

# HVAC&R NEWS

 AIRAH | INDUSTRY JOURNAL

APRIL–MAY 2026 | ISSUE 169

## Skills workshop

Safely handling  
refrigerants in larger  
HVAC&R systems

## All eyes on ARBS

What to expect  
in 2026

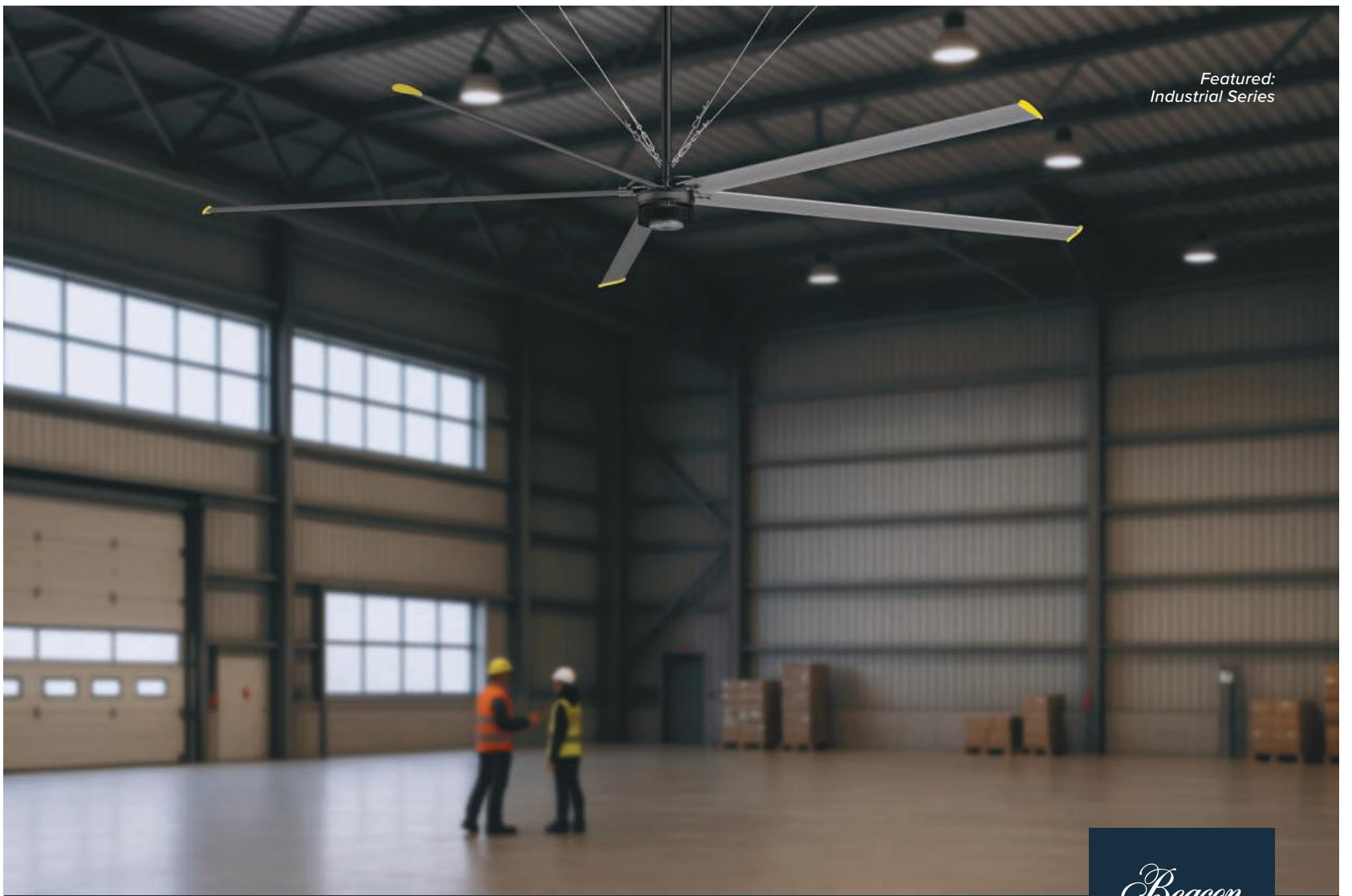
# Humanitarian HVAC&R

Meet a fridgie who's  
helping save lives



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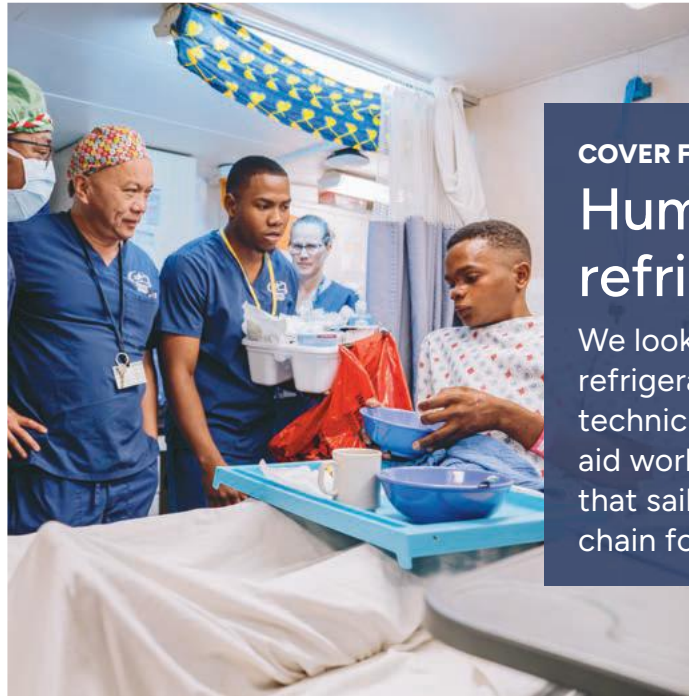
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LIVESTOCK AREAS



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# Beginnings and endings

I was never sure I wanted to be a father until the moment I found out I was becoming one.

I remember the date: Sunday, August 17, 2025. My partner and I had always been open to having a kid, but never gung-ho. For the year or so prior, our philosophy had been, "if it happens, it happens."

Then it happened.

I'd always expected the moment to be a mix of emotions: excitement, anxiety, joy, fear. Instead, my mind provided me with a rare moment of crystal clarity: I was all in on fatherhood.

I'll be taking parental leave – a lot of it. By the time you're reading this magazine, our baby daughter will likely have been born, and I won't be coming back until April 2027. As much as I love writing for and editing HVAC&R News, I can't wait to be a full-time dad for a year.

I'm lucky that AIRAH has been incredibly supportive, from the moment I told the team in October to my last day of work in April. It makes a huge difference to know that my absence will be seen in a positive light rather than perceived as an imposition.

On that note, I'm very happy to introduce Willow Aliento as the acting editor of HVAC&R News while I'm on leave. You might have read her work before; she has extensive experience writing about sustainability and the built environment and has been a regular contributor to AIRAH's publications.

In our interview, the attribute that shone through above all else was her passion for the role of tradespeople in the net zero transition. As readers and HVAC&R professionals, you have a true advocate in Willow.

You'll see this in Willow's article about the fuel crisis on p28 of this issue. We also explore the humanitarian side of HVAC&R, preview ARBS 2026, and look at the latest developments with the National Construction Code. Our skills workshop is a guide to handling refrigerants during maintenance, repair and decommissioning of larger HVAC&R systems.

As one life begins, another tragically comes to an end. The AIRAH team were deeply saddened to learn of the passing of long-time contributing writer Sean McGowan in March after a two-year battle with illness.

From the first ever issue of *HVAC&R Nation* in 2007, Sean has been writing industry-leading feature articles and case studies. He was so much more than a contributor; he really embodied the voice of our industry like no one else.

In his last email to me a couple of months ago, Sean reflected on his extensive career writing about the HVAC&R industry with a thoroughly deserved sense of pride. And while he was frustrated that his health problems had prevented him from writing in recent times, he was grateful to have a loving family who gave him something to focus on and fight for.

It was a poignant reminder that some things are more important than work. The time we get to spend with loved ones is finite – we need to cherish every minute of it.

Nick Johns-Wickberg

EDITOR

✉ [nick.johnsw@airah.org.au](mailto:nick.johnsw@airah.org.au)



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## Hi-Flo Series

### Designed to work without a prefilter

The Hi-Flo next gen bag filters have been developed with performance and sustainability in mind. Performance means long service life, low energy consumption and stable filtration efficiency throughout its lifetime.

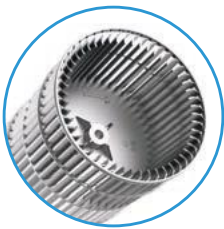
Available in five filtration classes - ePM10 60%, ePM2,5 50%, ePM1 60%, ePM1 70%, ePM1 85%.

[camfil.com](http://camfil.com)

# MIDEA VESTA DUCTED SYSTEM

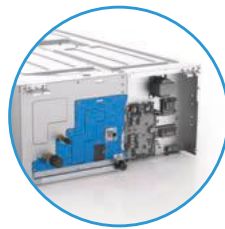


**EFFORTLESS COMFORT · EASY INSTALLATION**



### SILENT STRENGTH, SUPERIOR FLOW

Enlarged blower wheels maximize mixed air intake, while owl-wing-inspired blades boost static pressure for efficient, quiet airflow.



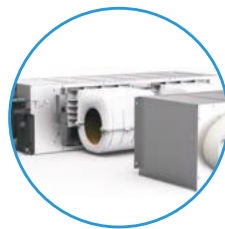
### SERVICE-FRIENDLY DRAIN PUMP

Large drain pump components enhance reliability and can be easily removed as a complete unit for inspection or servicing.



### POWERFUL AIRFLOW PERFORMANCE

Delivers up to 200Pa external static pressure, enabling extended duct runs and flexible installation.



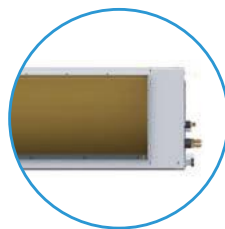
### SPLIT DESIGN FOR EASY INSTALLATION

The split design enables separate movement into tight roof spaces and quick, simple on-site assembly.  
(Available in 14kW - 17kW models)



### STAY COOL UNDER PRESSURE

Midea's Ice Circuit refrigerant technology quickly cools the PCB, maintaining stable, high performance in extreme heat.



### SLIM PROFILE FOR TIGHT SPACES

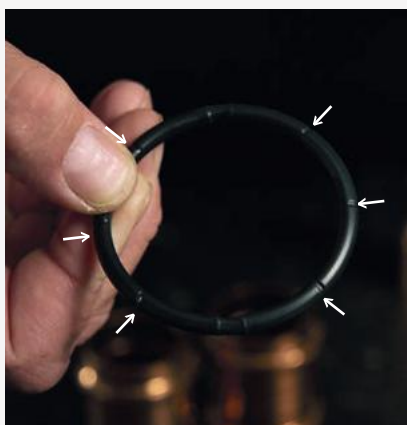
Designed for installations with limited ceiling space, the slim unit maximizes flexibility.  
(Available in 7kW - 12kW models)

>B< Press

# Now with 360° Detect

## We've made unpressed fittings unmissable

Engineered with a smarter leak-path design, >B< Press now with 360° Detect makes it fast and foolproof to identify unpressed water fittings up to 50mm during testing. It's the >B< Press fitting you know and trust, now even safer.



### Extra leak paths

The enhanced design features multiple leak paths around the entire fitting, increasing visibility and reducing the risk of false seals during pressure tests. This makes missed presses easier to detect, even on larger and more complex installations.



### Better in testing

360° Detect is designed to perform exactly when it matters most – during pressure testing. Unpressed fittings release water clearly at both initial and final test pressures, giving plumbers confidence that every connection has been properly pressed before sign-off.



### Built-in safeguard

360° Detect is built into every >B< Press water fitting up to 50mm. It eliminates the risk of missed connections and delivers lasting assurance that every fitting is properly secured. All backed by over 115 years of European engineering and manufacturing.

Conex Bänninger

reece

We've made unpressed fittings unmissable.



**Spot them.**  
**Press them.**  
**Protect your reputation.**

Image of an unpressed >B< Press fitting with 360° Detect during pressure testing



## Packed to the rafters

Trade tools developer Milwaukee has produced a storage solution for outfitting vans called the Packout Rack Kit.

It was inspired by research into the frustrations of trade professionals across various industries, which found that many vans had wasted space, shifting parts and loose materials in the back.

The Packout Rack Kit can be stacked up to three racks high and expanded across the van wall. It has been designed with sliding drawers with adjustable drawer height, which helps reduce time spent unstacking and searching through gear.

It also features adjustable leg heights to allow the rack to fit neatly above wheel wells or alongside rolling toolboxes. Optional compact side plates provide extra storage for frequently used items.

[milwaukeetool.com.au](http://milwaukeetool.com.au)



## Water-to-water solution

Refra has introduced its new OASIS standard line of water-to-water chillers and heat pumps using propane as a refrigerant.

The OASIS series has been designed as a versatile hydronic solution for efficient heating and cooling in commercial and industrial buildings, with shared refrigeration technology and compact design philosophy across the range. Available in single, double and triple configurations, the units follow the Class IV – ventilated enclosure concept defined in EN378, a European safety standard for heat pumps and refrigerating systems.

In accordance with the standard, all refrigerant-containing components are located inside a dedicated enclosure equipped with monitored ventilation and a refrigerant leak detector.

It has cooling capacities up to 410kW and heating capacities up to 51kW, making the systems suitable for commercial buildings, hotels, hospitals, data centres, industrial facilities and district energy applications.

Hussman is the exclusive supplier for Refra in Australia.

Please note: The Queensland Compliance Certifier has indicated to HVAC&R News that these units have not been certified for sale in Australia.

[hussmann.com.au](http://hussmann.com.au)

It is now easier than ever for businesses to switch from gas to renewable heat



## Freebie virtual tool for your kit

The Australian Alliance for Energy Productivity (A2EP) has developed the Renewable Heat Selection Tool to help accelerate the transition from fossil gas to renewable heat.

The AI-powered online tool is easy-to-use, narrowing down the renewable heat options for an application based on a range of factors. A2EP says the tool will help many businesses that are overwhelmed by the number and complexity of renewable alternatives available.

The technology options assessed by the tool include electric thermal energy storage (eTES), electrode boilers, heat pumps, geothermal heat pumps, biogas and biomass boilers, electric resistance boilers and concentrated solar thermal.

[renewableheatselector.com](http://renewableheatselector.com)

## Now with 360° Detect



## Fitter fittings

Conex Banninger, in partnership with Reece, has launched >B<Press 360° Detect – an evolution of the standard >B<Press fitting range, engineered with an improved leak-path design.

While missed press connections can be hard to detect in traditional fittings, Reece says the >B<Press 360° Detect creates a clear, higher-flow leak point in any unpressed fitting.

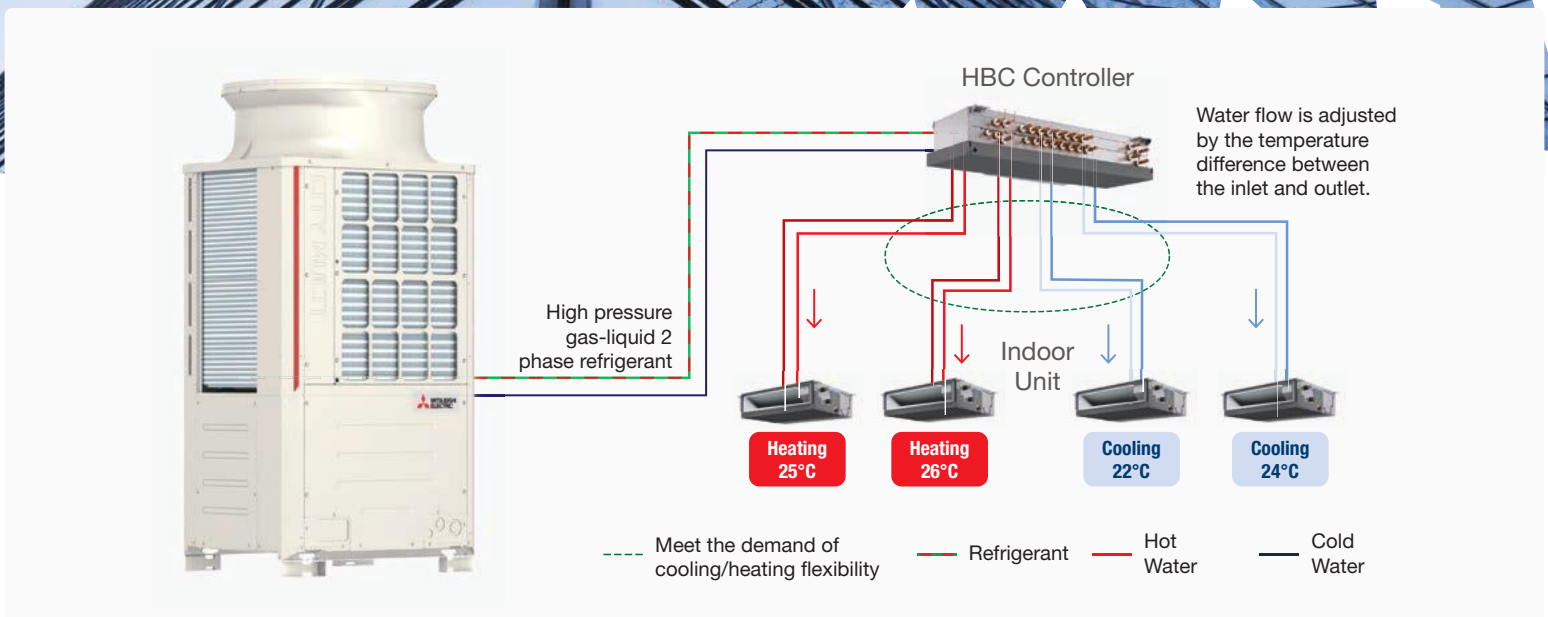
According to the company, the >B<Press 360° Detect offers the following advantages:

- **Extra leak paths:** The upgraded design features multiple leak paths around the entire fitting, increasing visibility and further reducing the risk of false seals
- **Clear visual proof during pressure testing:** 360° Detect ensures that, during pressure testing, unpressed fittings release water visibly and reliably from unpressed joints at both initial and final test pressures, making them instantly obvious.
- **Built-in safeguard:** 360° Detect is integrated into every >B<Press water fitting up to 50mm, eliminating the risk of missed connections
- **Unmissable confirmation:** Installers can quickly identify and rectify any unpressed fittings, reducing costly rework and callbacks.
- **Enhanced confidence:** >B<Press 360° Detect is a built-in safeguard, ensuring that every joint is secure under both low- and high-pressure testing.

[reece.com.au](http://reece.com.au)

# The Industry's **First** VRF Hybrid Technology

Mitsubishi Electric HVRF Outdoor Unit with R32 Refrigerant



The Hybrid VRF system is a two-pipe heat recovery air conditioning system that uses R32 refrigerant and a hybrid refrigerant-to-water design via a Hybrid Branch Controller to provide simultaneous heating and cooling, reduced refrigerant in occupied spaces, and enhanced safety and comfort.



### Refrigerant Concentration Limit

Reduces the need for refrigerant leak detection system.



### Ideal Comfort

Providing milder off coil temperatures using chilled water.



### Less Refrigerant

Refrigerant required only between the outdoor unit and HBC

For more information on our products please visit [mitsubishielectric.com.au](http://mitsubishielectric.com.au) or call 1300 280 625





## Vale Sean McGowan

In March, we bid a sad farewell to long-time *HVAC&R News* and *Ecolibrium* contributing writer, Sean McGowan, who succumbed to cancer after a two-year battle with the illness.

Sean began writing for *Ecolibrium* in the early 2000s when AIRAH's official journal was brought in-house. When *HVAC&R Nation* was launched in 2007, he began writing for the new publication as well.

His stories included case studies, innovative technologies, the refrigerant phasedown, ammonia refrigeration in facilities such as breweries, and myriad other topics tailored to the fridge audience.

Sean will be very much missed by all of us at AIRAH.

[hvacnews.com.au](http://hvacnews.com.au)

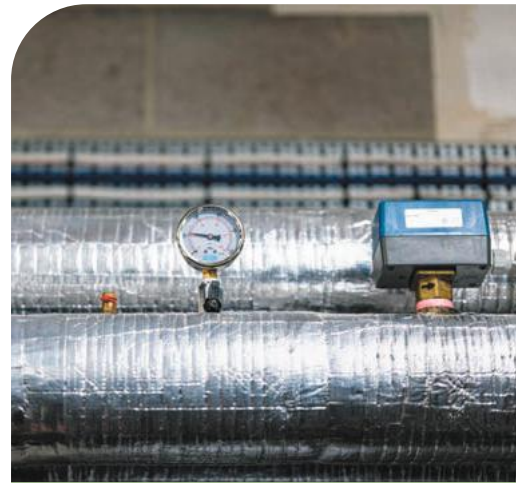


## Baked-in carbon calculations

The NABERS Embodied Carbon rating tool was released in late 2024 and aims to enable new buildings and partial rebuilds to measure and compare their upfront embodied carbon with similar buildings.

The latest version of the rules, Version 2.1, is now available. The major update is that additional types of evidence can be used to prove material quantities in a rating. To help users set targets based on a desired embodied carbon rating, NABERS has also released a reverse calculator. This sits alongside the reverse calculators for other NABERS ratings.

[nabers.gov.au](http://nabers.gov.au)



## Tune up for heat pump incentives

Victoria's Department of Energy, Environment and Climate Action (DEECA) has announced potential revisions to the commercial and industrial heat pump activity available under the Victorian Energy Upgrades (VEU) program.

The changes focus on adjusting the product eligibility thresholds introduced in July 2025 to better define "commercial and industrial-sized" heat pump hot water (HPHW) systems and prevent domestic-sized HPWH units receiving higher incentives than appropriate for the facilities they were installed in.

[energy.vic.gov.au](http://energy.vic.gov.au)



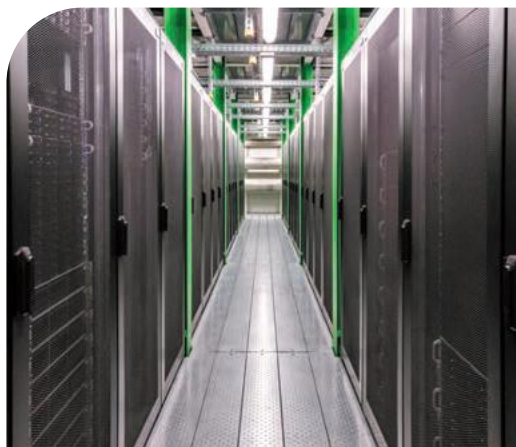
## Plasma vs pollutants

New Zealand's Trust for the Destruction of Synthetic Refrigerants (Cool-Safe) has opened the southern hemisphere's first Steam Plasma Arc (SPARC™) pyrolysis facility for destroying hazardous refrigerants.

The \$10 million National Refrigerant Destruction Facility (NRDF) uses technology developed by Canadian company PyroGenesis. It will be powered by renewable energy and has been designed to destroy up to 100,000kg of gases per annum, representing the mitigation of about 220 million kg of carbon dioxide equivalent (CO<sub>2</sub>e).

The plasma torch operates at temperatures of up to 5,000°C to destroy synthetic refrigerant gases including CFCs, HCFCs, and HFCs with a near 100% efficiency, converting them into safe and stable compounds that can be safely released into the environment.

[coolsafe.org.nz](http://coolsafe.org.nz)



## Gameplan for data centre

The Australian government has announced five key "expectations" for data centres, which it says will ensure their development aligns with Australia's national interests.

They target new and expanded large-scale and hyperscale data centre developments. There is a distinct incentive for developers to take them into consideration, as the government will prioritise approval for projects that align most closely with the expectations, which are:

1. Prioritise Australia's national interest
2. Support Australia's energy transition
3. Use water sustainably and responsibly
4. Invest in Australian skills and jobs
5. Strengthen research, innovation and local capability.

[dceew.gov.au](http://dceew.gov.au)



## 100 not out

This year, Automatic Heating has notched up a century in the trade, thriving and evolving despite seismic shifts in technologies, markets and regulations.

Established in 1926, through four generations of family management, the business has navigated five major fuel transitions – from briquettes and coal through diesel burners and natural gas, to the emerging shift of electrification.

At ARBS in Melbourne this May, the company will be showcasing new IoT systems and its latest Revere heat pump additions. The air-to-water heat pump systems use natural CO<sub>2</sub> as a refrigerant and are approved for use in both New South Wales and Victorian energy efficiency incentive schemes.

[automaticheating.com.au](http://automaticheating.com.au)

## Come see us at ARBS 2026 stand #594!

We can't wait to show you what we've been working on since last ARBS. Our new air movement and digital solutions will blow you away!

Looking to learn more? See us at our stand or at the Speaker Series.

Scan the QR Code to register your attendance, we look forward to seeing you there!

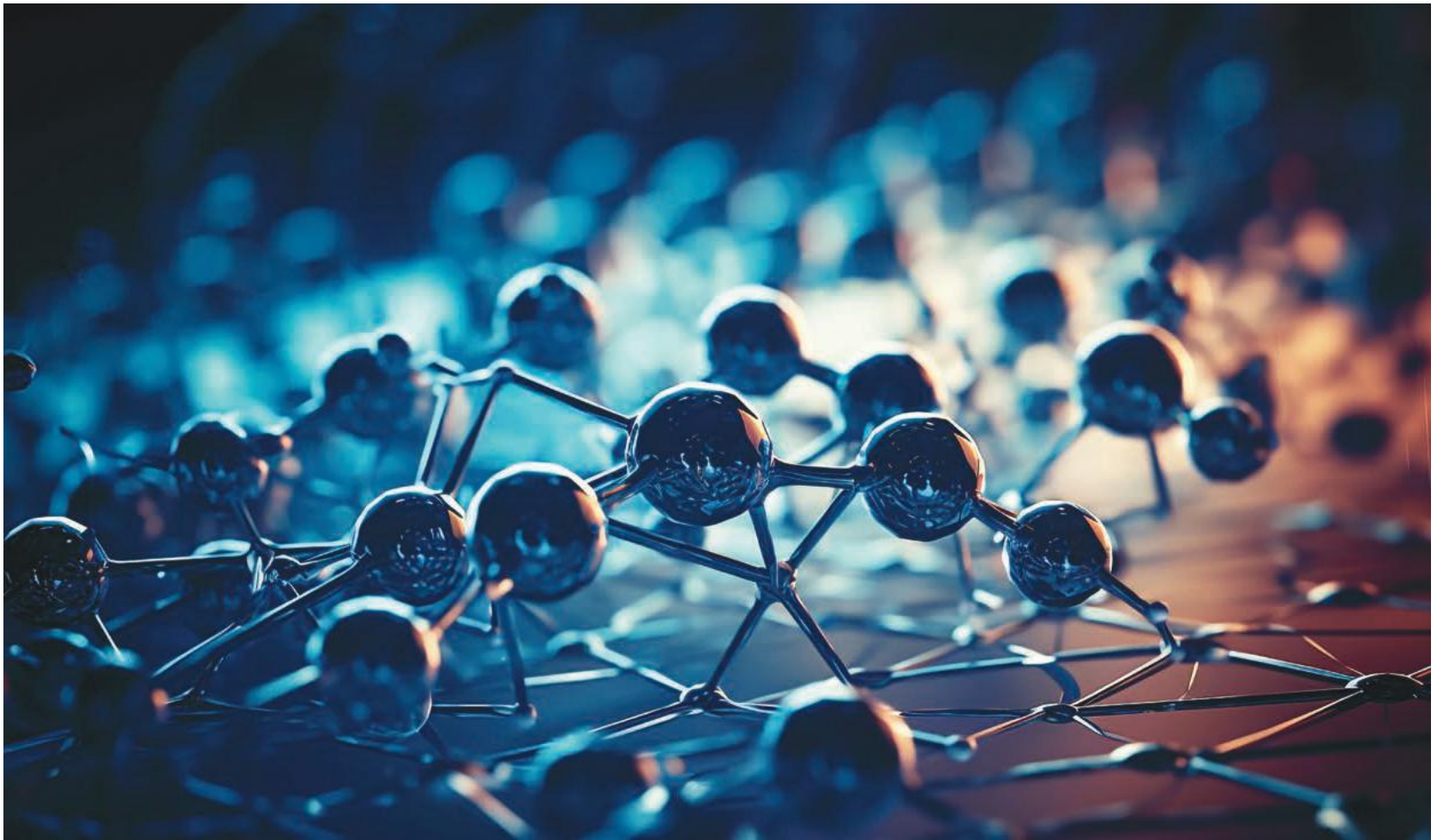


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# Government announces shift in refrigerant management

The federal government has announced that some refrigerants will now be managed under the framework for industrial chemicals, with the potential for new control measures.

In recent years, the Australian HVAC&R industry has voiced serious concerns about the rate at which we are installing and using refrigerant compared to the quotas allowed under our HFC phase-down schedule.

The phase-down was designed under the assumption that market forces would gradually shift the industry away from refrigerants with high global warming potential (GWP) towards more sustainable alternatives. Unfortunately, in some key sectors, a lack of awareness among end users and a preference for lowest first cost has led to the presence of “stubborn” refrigerants in the bank, and in new equipment.

## Have your say

The government is encouraging stakeholders to provide information and feedback during the process. Those interested can subscribe to IChEMS updates, including calls for information and public consultations, by emailing [ichems.enquiry@dcceew.gov.au](mailto:ichems.enquiry@dcceew.gov.au)

## Is the cliff coming?

In commercial refrigeration, R404A (GWP 3,922) remains common. In commercial HVAC, many VRF systems are using R410A (GWP 2,088). And in mobile air conditioning, Australia's import laws still allow vehicles using systems with R134a (GWP 1,430). Because of their high GWP and Australia's decreasing HFC bulk import quota, supply of these refrigerants is becoming increasingly constrained. Experts predict that by the end of 2026, shortages will be acute.

In a communication to industry stakeholders, the federal government has acknowledged concerns about the HFC phase-down.

“Many of you have provided input. We have heard that action across many equipment categories and regulatory certainty are high priorities,” a government spokesperson said.

In response, the government has announced that HFCs and some alternatives to HFCs, including HFOs, have been listed on the Industrial Chemicals Environmental Management Standard (IChEMS) workplan for 2026–27.

## New measures being considered

According to the communication, the Australian government will be considering new measures to manage the environmental risks of this group of chemicals. It says this will be more efficient than considering individual refrigerants and equipment classes.

The government has said possible measures may include restrictions on what certain HFCs can be used for, including in pre-charged equipment. These measures will be developed and finalised by July 1, 2027, with implementation to follow. It is expected the measures will be implemented under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*.

The government says these measures will apply in addition to existing requirements, including the HFC import quota. Further work is underway to bring together current activities across the environment, climate, and work health and safety portfolios in order to provide a clear and complete view of how HFCs will be managed across Australia.

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5-7 MAY 2026, MCEC MELBOURNE

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1800 447 367

hvacsupport@hisense.com





# Call for consistency in licensing and registration

The National Competition Council is reviewing Australia's mutual recognition schemes, including both registration of engineers and licensing of trades.

Inconsistent licensing and registration of workers across borders has long been an issue in Australia, particularly in the building and construction industry. For both engineers and trades, different rules in different states add extra cost and complexity to projects.

## Push for productivity

In 2025, the Productivity Commission undertook a national competition policy analysis that explored how licensing reform could promote occupational mobility. Although a national occupational licence for trades including HVAC&R and electrical was considered, the final report recommended reviewing Australia's mutual recognition system instead.

The mutual recognition system, in theory, allows licensed and registered workers to more easily practice their profession in other jurisdictions by removing need for further assessment of their qualifications, skills or experience. In reality, the current system is weakened by discrepancies between regimes.

In response, the Commonwealth government tasked the National Competition Council with reviewing Australia's mutual recognition schemes for workers. The consultation closed at the end of March 2026, with recommendations to be shared in April.

The review will consider the impact, effectiveness and implementation of current mutual recognition arrangements. The National Competition Council will report on a broad range of issues, including how mutual recognition schemes promote labour mobility and workforce flexibility, how workers are made aware of requirements across state borders, and opportunities for new technologies or processes to reduce costs while improving safety, quality and employment outcomes.

According to the consultation paper, the findings will provide an evidence base to identify solutions that strengthen, streamline or replace current arrangements. This includes the Australian government's commitment to a national approach to occupational licensing for engineering and trades.

## Advocating for harmonisation

Engineers Australia has strongly supported consistent arrangements for registration of engineers. Late last year, CEO Romilly Madew AO said a national scheme would enhance public safety and cut red tape.

"A national scheme for engineers would streamline regulation, improve safety outcomes and help Australia meet its future infrastructure and workforce needs," Madew said.

AIRAH is also supporting harmonisation of schemes across the country – for both engineers and technicians.

"With a single driver's licence you can travel around Australia," says AIRAH CEO Sami Zheng, Affil. AIRAH. "It should be similarly straightforward for engineers and technicians working across borders.

"Running our approved APER accreditation scheme for engineers in four different jurisdictions, we see first-hand how inconsistencies across borders create obstacles and increase costs, and we see the opportunity for improvement."

To inform the review, AIRAH provided feedback on mutual recognition for HVAC&R technicians, based on input from our members. This included examples of inconsistencies between jurisdictions that made it more expensive and complicated to do business.

As an approved assessment entity for professional engineers in Queensland, Victoria, the ACT and Western Australia, AIRAH also provided feedback on mutual recognition for professional engineers.

## Room for improvement

To read AIRAH's submission to the review of mutual recognition systems, scan the QR code.





# Maintenance, repair and decommissioning of larger HVAC&R systems

## MODULE 168

Proudly sponsored by:



### WHAT'S IT ABOUT?

This skills workshop provides guidance on maintaining, repairing and decommissioning systems other than self-contained low-charge HVAC&R systems.

### WHO'S IT FOR?

Relevant for HVAC&R technicians whose work involves retrofits, maintenance, system repairs, and commissioning/decommissioning.



This skills workshop is taken from the 2025 edition of Part 2 of the *Australia and New Zealand Refrigerant Handling Code of Practice*. It provides technicians with the knowledge they need to minimise or prevent refrigerant leaks from HVAC&R equipment, both during operation and at end of life. It makes special mention of requirements for flammable refrigerants.

### General

Technicians handling equipment containing a scheduled refrigerant **must** be competent (i.e. suitably qualified and holding a relevant national licence where required).

Scheduled refrigerant **must not** be discharged to atmosphere. All scheduled refrigerants **must** be recovered and either recycled, reclaimed, or held for destruction in an approved manner.

If the technician doubts the integrity of the system due to leakage rate and charging history, it **must not** be recharged until appropriate repairs and leak testing have been undertaken.

Having identified and located a leak, that part of the system **must** be isolated to minimise the loss of refrigerant. All remaining refrigerant **must** be pumped back into the system receiver or recovered to a separate cylinder if isolation is impractical, after which the repair can be undertaken.

The cylinders designated for the recovery of scheduled refrigerants **should not** be used for recovery of any other refrigerants.

Technicians **should** always read and understand the instructions and advice of the manufacturers and suppliers of all equipment, and apply as relevant and appropriate.

### Refrigerant type

A technician **should** be aware of the possibility that the system may have been incorrectly charged or incorrectly labelled.

Before working on an unfamiliar system the technician **should** first establish the type of refrigerant contained in the system, by checking the pressure/temperature relationship or by using a refrigerant analyser or other methods, and verify that the labelling is correct.

Any refrigerant that cannot be identified **must not** be vented from the system.

If identification of the refrigerant is not possible it **should** be treated as a flammable refrigerant.

### Flammable scheduled refrigerant

When working on appliances containing flammable scheduled refrigerant, instructions conforming to the requirements of AS/NZS 60335.2.40: Annex DD **must** be adhered to.

Manufacturers and suppliers include additional safety information in the operation and maintenance manuals for RAC equipment using a flammable refrigerant. Technicians **should** always read and understand the instructions and advice of the manufacturers and suppliers of all equipment, and apply as relevant and appropriate. Tools and equipment **must** be rated for use with the appropriate flammability grade (2 or 2L).

For flammable refrigerants, if a leak is suspected, all sources of ignition and naked flames **must** be removed/extinguished.

Before beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. Ensure that the area is in the open air or that it is adequately ventilated before breaking into the system or conducting any hot work. Any mechanical ventilation utilised **should** be suitable for use in a potentially hazardous environment. Electrical devices, leads or ignition sources in the vicinity **should not** be energised, unless rated for hazardous environments.

### Maintenance

#### Preventative maintenance

Regular leak tests, inspections and checking of the safety equipment **should** be carried out.

The system instruction manual (see AS/NZS 5149.2) **must** include the maintenance instructions for the entire system with a time schedule for preventive maintenance with respect to leakage.

AS/NZS 5149.4 requires that preventive maintenance be carried out in accordance with the system instruction manual.

#### Inspection

All systems **should** be regularly inspected in accordance with AS/NZS 5149.4, *Section 5.2 Maintenance* and AIRAH's *DA19 – HVAC&R maintenance – Compliance level maintenance*.

The general operating conditions should be checked once a week, including system pressures where readings are displayed, refrigerant sight glass, etc. The condition of condensing equipment should be checked once a week. For air cooled equipment, the condition of the condenser coil should be observed.

A regular inspection program should ensure that the protection offered by the sacrificial anode or other protection where fitted is maintained and that the heat exchangers stay clean and scale-free.

#### In-service leakage inspection

Including in-service leak inspections as part of a preventative maintenance program allows the technician to find and fix small leaks before they lead to complete loss of refrigerant charge.

The in-service leak inspection is carried out with the refrigerant in place and the system operating as normal.

'Inspected for leakage' means that the equipment or system is examined primarily for leakage using direct or indirect measuring methods, focusing on those parts of the equipment or system most likely to leak.

For an in-service leakage inspection, the technician **should** complete:

1. a visual inspection of the system
2. a diagnostic analysis of the system operating parameters
3. a leak inspection of the system, including common leakage points.

**Visual inspection**

The technician **should** review the maintenance records to check where leaks have been found previously. The technician **should** complete a visual inspection of the operating system including, but not limited to, identifying any:

- › visible oil or dust stains on joints, components or insulation
- › movement or stresses due to vibration or thermal expansion
- › signs of corrosion, thermal stress, wear or metal to metal contact points
- › unusual level of noise or vibration from the system.

**Diagnostic analysis**

The technician **should** assess the system/ refrigerant operating temperatures and pressures and compare against the manufacturer’s data and operation instructions to determine whether the refrigerant charge is low.

For systems with fixed-speed compressors, measuring pressure readings coupled with air and refrigerant temperatures allows technicians to assess charge levels against manufacturer data.

For systems with variable speed compressors, diagnostic analysis can involve running the system at maximum output and measuring temperature difference (ΔT) across the heat exchanger at steady state or measuring delivered capacity, which requires measuring ΔT (heating), ΔH (cooling) and airflow.

Some systems have on-board diagnostics for automatic leak detection.

Where diagnostic analysis indicates a low refrigerant charge, a leak tightness test **must** be performed.

**Leak inspection**

Various methods may be used for leak inspection, e.g. electronic leak detectors, ultrasonic leak detectors, proprietary leak

**AS/NZS 5149.4 Recommended in-service leak inspection frequency**

System type/ refrigerant charge	Leak inspection frequency
Self-contained systems, Unit systems	After repair or when leakage is suspected
Hermetic systems ≤ 6kg refrigerant charge	Every 12 months
All other systems ≤ 3kg refrigerant charge	After repair or when leakage is suspected
All other systems > 3kg ≤ 30kg refrigerant charge	Every 12 months
All other systems > 30kg ≤ 300kg refrigerant charge	Every 6 months
All other systems > 300kg refrigerant charge	Every 3 months
Stored refrigerant in cylinders	Every 3 months

detection spray, or ultraviolet fluorescent additives. Electronic leak detectors **must** be specific to the refrigerant type, see Clause 4.9.3.

- › Using a leak detector, assess all joints and components on the system for leakage, with a focus on common leakage points and any areas identified in the visual survey.
- › Follow the leak detector manufacturer’s instruction for leak detection.
- › The results of the in-service inspection **should** be recorded.

Where a leak is detected, all refrigerant **must** be removed from the system or affected section, and the leak repaired.

Where a leak is suspected but not detected, all refrigerant **must** be removed, and the system (or affected section) **must** be leak tightness tested.

**Common leakage points**

The following areas should be individually assessed with a leak detector:

- › **joints** – flare joints, mechanical joints and flanges, brazed joints, catalyst cured joints
- › **valves** – Schrader valves, service valves, manual valves, pressure relief valves/ devices, expansion valves, line tap valves
- › **evaporators and condensers** – corroded areas, return bends, valves and joints
- › **seals** – shaft seals (open compressor), compressor gaskets, seals on replaceable driers and filters, seals on gauge points, seals on caps
- › **other** – capillary tubes, control bellows, O rings and pressure switches.

Access valves **should** have their caps refitted.

**Testing the low-pressure side**

The low-pressure side of a system **must** be placed under a positive pressure before leak testing the evaporator, heat exchanger, expansion valve, solenoid valve, and other components.

Pressure build up in the low-pressure side of the system **must not** exceed the maximum design conditions during testing.

**Testing negative pressure systems**

Negative pressure systems can, if not controlled correctly during testing, burst the rupture disc.

The test pressure **must** comply with AS/NZS 5149.1 when leak testing.

Tube-piercing valves or equivalent devices **must** only be used to gain temporary access to the system where there is no other means of access in order to remove refrigerant. They **must** be removed prior to the completion of service.

The technician **should** ensure that the condenser is clean and serviceable.

If the system has electric defrost, the compressor **should** be switched off and the defrost cycle initiated without pumping down the system to increase the system pressure.

The charging and/or temporary gauge lines and connecting lines and/or flexible hose **should** be evacuated using a vacuum pump to less than 5,000 microns to eliminate air intake.

**Leakage inspection frequency**

**Mandatory leak inspection frequency**

AS/NZS 5149.4 requires that each refrigerating system be subjected to preventive maintenance with respect to leakage in accordance with the system instruction manual, including the frequency of in-service leakage inspections.

**Recommended leak inspection frequency**

In the absence of instructions in the operating manual, the recommended frequency of in-service leakage inspections of AS/NZS 5149.4 **should** be followed.

**Best practice leakage inspection frequency**

The best practice approach to in-service leakage inspections is currently reflected in the European Union (EU) F-Gas regulations, where the frequency is based on tonnes of CO<sub>2</sub> equivalent of the refrigerant charge, and whether a fixed refrigerant leak detection system is fitted.

The tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) of a refrigerant charge is calculated by multiplying the mass of refrigerant charge in tonnes by the global warming potential (GWP) of that refrigerant.

The EU regulations also mandate inspection frequencies for HFO refrigerants, based on refrigerant charge mass.

**Shutdown systems**

In preparation for seasonal shutdown, it is **recommended** that the system be pumped down and the bulk of the refrigerant charge be valved off in the condenser.

Systems equipped with an open-type compressor that have been shut down for periods longer than a month **should** be treated as follows.

**Positive pressure systems**

For systems with separate oil pumps, these pumps **should** be run at least once a month.

On systems where a separate oil pump is not fitted, the shaft **should** be rotated at least once a week to ensure the seal is kept lubricated.

If a system is to be shut down for more than one month the system **should** be:

1. pumped down
2. all necessary valves closed to prevent the escape of refrigerant
3. suitably labelled.

If this is not possible, the system **should** be run once a week for at least half an hour in order to ensure that mechanical seal faces, bearings, etc. have a continuous oil film on their surfaces. This procedure could prevent seal failure occurring over a long period of shutdown.

European Union (EU) F-Gas regulation – Leak inspection frequency

Refrigerant type	Refrigerant charge (tonnes CO <sub>2</sub> e or kg refrigerant)	Leak inspection frequency (months)	
		No fixed leak deflection	With fixed leak detection
HFC and HFC/HFO Blends	5t CO <sub>2</sub> e ≤ refrigerant charge < 50t CO <sub>2</sub> e	12	24
	50t CO <sub>2</sub> e ≤ refrigerant charge < 500t CO <sub>2</sub> e	6	12
	refrigerant charge ≥ 500t CO <sub>2</sub> e	3	6
HFO	1kg ≤ refrigerant charge < 10kg	12	24
	10kg ≤ refrigerant charge < 100kg	6	12
	refrigerant charge ≥ 100kg	3	6

If, after any shut down period of more than one month:

- › the oil pump has not been run, or
- › on compressors with no oil pump, if the shaft has not been rotated periodically, the shaft seal **must** be thoroughly inspected, lubricated and leak tested before starting any maintenance.

### Negative pressure systems

Negative pressure systems can be under a vacuum and could draw in air and moisture both while operating and when they are off.

A method of pressurising the system and controlling the pressure to between 0.3kPa and 2.0kPa gauge **should** be implemented when the system would otherwise equilibrate at a vacuum when not operating.

Once a week the compressor **should** be stopped and the shaft seal checked for excessive oil leakage.

The seal **must** be checked with a refrigerant leak detector if oil leakage is found, opening the compressor only.

This minimises the quantity of refrigerant that might be lost due to any minor leak on the low-pressure side of the system and refrigerant that might leak through the shaft seal.

The compressor **should not** be allowed to pump the suction pressure into a vacuum.

A slight positive pressure is necessary to prevent air and moisture from being drawn into the system through minor leaks and through the now unmoving shaft seal.

### Seasonal start-up

The compressor oil line sight glass, oil pressure and liquid line sight glass **should** be checked upon seasonal startup, after the system has been operated for 15 to 20 minutes.

The condenser and liquid receiver (if used) **must** be checked for refrigerant leaks using a refrigerant leak detector.

The system temperature controller **should** be readjusted to the proper temperature setting if no leakage is confirmed.

## Repairs

### General

Replacement of components or changes to the refrigerating system **should** be ordered and carried out by a competent person.

System components **should** be replaced with parts that are more leak-resistant or have a reduced number of potential leak sources.

An equivalent replacement 'O' ring seal **should** be used each time an 'O' ring connection is remade.

### Repair procedure

Repairs on refrigerant containing components **should** be carried out in the following order, where applicable:

1. recovery of refrigerant, emptying and evacuation
2. disconnecting and safeguarding of the components to be repaired
3. cleaning and purging (e.g. with OFN)
4. carrying out the repair
5. testing and checking of the repair (pressure test, leakage test, functional test)
6. evacuating and recharging with refrigerant.

Following any repair, all safety, control and measurement devices as well as alarm systems **must** be checked to verify operation.

### Breaking into systems

Where not in the open, the area **must** be adequately ventilated before breaking into the system or conducting any hot work.

Systems, or the isolated section of the system, **must** be evacuated and purged with OFN prior to any hot work.

If the system contains any refrigerant, or any other gas under pressure, it **must not** be broken into by means of cutting or breaking pipework.

A portable leak detector **should** be considered when completing cut-in tasks for toxic or flammable fluids.

### Brazing and de-brazing

Where repair work requires brazing or de-brazing or any hot work, all refrigerant **must** be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the repair.

OFN **must** then be purged through the system both before and during the brazing process.

### Oil removal

The compressor crankcase **must** be brought to atmospheric pressure before oil is removed.

Refrigerant content of the oil **must** be minimised using procedures such as evacuation, or the use of crankcase heaters, since the refrigerant vapours are soluble in compressor lubricating oils.

### Tube piercing/line tap valves

Tube piercing/line tap valves or equivalent devices **must** only be used to gain temporary access to the system. They **must** be removed prior to the completion of service.

### Cleaning and flushing

This procedure covers cleaning and flushing a contaminated system after a hermetic or semi-hermetic compressor failure or motor burnout.

### Refrigerant recovery

As many parts of the system as practical **must** be isolated.

All scheduled refrigerants including contaminated refrigerant **must** be fully recovered.

The recovery cylinder **must not** be over-filled, as per AS 2030.5, see Clause 13.4.

Contaminated refrigerant **must not** be recovered in the same cylinder as clean/reusable refrigerant.

Flammable scheduled refrigerants **must** be recovered into appropriately labelled cylinders.

When the system is empty and at atmospheric pressure, the faulty component parts **should** be removed and the system capped off. Small systems should be taken to a workshop with appropriate facilities for cleaning and reinstating.

### Cleaning solvents

Scheduled refrigerant **must not** be used for flushing components.

WHS/OHS safety standards **must** be observed when handling solvents. Relevant Safety Data Sheets must be obtained and made available to the technician handling solvents.

The cleaning solvent **should** be pumped throughout the system until only clean solvent emerges. After ensuring the system has been thoroughly cleaned, caution **should** be taken to ensure no solvent residue remains in the system after purging.

All spent solvents **must** be disposed of in accordance with the Australian state and territory hazardous substance disposal regulations or the New Zealand Hazardous Substances (Health and Safety Reform Revocations) Regulations 2017, as applicable.

Each Australian state or territory has their own laws and policies, and relevant permits, licences and/or registrations that cover transporting, storing, treating and disposing of hazardous waste.

### Cleaning with filter dryers

If it has been established after testing the refrigerant and oil for acidity that the system has only been locally contaminated by the burnout, moisture, or mechanical failure, and does not require the cleaning procedure outlined in Clause 9.12.2, then cleaning of the system by using purpose selected suction and liquid line filter dryers is an acceptable alternative.

When using this method all filters fitted **must** be capable of being replaced with a minimal loss of refrigerant to the atmosphere.

### Reassembly and test

When cleaning is complete, the major component parts **should** be reassembled in the system with the replacement compressor.

It is **recommended** that a suction line filter/dryer (a burnout dryer) be fitted.

The system **must** be pressurised and strength and leak tested in accordance with Clause 8.2.

### Evacuation

The system **must** then be evacuated prior to charging with refrigerant. Refer to Section 5.

A new dryer **should** be fitted while there is zero gauge pressure in the system. If triple evacuation is used, this **should** be done between the second and third stages. If deep evacuation is used, it **should** be done at the beginning of the process.

The system can then be recharged with refrigerant.

### Recharge

The system **must not** be recharged before the system has been fully leak tested, all identified leaks repaired and the system has been evacuated in accordance with Section 5.

Refrigerant used to recharge a system **must** meet the specification for new refrigerant set out by AHRI 700.

Because most lubricants are very hygroscopic and will absorb moisture from the air, they **should not** be exposed to atmosphere for any longer than is necessary.

The system **should** be recharged to the refrigerant quantity shown on the identification plate.

## Decommissioning

### Refrigerant

All scheduled refrigerant **must** be recovered from all parts of the system at the time of decommissioning.

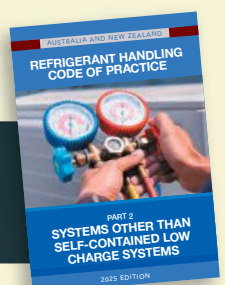
Recovered refrigerant **must** be reclaimed or disposed of in accordance with Section 12.

### Equipment labelling

The RAC equipment **must** be labelled stating that it has been decommissioned and emptied of refrigerant.

The label **must** be dated and signed.

This month's skills workshop is taken from the *Australia and New Zealand Refrigerant Handling Code of Practice, Part 2, Systems other than self-contained low charge systems.*



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**R32 Refrigerant**



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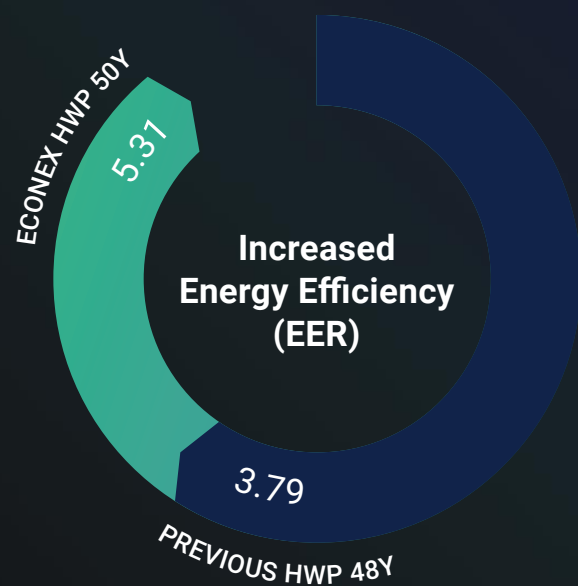
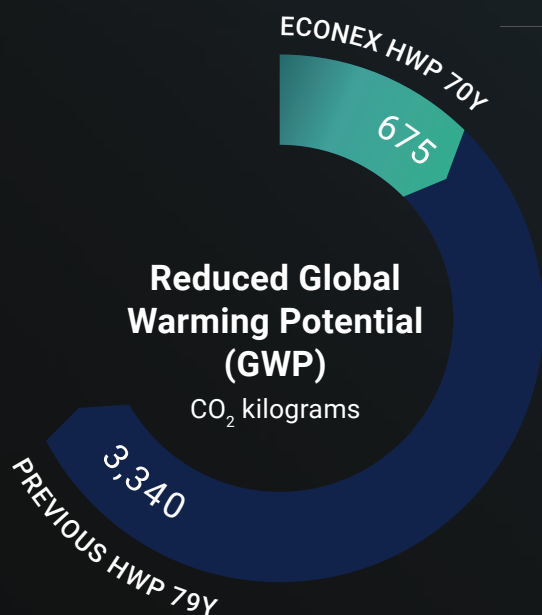
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As professionals and technicians from across the HVAC&R industry gather for ARBS 2026, the future of the building services industry will be on full display. ARBS 2026 will play a significant role in showcasing the latest in building technologies as the push for a greener, more efficient built environment accelerates.

This year the exhibition is taking place at the Melbourne Convention & Exhibition Centre (MCEC) from May 5–7. The organisers are expecting upwards of 10,000 people to attend, so it's shaping up to be an huge event!

## Planning is key

With more than 350 exhibitors, over 100 seminars and technical sessions, and the biannual ARBS Awards, it's worth planning for your trip to ARBS 2026.

The event also includes a show floor with a series of dedicated precincts that will highlight industry knowledge and spotlight emerging innovation.

## What's on show

The 2026 show floor will be located within the exhibition, and industry professionals can explore the targeted experiences.

The pavilions will include:

- › **The Education Pavilion** – A hub that will connect leading training providers and organisations with students, apprentices, educators and employers
- › **The IBTech Pavilion** – This pavilion puts a focus on automation, digital engineering and high-performance building technology. The IBTech Talks Theatre will host daily sessions featuring experts who are reshaping how intelligent buildings are designed and operated
- › **The International Pavilion** – Manufacturers and innovators from around the globe will come together, and attendees can compare global HVAC&R and building-services technologies
- › **The Presentation Theatre** – The Presentation Theatre will offer live technical sessions by exhibitors across three days.

## Slide into a seminar

There are more than 100 seminars and technical talks to attend, so we've made a few key selections to help guide you. Please note that registration is required for some sessions.

### Net zero and the built environment: Turning ambition into action

10–11am on Tuesday, May 5  
at Clarendon Auditorium

**Speakers:** Tina Perinotto, The Fifth Estate (moderator); Mikaila Ganado, F.AIRAH, AIRAH; Davina Rooney, Green Building Council of Australia (GBCA)

This panel brings together leaders from climate policy, energy markets and sustainable buildings to explore how Australia can turn net zero ambition into action. The discussion will examine the economic case for decarbonisation, the risks of falling behind, and the practical steps needed from industry, government and the energy sector to deliver a net zero built environment.

### Indoor air quality: Clearing the air

11.15am–12.15pm on Tuesday, May 5  
at Clarendon Auditorium

**Speakers:** Professor Bronwyn King AO, Air Club and Tobacco Free Portfolios (moderator); Bill McQuade, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); Associate Professor Suman Majumdar, Burnet Institute; Professor Jason Monty, The University of Melbourne

These experts will "clear the air" on what's possible – and what's urgently needed – to provide engineering and HVAC leaders with a forward-looking roadmap for healthier, safer, and more resilient indoor environments.

### The carbon equation: Decarbonising HVAC&R without compromise

12.30–1.30pm on Tuesday, May 5  
at Clarendon Auditorium

**Speakers:** Simon Bradwell, M.AIRAH, ARBS Foundation and ebm-papst A&NZ (moderator); Gary Knox, F.AIRAH, Daikin;

Grace Foo, M.AIRAH, DeltaQ; Steve Yurek, Air-Conditioning, Heating, and Refrigeration Institute (AHRI)

Decarbonisation is reshaping the HVAC&R industry – influencing how systems are designed, manufactured, rated and operated. But how can the sector reduce emissions while still delivering the comfort, resilience, affordability and performance modern buildings demand? This panel brings together industry leaders to explore the real-world pathways to lower-carbon HVAC&R – and the practical challenges the industry must solve to get there.

### Leading the change: Organisations advancing women in HVAC&R

1–1.45pm on Wednesday, May 6  
at Clarendon D

**Speakers:** Mikaila Ganado, F.AIRAH, AIRAH  
The HVAC&R industry is increasingly recognising the need to attract and retain more women across technical, engineering and leadership roles. The discussion will explore what is working, what still needs improvement, and the leadership actions that can help build a stronger and more inclusive workforce for the future.

## ARBS at a glance

When:  
**May 5–7, 2026**

Where:  
**Melbourne Convention & Exhibition Centre (MCEC)**

Exhibition hours:  
**Tuesday, May 5, 2026: 10am–6pm**  
**Wednesday, May 6, 2026: 10am–6pm**  
**Thursday, May 7, 2026: 10am–4pm**

Register for free at  
[arbs.com.au/arbs2026/](https://arbs.com.au/arbs2026/)



### Clear and present danger – Are you up-to-date on flammable refrigerants?

10–10.45am on Thursday, May 7 at Clarendon D

**Speakers:** Simon Bradwell, M.AIRAH, ARBS Foundation and ebm-papst A&NZ (moderator); Kylie Farrelley, Refrigerant Reclaim Australia; Greg Picker, Refrigerants Australia (RRA); Mark Vender, AIRAH

AIRAH, Refrigerant Reclaim Australia and Refrigerants Australia have released a revised Flammable Refrigerants Safety Guide, with support from the ARBS Foundation. In this session, industry representatives will explain why these resources were developed, how they support the sector's transition to flammable refrigerants, and why safe refrigerant management across the entire lifecycle – from installation through to recovery and destruction – is essential.



### Who to see?

Big names and small, ARBS will have them all! The organisers say this year will have the most expansive exhibition yet, comprising more than 350 exhibitors who will showcase HVAC&R equipment, controls, software, automation and building optimisation.

Many exhibitors go all-out with impressive displays at their booths. Some put on special showcases, some have goodie bags, and a few even offer treats like barista-made coffee or soft-serve ice cream!

Of course, we invite you to visit AIRAH at booth 554! AIRAH staff will be on hand to discuss technical resources, programs and opportunities for professional development, educational offerings and courses, and conferences and events. Copies of the latest publications and technical manuals will also be available. Visit us to find out all the great benefits AIRAH membership offers.

## Meet the finalists

The ARBS Awards celebrate and recognise talent in innovative products, projects, service and education from across the HVAC&R and building services industry. The winners will be announced at a gala dinner on Wednesday, May 6, 2026.

### Young Achiever Award

- > **Joshua Budd, Affil.AIRAH**  
– Bellarine & Westcoast Refrigeration
- > **Muhammad Izzul Hakimi bin Roslan**  
– CAMS AssetHub
- > **Finn Veeneklaas**  
– WSP

### HVAC&R Tradesperson Award

- > **Dylan Bryon**  
– TVHS
- > **Corren Cox**  
– Carve Industries and Electrical
- > **Adam Morgan**  
– Clements Airconditioning Refrigeration and Electrical
- > **Jaimee Van Leerdam, Stud.AIRAH**  
– D&E Air Conditioning

### Outstanding Female Award

- > **Tahlia Agnew**  
– SP&R Air Conditioning
- > **Manasa Marasani**  
– GWA Consultants
- > **Deepika Naicker**  
– Actron Air
- > **Jess Thomson**  
– Bueno Analytics

### Education and Training Excellence Award

- > **UEERA0098:**  
**Inspect, Test and Repair Fire & Smoke Control**  
– Superior Training Centre
- > **UEERA0097:**  
**Overview of Daikin VRV Systems**  
– Daikin
- > **VAE Apprentice Training Program**  
– VAE Group
- > **Precise Air Aboriginal Pathways (PAAP) Program**  
– Precise Air Group Pty Ltd

### HVAC Product Excellence Award

- > **ECU45DV Dual-Voltage Environmental Control Unit**  
– Cold Logic
- > **CO<sub>2</sub> Hot Water Heat Pump**  
– Daikin
- > **Braemar Dominator Series**  
– Seeley International
- > **OMICRON Zero HVAC Unit**  
– Eurothermal

### IBTech Product Excellence Award

- > **AI Powered Building Intelligence Platform**  
– Bitpool
- > **Refrigerant Leak Detection Solution**  
– Bueno Analytics
- > **Intelligent Maintenance Platform**  
– Airmaster
- > **Data-Driven Maintenance Solution**  
– Bueno Analytics

### IBTech Project Excellence Award

- > **Intelligent Environmental Monitoring (Regulated Site)**  
– Bitpool & Envirocal
- > **255 Pitt Street, Sydney NSW**  
– IFM Investors, CopperTree Analytics & Exergenics
- > **123 Albert Street, Brisbane Qld**  
– VAE Group
- > **Woolworths Portfolio AI Integration**  
– Bueno Analytics & Woolworths' Energy Management Centre

### Major Project Excellence Award

- > **Queen's Wharf Integrated Resort, Brisbane Qld**  
– Ellis Air
- > **Sydney Metro Martin Place, NSW**  
– AG Coombs
- > **Cabravale Club Resort, Cabramatta NSW**  
– Superior Air
- > **Cultural Institutions Collections Storage Facility, SA**  
– O'Connors

### Minor Project Excellence Award

- > **Kelvin Grove Thermal Energy Project, Qld**  
– NorthWest Healthcare
- > **Eastland Shopping Centre Stage 1 Chiller Replacement, Vic**  
– Airmaster
- > **Leichhardt Park Aquatic Centre Upgrade, NSW**  
– PACE Services
- > **Scentre Group Multi-Asset Retail Centre Intelligent Building Analytics**  
– Bueno Analytics & Scentre Group

### Refrigeration Product Excellence Award

- > **ii915 Acoustic Imager**  
– Fluke Australia
- > **CO<sub>2</sub> Scroll Refrigeration Units**  
– Copeland
- > **Panasonic Transcritical CO<sub>2</sub> (TCO<sub>2</sub>) Outdoor Condensing Unit**  
– Hussmann Australia
- > **DST G300 Gas Sensor**  
– Danfoss Sensing Solutions

**TCL**



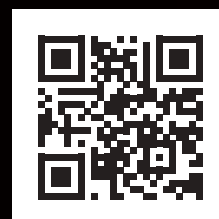
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# Humanitarian Refrigeration

HVAC&R News looks at the crucial role refrigeration and air conditioning technicians play in humanitarian aid work, from surgical theatres that sail the ocean to the cold chain for medicines and supplies.

As it pulls into port towering over the other vessels around it, you might mistake it for a cruise liner. In different circumstances, it probably could have been fitted out to cater to the elite. But this particular ship has far more important work to do than transport the wealthy around in luxury; it's here to save lives.

We're talking about the Global Mercy, a 12-deck, 200-bed floating hospital operated by global charity Mercy Ships. Like its sister ship, the Africa Mercy, it moves from port to port to provide free medical care to those most in need.

For many of its beneficiaries, the Global Mercy is a source of hope, providing critical access to life-saving medical and surgical care that their local health system might not provide, or that they might not otherwise be able to afford. Mercy Ships has also trained more than 40,000 local health professionals, giving them the skills to serve their community after the ship leaves.

The organisation delivered its 100,000th surgery in 2018, with some of the most common procedures being:

- › Removing hernias and goitres
- › Cleft lip and palate repair
- › Removing head and neck tumours
- › Restoring sight by removing cataracts
- › Treating burns to restore motion to limbs
- › Repairing obstetric fistulas
- › Correcting paediatric conditions such as bowed legs and clubfeet.

Since its launch in 2021, the Global Mercy has catered to thousands of patients thanks to the work of around 400 volunteers onboard at any one time. And like any other hospital, it wouldn't be able to function without the HVAC&R systems that operate in the background.

Nick Johns-Wickberg

✉ [nick.johnsw@airah.org.au](mailto:nick.johnsw@airah.org.au)



## The hidden hero

For three years, Kodjo Owusu Ansah has been one of the Global Mercy's truly unsung heroes. As the crew's HVAC engineer, he keeps the ship – including its cold storage facilities, its 7,000m<sup>2</sup> of hospital space, and its six operating theatres – functional and habitable.

Born to a mother from Sierra Leone and a father from Ghana, but living in the Guinean capital of Conakry, Kodjo seemed destined for a career path that spanned national borders. He was also keenly aware of the importance of humanitarian work, having first studied the subject in school. So, when Mercy Ships visited his church looking for day workers, Kodjo applied. It's a decision he doesn't regret, and one that eventually set him on a path away from working as a technician in hotels and towards a much more rewarding career.

"After explaining to us what their mission in Guinea was, I was really touched and inspired to apply, so I did," Kodjo says. "Mercy Ships was a great opportunity for me to use my skills to serve underserved people, to reach out to people who cannot get or afford this kind of proper surgery."

"Personally, I prefer working on the ship to working in the hotel industry, where you are trying to satisfy a guest who pays for the service. On the humanitarian side, you are saving lives, and you see the purpose of what you are doing."

"The reward here is seeing patients walking down the gangway after their successful surgery."

## HVAC&R on the high seas

If you've ever set foot on a large ship, you'll quickly understand just how important HVAC is to its operation. Not only would natural ventilation be impossible in the ship's internal areas, but the nature of the materials the ship is made from – and the lack of insulation in most spaces – means thermal management is particularly important.

"On board the ship, we are essentially in an enclosed space, and this enclosed space needs a ventilation system," Kodjo says. "As HVAC engineers, we aim to bring comfort, which means the right temperature and the right humidity. We work hard to ensure a comfortable environment that enables departments to do their work."

"Without air conditioning, we definitely could not stay on board the ship."

There is, of course, one major difference between the Global Mercy and other vessels of its size – it's also a functioning hospital. With that comes extra factors for Kodjo and his fellow technicians to consider.

"We have strict specifications for temperature levels, which is especially important in the operating rooms, ensuring that surgeons are able to perform surgeries," Kodjo says. "Performing surgery exposes the human body to the environment, so we have to get the right humidity for bacteria not to grow during the period of the surgery. The temperature needed in the operating room is around 20°C and the proper humidity level is between 50 and 60%."

The other vital and often overlooked aspect of Kodjo's work is refrigeration. Without it, food and vital medication would go to waste.

"When we are at sea, we need to conserve our food at the temperature that is required by the manufacturer," Kodjo says. "We have cold rooms and freezers on board, and they are very important."

"HVAC&R on a humanitarian ship is very important and keeps the system running as it should."

## Going with the flow

Kodjo offers a fascinating insight into how HVAC&R systems on ships like the Global Mercy differ to those on land. The key difference has to do with how the Global Mercy uses the vast body of water surrounding it to its advantage.

"It's the same refrigeration cycle, but we have different ways of cooling our refrigerant," Kodjo says. "On land, we have air-cooled chiller systems, which use fans outside to reject heat that has been extracted from internal spaces."

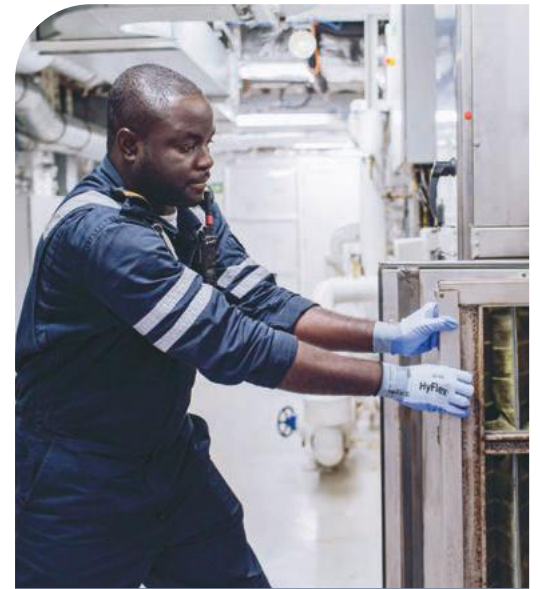
"But on board the ship, we have water-cooled chillers. We intake seawater, which goes through heat exchangers to cool down the refrigerant before coming back to the chiller at a cooler temperature."

This is all enabled by sea chests – innovative compartments in the ship's hull below the waterline that allow for the controlled intake of seawater. That water is used not just for the ship's HVAC&R systems, but also for sanitation, fire control, and ballast. As Kodjo points out, regularly cleaning these sea chests is crucial to remove mud, dirt, and unwanted stowaways like barnacles.

## Riding the waves

If you thought it was tricky to get HVAC&R equipment delivered to Australia, spare a thought for Kodjo and his colleagues. Working in often unstable parts of the world, moving at least once a year, and relying on external companies and organisations to deliver on time can make things very tricky.

"The main challenge we experience is delays in getting equipment to the ship," Kodjo says. "The supply team does their very best to get



## A deeply human moment

While Kodjo finds his everyday work rewarding, the job occasionally calls on him to go above and beyond the typical tasks of an HVAC technician. He remembers one of these moments particularly fondly.

"One time, a hospital chaplain reached out to me and asked for my urgent help to translate English into a local language – Fula – for a patient who just received surgery lasting eight or nine hours," Kodjo says. "That was my first time going into the operating room and seeing that hands-on work in the three years I've been here."

"It took about two hours for the patient to start responding. As soon as she was conscious in the post-anaesthesia care unit (PACU), I had to talk to her in Fula. The patient was holding my hands, and I was very glad I could speak the language and was there to help out."

"The nurses were then able to communicate with her, and she was also able to respond. That is something I will never forget."

The Mercy Ships crew provides medical care that many patients cannot access through their local health system.



## Support Mercy Ships

Mercy Ships uses donated funds to finance vital surgeries for those who need it the most. You can donate by scanning the QR code.



stuff here on time. But some things are outside our control, since we have to depend on other ships to deliver the containers. Sometimes, for example, our filters don't arrive on time."

The other big challenge that's beyond Kodjo's control is the weather. Unlike a building, the ship is regularly on the move, meaning the system has to adapt to a range of difference weather conditions, including widely varying humidity.

"For example, during rainy season here in Sierra Leone, we have to work extra hard to keep our systems clean and running," Kodjo says. "But we have a dedicated and experienced team that is always willing to go the extra mile to keep the ship running and ensure that surgeries are not delayed or affected."

## (Cold) chain reaction

Supply chains are crucial for a medical nonprofit organisation like Mercy Ships. They're also vital in supporting a range of other humanitarian efforts around the world.

Sara Lonergard is the founder and Executive Director of Distribute Aid, a not-for-profit organisation that manages logistics in places affected by humanitarian crises, including active warzones like Ukraine and the Gaza Strip.

In recent years, Distribute Aid has used refrigerated transport to deliver life-saving medicines to hospitals in Ukraine. For Sara and her volunteer colleagues who work remotely around the world, the importance of the cold chain in humanitarian work is not lost.

"[When the cold chain fails], people don't have access to fresh food items, medications, and other items that are essential for human survival," she says.

Conflict zones provide any number of challenges that can break the cold chain, which makes managing these vital deliveries all the more difficult.

"Cold chains face the same risk as traditional supply chains: warehouses can get bombed, roads can become impassable, and aid might be stolen," Sara says.



*"Like most humanitarian aid supply chain solutions, cold chains often require multiple humanitarian and corporate actors to work together to deliver solutions and aid."*

Sara Lonergard

"A lack of electricity can result in cold storage failing, which removes the capability to deliver items that rely on it. In some cases, this can result in large quantities of medications becoming less effective or going bad.

"Access to electricity or fuel for generators is also an important factor to consider, in combination with the cold storage facilities and transportation itself."

## Cool under pressure

So, who actually provides refrigeration services in conflict and disaster zones? As Sara points out, this is usually a team effort, with a mixture of input from governments, non-government organisations (NGOs), and local private companies.

"Like most humanitarian aid supply chain solutions, cold chains often require multiple humanitarian and corporate actors to work together to deliver solutions and aid," Sara says.

"Local companies continue to operate in conflict zones to service their customers – people still need commercial items delivered through cold chains, and it is imperative that they work with NGOs to support aid deliveries."

When the local refrigeration infrastructure is unable to manage the burden, the UN-backed Logistics Cluster steps up to the plate. At the time of publishing, the Logistics Cluster was undertaking emergency activities in 22 countries around the world.

"The UN Logistics Cluster typically takes the lead on developing cold chain capabilities in conflict zones, which other NGOs are then able to use as part of their own supply-chain solutions," Sara says. "They would typically be the provider-of-last-resort, coordinating governments, companies, and NGOs to maintain basic cold-chain capabilities and share access to these resources."

According to Sara, there is a widespread lack of understanding of just how important refrigeration is in providing essential items in conflict zones.

"This is a larger symptom of a more common problem, which is that most people do not understand how supply chains work, or their importance in everyday life," she says. "A better overall understanding may help people see the value of cold chains."

## A rewarding path

Back on board the Global Mercy, Kodjo and his colleagues are thankfully safe from the immediate danger of a warzone. Their work – which will see the ship moored in Sierra Leone until June 2026, before scheduled maintenance and then relocation to Ghana in August – will improve thousands of people's lives this year alone.

Kodjo has never regretted his decision to turn down what would likely be a more comfortable life on the mainland in favour of humanitarian work.

"People come here with tumors, deformities, and conditions they think they cannot get surgery for," he says. "At the end of the day, they go home happy. Particularly young babies who are brought to the ship for surgeries – that alone makes me happy and keeps me inspired to continue doing my work."

He has some simple advice for any HVAC&R technicians who might be considering a sea change: go for it!

"I really would advise anyone out there who has these skills to come on board, put their skills to good use and support a good cause."

## Support Distribute Aid

Distribute Aid accepts donations of money and supplies to ensure it can continue delivering aid to those most in need. You can contribute by scanning the QR code.



Thousands of health professionals have also received training through Mercy Ships. When the ship leaves and they go back home, these skills become an asset for local communities.

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# States confirm plans for NCC 2025

New South Wales and Queensland will defer the 2025 version of the National Construction Code until May 2027, while Victoria will adopt it this year.

In February 2026, the Australian Building Codes Board (ABCB) released a preview of the latest version of the National Construction Code – NCC 2025. This will be published on May 1, 2026, and will immediately become available for adoption by states and territories.

NCC 2025 contains updates focused on commercial and multi-storey residential buildings. Although building ministers have agreed to pause residential changes to the NCC until mid-2029, recent meetings indicated an intention to move ahead with the 2025 version.

Victoria has now confirmed it will adopt NCC 2025 on May 1, 2026, while New South Wales and Queensland will defer adoption until May 2027.

## Victoria presses ahead

In late March, the Allan government announced that NCC 2025 would come into force in the state from May 1, 2026. There will be some variations for Victoria, including a requirement to use lead-free plumbing products, and the continued allowance of expert judgement as an assessment method for structural and fire safety performance solutions.

But there will also be fewer variations overall – almost half of the current number – bringing Victoria closer to the national code.

Victoria's positive approach to NCC 2025 has been welcomed by stakeholders in the HVAC&R industry. AIRAH noted that its members have identified many opportunities in NCC 2025 for reducing costs and improving performance outcomes.

The Housing Industry Association (HIA) and Master Builders Victoria have criticised the move, arguing that it will place pressure on construction businesses that are already struggling in the current climate.

## The detail behind the deferral

As noted above, Queensland and NSW have decided to wait a year before adopting the new code.

The NSW government says that this “will provide the construction industry with more time to adjust to the changes so they can continue to build homes while ensuring key amendments in the code can still be applied to new building work without

significant delay”. It also states that it will minimise future compliance risk and disruption to projects set to start early next year.

The Queensland government says its decision was made in response to stakeholder feedback and that the delay will provide industry adequate time to prepare and adapt to the changes.

As well as deferring the adoption of the new code, both states have indicated they will be making variations, with full details to be confirmed.

In NSW, it will include giving apartment building owners undertaking remedial building works the choice to utilise the waterproofing requirements set out in either the current edition of the NCC or the new NCC 2025. The NSW government says this flexibility is expected to keep costs down for homeowners.

Additionally, the new energy-efficiency standards in the NCC 2025 will not apply to the common areas of apartment buildings.

The details of the variations in Queensland have not been confirmed; however, it is understood that there will be provisions for the continued use of gas in new commercial buildings.

## Who makes the decisions?

There is concern among stakeholders that some state and territory variations are being driven not by unique local needs, but by lobbying groups with specific commercial interests.

*“Overall, AIRAH is a firm supporter of an NCC that is implemented consistently and is updated regularly with input from industry.”*

AIRAH Advocacy  
and Policy Manager  
Mark Vender



"We understand that some jurisdictions have characteristics that require special consideration," says AIRAH's Advocacy and Policy Manager, Mark Vender. "In these cases, and where clearly explained, variations to the NCC can make sense. But they do add complexity and cost for the industry and ultimately for building owners."

Vender also questions whether building ministers are being accurately informed on some of the updates.

"AIRAH has been contacted by parties with what could only be described as poorly informed engineering interpretations of some of the new provisions for multi-storey residential buildings. Unfortunately, we are aware that this inaccurate advice is being sent to building ministers to recommend variations in NCC 2025. We are working with other industry bodies to ensure building ministers are accurately informed."

## A case in point: AS 1668.2:2024

According to Vender, one example relates to AS 1668.2 and the grouping of exhausts that has emerged since the 2012 edition of the standard was referenced in the NCC. He says advice being shared with building ministers about the 2024 standard (referenced in NCC 2025) does not recognise a designer's responsibility to discharge exhaust in a manner that does not cause danger or nuisance. These concerns are reflected in the prevalence of nuisance complaints involving modern apartment construction.

"Our members have confirmed that practical solutions are available, based on sound engineering principles and application of the codes and standards as written," says Vender. "These solutions do not place upward pressure on building costs – or apartment prices."

"The reality is, NCC 2025 offers opportunities for reducing costs and improving productivity. Our members have expressed frustration that these will not be available in some jurisdictions for another 12 months."

Although some of these alternative approaches can be achieved via Performance Solutions, Vender says this adds cost, time and risk during the design phase.

## A future-proof code

At the same time that NCC 2025 is being rolled out, the government has been conducting a consultation on how the NCC can be modernised.

AIRAH has provided feedback to the consultation, identifying opportunities for streamlining sections of the code.

"Much has been made of the 'red tape' in the National Construction Code," Vender says, "but it's important to identify specific opportunities for improvement – which we have done in our submission."

"AIRAH has also called for a comprehensive review of the governance structure behind the



ABC. The current model leaves the door open for stakeholders to lobby for changes at state level, resulting in a patchwork of variations and versions of the code across the country. This impacts the productivity of the building and construction sector."

While acknowledging that the code could be improved, Vender highlights its importance in the Australian built environment sector.

"Overall, AIRAH is a firm supporter of an NCC that is implemented consistently and is updated regularly with input from industry."

Some industry organisations have been more critical. In its submission to the consultation on streamlining and modernising the NCC, the HIA argues that excessive regulation and complexity is slowing the delivery of new homes across Australia.

The paper puts forward changes that the HIA says would simplify the code, reduce red tape and support innovation in home building.

HIA Executive Director of Building Policy Shane Keating says the review offers a chance to reset the code to better support housing supply, productivity and affordability.

"It has become increasingly difficult to build a home in Australia," Keating says. "Builders want to be on site delivering homes for Australians, not buried in paperwork trying to navigate a regulatory maze."

"Over decades the NCC has grown layer upon layer of new objectives and requirements," Keating says. "What began as a technical code focused on issues like structural integrity and fire safety has expanded into a much broader policy tool."

"Many of these changes are well intentioned, but the cumulative impact and their interaction have added complexity and cost to new homes."

## State of play

The ABCB plans to release a full list of adoption dates for states and territories when NCC 2025 is published on May 1, 2026.

# What's in AIRAH's submission?

AIRAH's submission calls for:

- A comprehensive review of the ABCB's board-based governance model
- A clearer and more transparent proposal for change (PFC) pathway, including practical guidance and examples
- Establish a National Chief Engineer to provide independent, cross-portfolio engineering advice on matters such as building regulation and infrastructure performance
- Retaining the three-year update cycle, with smaller changes made immediately
- Ensuring that minimum standards reflect contemporary acceptable performance rather than bare compliance
- Ensuring that analysis used to test NCC changes better reflects whole-of-life costs, opportunity costs related to climate change, public benefits and equity outcomes
- Improving the digital interface for the NCC with better search functionality.

AIRAH's full submission to the consultation is available to read for free on the AIRAH website.

You can access the submission by scanning the QR code.



# Navigating dire straits, from the bowser to the plantroom

From shocks at fuel bowzers through to supply chain disruptions and financial market uncertainty, HVAC&R professionals need to adapt rapidly to the ramifications of the fast-moving Middle East conflict.

As fuel supplies come under pressure and the prices of petrol, diesel and natural gas soar due with disruptions to regular shipments of crude oil and petrochemicals through the Strait of Hormuz, the International Energy Agency (IEA) has suggested some simple measures people in every nation can take to help buffer the blows.

Visiting Australia in March and speaking at the National Press Club, IEA Executive Director, Dr Fatih Birol, said the current situation is the equivalent of combining the oil crises of 1973 and 1979 – plus the gas crisis after Russia invaded Ukraine – into one major crisis.

“The situation is very severe,” Dr Birol said. “The global economy is facing a major threat.”

The disruptions are causing both economic shocks and material impacts on the availability of oil, gas, refined petroleum products, diesel and substances including petrochemicals, sulphur, helium and fertilisers such as urea.

Asia is at the forefront of regions affected due to its traditional reliance on oil products from the Middle East that transit through the Strait of Hormuz.

This has flow-on impacts on transportation and freight, both within the region and throughout the Asia-Pacific. We’re seeing increased costs and reduced supplies of key enablers, including jet fuel, fuel for cargo ships, and diesel for trucking, train and power generators.

It’s not just transport and logistics that are being affected; industrial sectors that rely on petroleum-based products – including all manner of plastics – could face longer-term disruptions.

## Demand-side mitigation

Dr Birol said the IEA is recommending some specific demand-side measures to reduce the global economic burden:

- › Adopt working from home policies where possible to reduce commuter fuel needs
- › Drive at lower speeds on highways
- › Reduce or avoid business air travel.

During question time, the topic of electrifying transport was raised. Dr Birol said he believes the current Middle East conflict will result in a further push for electrification of the transport sector.

AIRAH contacted the Electric Vehicle Council to find out how the market for electric utes and other commercial vehicles is tracking. A spokesperson said that interest has accelerated rapidly, with one auction house

for second-hand EVs reporting a 30% increase in inquiries since the crisis began. There are a growing number of vehicles that have seen three or four years of service in commercial fleets being turned over, the spokesperson said.

## Impacts on general imports

A major concern for import-dependent sectors, which includes HVAC&R, is the potential for cost increases and schedule delays. Pricing of shipping space is highly reactive to shifts in fuel prices. Vincent Clerc, CEO of Maersk, one of the world’s largest shipping lines, told the BBC the carrier has established mechanisms in place for passing changes in fuel prices onto customers.

Clerc said the extra costs of the current situation can mean “anything from a 15% to a 20% increase on some of the freight cost”.

We contacted an Australian third-party logistics provider (3PL) and asked what the likely effects on shipment timelines and costs for imports by sea cargo or air freight are likely to be. According to the spokesperson, the situation is changing so rapidly that the company is not comfortable making any predictions around cargo timelines or shipping costs at the present time.

## Navigating uncertainty and building resilience

The conflict is causing uncertainty for HVAC&R businesses, impacting both immediate operations and long-term planning, says AIRAH CEO Sami Zheng, Affil.AIRAH.

“This is not a short-term disruption. Leaders must take a forward-looking view – understanding that the global landscape is shifting, and that it will not return to what it once was,” Zheng says.



Willow Aliento

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In the short term, businesses may face rising input costs, delays in equipment and component supply, and volatility in energy pricing. Projects may be deferred, margins compressed, and risk profiles heightened. However, the more significant impact lies in the long-term structural shifts now underway. These include accelerated energy transition policies, reconfiguration of global supply chains, and increased emphasis on sovereign capability and local resilience. For HVAC&R businesses, this presents both risk and opportunity.

“This is a moment that calls for deliberate leadership,” Zheng adds. “Uncertainty should not lead to inaction. Instead, it should sharpen our focus on resilience, adaptability, and capability building.”

A long-term mindset is essential.

“Always think beyond the immediate horizon. While the path forward may be uncertain, history shows that industries that invest during periods of disruption emerge stronger.”

*“While the path forward may be uncertain, history shows that industries that invest during periods of disruption emerge stronger.”*

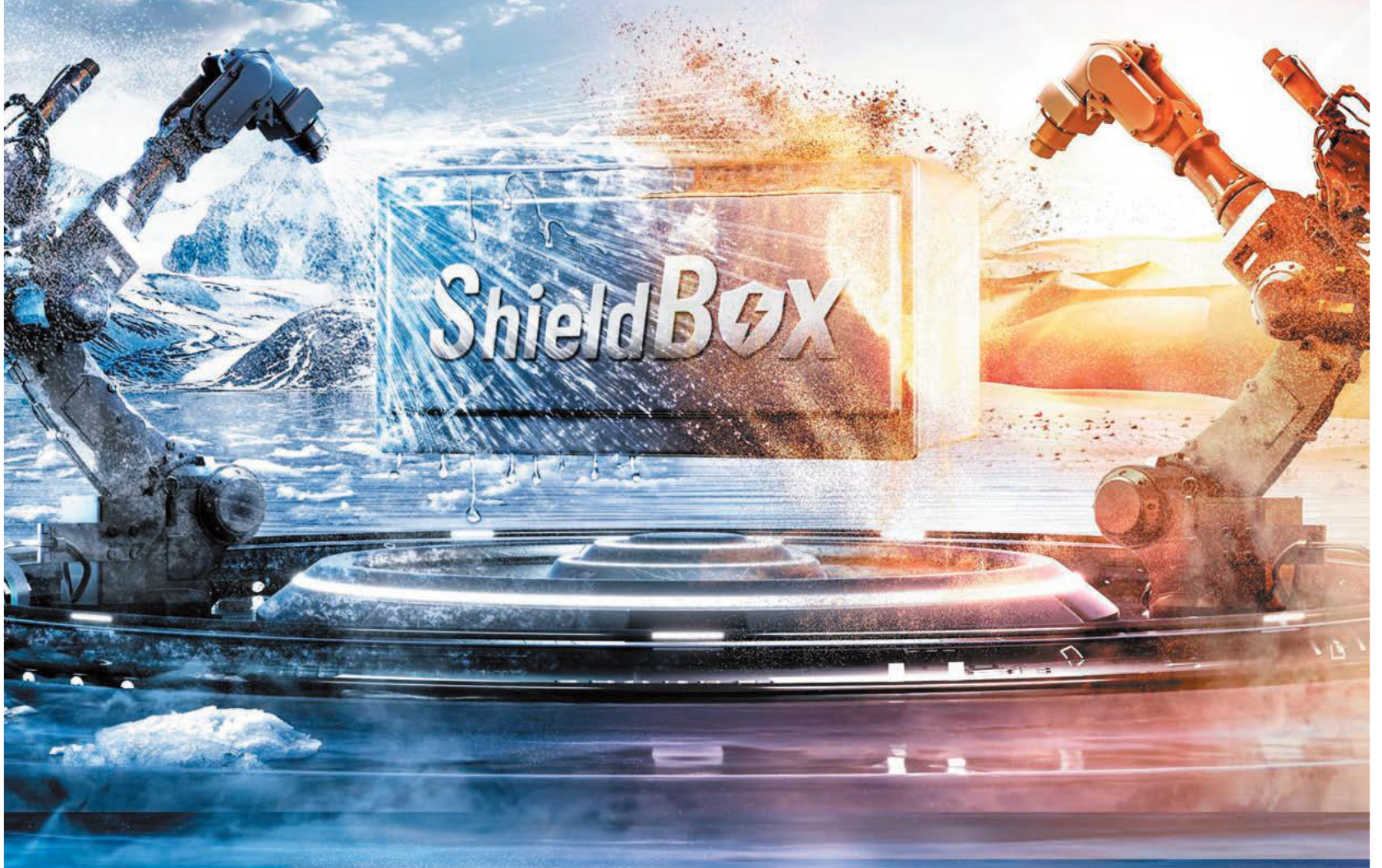


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### 1. No of(fence)

David was strolling down a laneway when he encountered this piece of ... genius? "This is one solution to not having airflow to the outside unit," he says. And while it's not exactly standard practice, David figures that it must work pretty well. "The carpentry work is very good – no gaps!"



There is no limit to the problem-solving abilities of human beings. The installer of this system was not only a lateral thinker, but also something of a perfectionist.

My only concern is the lack of access when it requires maintenance... that, and the apparent fact that it is now 'OK' to build right on the boundary line of a property!



### 2. Double trouble

Peter found this rather imposing installation in a shop in Beenleigh, nestled between Brisbane and the Gold Coast in Queensland. "Obviously the cheapest quote wins," he remarks. We at least hope that this setup is keeping the mannequin in the bottom-left corner cool!



Not sure what to say about this. The installer has included all the right parts to the condensate drain: a trap, a breather, and plenty of fall, together with insulation on the refrigerant lines, so it was most likely a qualified tradie, but the job was clearly done to a minimal dollar value. A secondary observation ... the short run between the fan coil units and the outdoor units may have caused issues for the compressors if the refrigerant charge was not adjusted.



### 3. The evolution of AC

If you can double the trouble, why not triple the treat? Dave recently spotted this "complete history of air conditioning" in a café. "The one on the far right is an original in-wall cooler that must have broken down," he says. "So why not install a brand-new split system next to the old one? Then when that one breaks down, install a new one next to it again!"



The need to patch holes in an ageing building structure has been cleverly overcome with artistic flair! The room air conditioner looks like a mid-80s model (and incidentally, wears the black paint better than the original wood grain), while the Lennox would be from the 2000s, and the LG is maybe early 2020s. Twenty years of service is not a bad run from the first two machines. Hopefully the newest machine will provide equal if not better endurance.

### 4. Fantasy fail

Here at HVAC&R News, we usually try to keep it real. But sometimes the fantasy world of video games produces an HVAC horror that's worthy of Steve's attention. Lauren was enjoying some "festive horror gaming" when she came across this monstrosity. "I guess the real horror is not the monsters we fought along the way, but the very poor ventilation maintenance – and in a hospital no less!"



This is quite a fascinating find. Not only is the foil wrapped insulation held in place with duct tape, but the keen observer will note the two planks of 90x25 timber supporting both sides of the rigid sheet metal elbow as it passes through the glassed area above the doorway – a piece of detail a graphic artist would not normally include. This hints that a "real" hospital was used as the basis for this "online" world.



Additional comments and observations provided by Steve Smith, Affil.AIRAH, Education Relationship Manager at Superior Training Centre.

Please note that the comments are provided on the basis of the photos only and should be read with this in mind – not all issues or solutions are apparent from a 2D image.

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