

AIRAH VIC Technical Session

HVAC Rating Tool

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Why a HVAC Tool ?

- Encourage best practice design
- Recognise the importance of commissioning, tuning and ongoing management throughout building life
- Complementary to existing tools
- Clearly in AIRAH's interests to drive the sustainability agenda within HVAC, rather than be led

Background

- AIRAH Working Group set up to discuss advantages/disadvantages of existing tools and determine a way forward
- HVAC tool developed and peer reviewed by industry professionals across multiple sectors in multiple states
- Fundamentally, the tool must be easy to use

Why a Whole-of-Life Tool ?

- At any one time, around 95-98% of commercial buildings are “existing”. Focus on the whole market, not just the development sector.
- Opportunities for major HVAC redesign in a building only come around at year 0 (initial design) or year 25 (end-of-life plant replacement).
- Focus on the design only is with the best intentions but means we live in hope for the next 25 years.
- Continuous improvement through measurable outcomes.

HVAC Rating Tool

- 3 stage Approach has been adopted:
 - A = Design Intent
 - B = Commissioning programs and procedures
 - C = Appropriate maintenance throughout system life

Points Awarded

- A = Design Intent = 44 Points
- B = Commissioning = 28 Points
- C = Maintenance = 28 Points
- TOTAL = 100 points
- 50-59 = 1 star, 60-69 = 2 star.....90+ = 5 star

Part A - Design

- A1 - BCA Section J compliance
 - Mandatory for post-BCA2006 buildings
 - N/A for pre-BCA2006 buildings
- A2 – MEPS – 8 points
 - Input power = MEPS +30+% = 0 points. N/A post-MEPS buildings
 - Input power = MEPS +10-30% = 1 points. N/A post-MEPS buildings
 - Input power = MEPS +0-10% = 2 points. N/A post-MEPS buildings
 - Input power = MEPS -0-10% = 4 points.
 - Input power = MEPS -10-20% = 6 points.
 - Input power = MEPS -20+% = 8 points.

Part A - Design

- A3 – Design Assessment – 20 points
 - Plant configuration (eg. central vs. floor-by-floor)
 - Heat rejection methodology (eg. air cooled, water cooled, geothermal)
 - Cooling methodology (eg. chillers, VRV, evap, nat vent)
 - Economy cycle
 - Cooling medium distribution (eg. DX, primary CHW, secondary CHW, bypass)
 - Heating methodology (eg. gas, electric, reverse cycle)
 - Cooling distribution methodology (eg. CV, VAV, chilled beam, BATISO)
 - On-floor zoning
 - Control Systems (eg. mech control, DDC, BMCS)
 - Metering
 - Accessibility

Part A - Design

- A4 – Overall System Efficiency – 8 points
 - BCA Section J compliance = 2 points
 - NABERS Energy compliance
 - 3star = 2 points
 - +0.5star = 1point
 - 5star = 6 points
 - For <3star, 1 point awarded where in 24months prior upgrades have occurred and have increased rating eg. 1 star to 2 star.

Part A - Design

- A5 – Documentation – 8 points
 - System description = 1 point
 - Design Intent description = 1 point
 - Original as-installed drawings (hard copy + CAD) = 1 point
 - Current as-installed drawings (hard copy + CAD) = 2 points
 - Maintenance manual and schedules = 1 point
 - Maintenance records = 2 points

Part B - Commissioning

- B1 – Commissioning Programme = 3 points
 - Prepare and track against commissioning programme
 - Individual items of plant, systems and integrated systems
 - Existing buildings can achieve the points through a recommissioning programme
- B2 – Commissioning Manager = 3 points
 - Manage commissioning process = 2 points
 - Continue role throughout 12 month tuning period = 1 point; or retain role with the FM team throughout operation = 1 point

Part B - Commissioning

- B3 – Commissioning Guidelines = 12 points
 - Commission or recommission in accordance with CIBSE Guidelines = 8 points
 - Custom-documented guidelines over-and-above CIBSE = 4 points
- B4 – Commissioning Documentation = 5 points
 - Commissioning log books
 - Data sheets, design comparisons, test plans, defects reports, certifications, final commissioning figures etc.

Part B - Commissioning

- B5 – System Tuning = 5 points
 - New buildings = tuning during defects liability period, every 2 months
 - Existing buildings = tuning every 3 months
 - Contiguous 12 month period
 - All tuning to be in accordance with B2, B3 and B4 if points claimed in those items.
 - Monitoring and data logging = 1 point
 - Tuning = 4 points

Part C - Maintenance

- C1 – Maintenance Contracts = 4 points
 - Any form of contract in place (eg. breakdown) = 1 point
 - Preventative/scheduled maintenance contract = 2 points
 - Comprehensive contract; or preventative plus condition monitoring and reporting = 3 points
 - Comprehensive contract with energy/water use monitoring and reporting; or preventative plus condition monitoring and reporting and energy/water use monitoring and reporting = 4 points

Part C - Maintenance

- C2 – Maintenance Specification = 10 points
 - Generic maintenance specification = 6 points
 - Customised maintenance specification with specific equipment details, makes, models, capacities and other relevant info = 10 points
 - Specs based on AIRAH DA19 Maintenance Manual or other applicable publication
 - Note: DA19 has recently been rewritten and is now available with MS-Word schedules. See www.airah.org.au

Part C - Maintenance

- C3 – Maintenance Management = 4 points
 - Electronic maintenance management system
 - Off-the-shelf or custom-written
- C4 – Maintenance Records = 10 points
 - Work orders/job sheets
 - Test results
 - Reports
 - On site data collection
 - Correspondence
 - Parts inventory

Current Status

- Tool is at 90%
- Next-step is a limited pilot study to further assess and refine. 4-building study is proposed
 - New building
 - 10-15 year old building
 - 25 year old building at end of plant life
 - 1960's/70's "dog" which has surpassed end of plant life
- Explore further integration with NABERS



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