Case Study

Hotel Domestic Hot Water Plant Design Comparison w/ Low ΔT Heat Pump

Project
- 3-level hotel situated in Melbourne
- Domestic hot water (DHW) plantroom serving 124 rooms + amenities

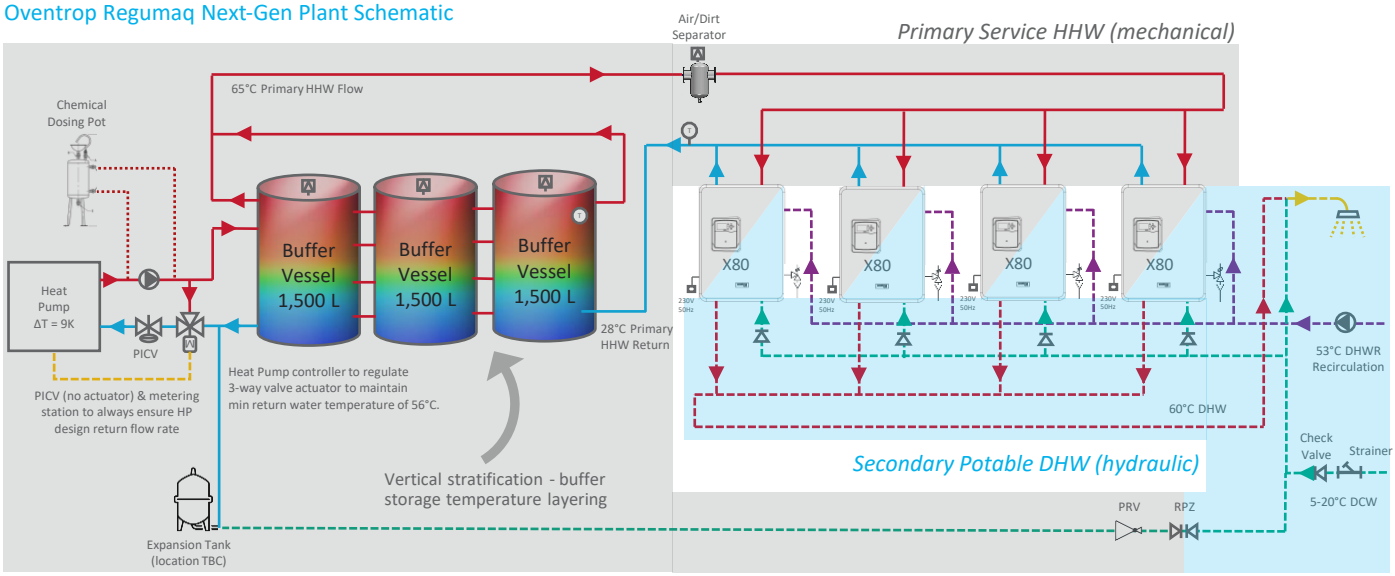
System Parameters
- Hot water consumption estimated at 9900L over 1 hour peak period
- 124 x Hotel Rooms @ 50L per room over 1 hour peak
- 31 x Spa Rooms @ 100L per room over 1 hour peak
- 65 x Restaurant Meals @ 6L per meal over 2 hour peak
- 3 x Laundry Washing Machines @ 70L per machine over 1 hour peak

Areas to Consider
- Water hygiene
- Plant design
- Capital cost
- Running cost
- Water storage
- Tank reload time
- Plant footprint & weight

Initial Design
- Typical domestic hot water heat pump design
- 5 x 2000L stainless steel tanks for potable water storage
- W/M approval required for heat pumps & water tanks
- 4 x 30kW heat pumps

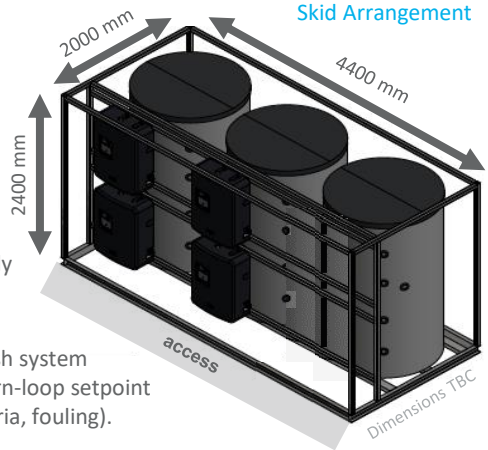
Proposed Design
- Next gen domestic hot water heat pump design
- **3** x 1500L steel buffer tanks for primary-side non-potable water
- 4 x WaterMark approved Oventrop Regumaq DHW stations
- 2 x 77 kW heat pumps

Oventrop Regumaq Next-Gen Plant Schematic



Design Comparison (traditional vs next-gen)
- **Plant space**: 40.5 m² **vs** 30.3 m²
- **Operational weight:** 12,580 kg vs 9,078 kg
- **Capital cost:** $214,300 **vs** $184,150 (excl. install)
- **Reload:** 376 mins (6.3 hours) **vs** 72 mins (1.2 hours) @ 7°C ambient
- **Storage:** 10,000L potable water (SS tanks) **vs** 4,500L service water only (steel)
- **Energy consumption:** $49.42 **vs** $20.56 (cost to heat 9,900L @ avg. rate $0.306/kWh)
- **Efficiency:** Typical **vs** Superior (return water heat re-used = heat gen. temp rise reduced)
- **Maintenance:** Annual TMV service **vs** 10-yr Regumaq flush + annual visual inspection only
- **WaterMark Approval:** Yes (heat pumps & storage tanks) **vs** Yes (Regumaq unit only)
- **BMS Interface:** Card not included in price **vs** BMS module included in price
- **Hygiene:** Typical legionella concerns for stored potable water system **vs** Hygienically fresh system without stored potable water (on-demand DHW = legionella risk eliminated), stable return-loop setpoint temperature, self-cleaning plate heat exchanger (mitigates corrosion, calcification, bacteria, fouling).

Skid Arrangement



↓55% water storage

↓81% reload time

↓25% plant footprint

↓28% weight (op)

↓58% running cost

↓14% capital cost

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