers can carry the load, they do; where they can't, we bring in temporary cooling for each swap. Logging during the survey tells you which before you approve the budget.

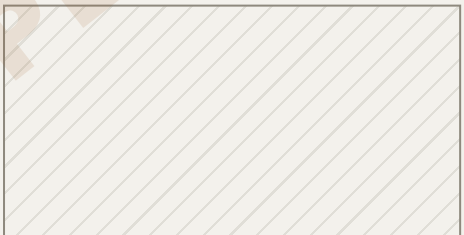
Logged on site (values in your report)

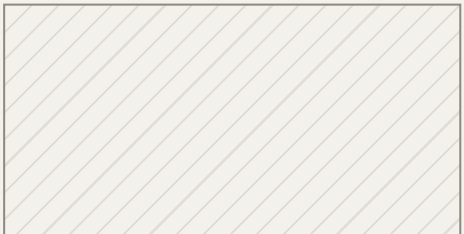
- Chilled water supply and return temperature (ΔT) at the header
- kW/TR logged twice, against outdoor temperature and load: chillers only, and the whole plant with pumps
- Chiller-only results compared with the maker's rated curve at the logged ambient; whole-plant kW/TR is reported on its own, never against the SBC 601 minimum
- Room temperatures on the top floor and the far rooms

B Checked before anything is ordered

- Roof slab and plinths for the new unit weights
- Crane radius, street-closure permit and a lift plan
- Pipework wall thickness at the connections
- Isolation valves test-closed; a pipe freeze or line-stop where one won't hold
- BMS interface, spacing for hot-air recirculation, lead time and order-by date

Summer performance test. In the first July or August after handover we return, log supply temperatures, head pressure and chiller-only and whole-plant kW/TR at peak load, and rebalance if the far rooms are not holding setpoint. The results are added to CT-11, and the item stays open on the defects list until it passes.


P-41 · CH-1 nameplate


P-42 · CH-2 compressor bay


P-43 · Headers and isolation valves

Photo positions only. A real report carries the site photos, each tied to its finding.

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Example only