UPTIME TALENT
MISSION CRITICAL WORKFORCE SOLUTIONS

Mechanical & HVAC Technician Interview Prep and Study Guide

For HVAC techs, mechanics, stationary engineers, plant operators and military mechanical/HVAC/utilities specialists moving into data center and critical-facility work

Online version: https://uptimetalent.com/mechanical-hvac-interview-guide

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Roles covered: Data center / critical facilities mechanical technician, HVAC technician, critical facilities engineer (mechanical-leaning), building engineer, chiller/central plant operator

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1. Who this guide is for

This guide is for job seekers preparing for mechanical and HVAC interviews in data centers and other critical facilities.

It is written for:

- Commercial and industrial HVAC technicians
- Chiller mechanics and central plant operators
- Stationary engineers and building engineers
- Facilities maintenance technicians
- Plant, utility, manufacturing and campus operations technicians
- Data center technicians moving toward mechanical systems
- Controls, BAS/BMS and energy technicians
- Pipefitters, plumbers, millwrights and maintenance mechanics
- Veterans and service members from every branch with mechanical, utilities, HVAC, power plant, damage control, engineering, aviation support or facilities experience

Military examples in this guide include Army, Navy, Air Force, Marine Corps, Coast Guard and Space Force backgrounds. Navy nuclear experience can be relevant, but it is only one example. Many successful critical-facility technicians come from non-nuclear military jobs, civilian trades, industrial plants, hospitals, airports, labs, campuses and manufacturing sites.

The goal is to help you prepare for interviews by understanding what hiring teams usually care about:

- Safety mindset
- Mechanical troubleshooting
- Refrigeration and chilled-water fundamentals
- Critical-facility operations
- Documentation discipline
- Team communication
- Comfort working around live operations
- Willingness to follow procedures

- Ability to escalate when the risk is high

This is not a certification course. It is not a substitute for employer training, site qualification, manufacturer instructions or applicable codes and laws.

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2. What these roles do in data centers and critical facilities

Data centers and critical facilities support equipment that is expected to run continuously. Mechanical technicians help keep the environment within operating limits so servers, network equipment, controls, batteries, electrical gear and support systems can operate reliably.

In many commercial buildings, comfort cooling is the main mission. In a data center, cooling is part of uptime.

Common responsibilities

Mechanical and HVAC technicians in data centers may work on:

- Chillers
- Cooling towers
- Pumps
- CRAH units
- CRAC units
- Air handlers
- In-row coolers
- Rear-door heat exchangers
- Liquid cooling support systems
- Computer room airflow management
- Humidity control equipment
- Water treatment support
- Heat exchangers

- Valves and actuators
- Variable frequency drives
- Sensors and controls
- Leak detection systems
- BMS/BAS alarms and trends
- CMMS work orders
- Rounds and logs
- Preventive and corrective maintenance
- Emergency response

Depending on the site, technicians may also support generators, fuel systems, electrical distribution or fire/life-safety systems at an awareness level. For a mechanical-leaning role, the core focus is usually cooling and water systems.

For a general picture of HVAC and refrigeration work, see the BLS Occupational Outlook Handbook (Source 12).

Uptime mindset

Data centers often operate 24/7. Interviews will test whether you understand that a simple task can have a major impact if it is done without planning.

For example:

- Closing the wrong valve can reduce cooling to a room.
- Changing a setpoint without approval can create alarms or instability.
- Taking a pump offline without verifying redundancy can create a loss of flow.
- Ignoring a small water leak can become an electrical hazard.
- Resetting an alarm without understanding the cause can hide a developing failure.

Strong candidates show respect for live systems.

A good interview phrase is:

> “Before I touch a production system, I want to understand the load, redundancy, current alarms, approved procedure, communication plan and rollback steps.”

Redundancy in plain words

Many production data centers are designed with redundancy so maintenance or failure of one component does not automatically stop the mission.

Common terms:

- **N:** The amount of equipment needed to support the load.
- **N+1:** The site has the required equipment plus one extra unit, path or component.
- **2N:** The site has two independent sets of equipment or paths, each capable of supporting the load.
- **Redundant path:** More than one way to provide cooling, power or flow.
- **Concurrent maintenance:** Concurrent maintenance means maintainable components or paths can be taken out of service for planned work while the critical load remains supported, within the facility's design limits.

In interviews, do not exaggerate. You do not need to be a design engineer. You do need to explain that redundancy only helps if it is available, aligned correctly and not already compromised.

Example:

> “If I am taking one chiller out of service, I need to know whether the remaining chillers, pumps and heat rejection equipment can carry the load under current conditions. I also need to check for existing alarms or maintenance that may have already reduced redundancy.”

Shifts and handoffs

Data centers often use rotating shifts, nights, weekends and holidays. Mechanical technicians may work alone at times, but they should not operate as if they are alone.

Strong shift behavior includes:

- Reading the shift turnover
- Reviewing active alarms
- Checking equipment status

- Understanding open work orders
- Logging rounds accurately
- Communicating abnormal conditions
- Escalating early
- Leaving clear notes for the next shift

Interviewers may ask about shift work because poor turnover can cause missed alarms, repeated work or unsafe conditions.

Change management

Critical facilities often use formal change management. This means maintenance is planned, reviewed and approved before work is performed.

Common documents:

- **SOP:** Standard operating procedure for normal tasks
- **MOP:** Method of procedure for planned work
- **EOP:** Emergency operating procedure for abnormal or emergency conditions

A strong MOP usually includes:

- Scope of work
- Affected systems
- Risk assessment
- Pre-checks
- Required staffing
- Communication plan
- Step-by-step procedure
- Hold points
- Verification steps
- Backout or rollback plan
- Return-to-service checks

In an interview, show that you respect procedure. If a procedure appears wrong, unsafe or unclear, stop and escalate. Do not “make it work” on a live critical system.

3. Common interview formats and how to prepare for each

Phone screen

A phone screen is usually short. The recruiter or hiring manager is checking basic fit.

Expect questions about:

- Your HVAC or mechanical background
- Shift availability
- Safety record and LOTO familiarity
- Refrigerant certification if the role requires refrigerant work
- Experience with chillers, pumps, air handlers or controls
- Comfort working in a 24/7 environment
- Why you want data center or critical-facility work

How to prepare:

- Have a concise background summary ready.
- Know your strongest systems: chillers, DX units, pumps, controls, plant operations.
- Be honest about what you have and have not worked on.
- Avoid long stories unless asked.
- Ask what systems the role supports.

Example summary:

> “I’m an HVAC and facilities technician with experience maintaining commercial cooling equipment, pumps, air handlers, controls and work orders in occupied facilities. I’m used to following safety procedures, documenting work and responding to alarms. I’m interested in data center work because I like mission-critical environments where procedures, teamwork and reliable operation matter.”

Panel or technical interview

A panel may include a facilities manager, lead technician, operations manager, safety representative or engineer.

Expect:

- Refrigeration cycle questions
- Chilled-water and condenser-water questions
- Scenario troubleshooting
- Safety questions
- Questions about rounds, logs and documentation
- Behavioral questions about teamwork and pressure

How to prepare:

- Review the refrigeration cycle until you can explain it simply.
- Practice explaining chilled-water flow from chiller to load and back.
- Be ready to discuss one failure you diagnosed.
- Use first-person answers.
- Say what you would verify before acting.
- Tie technical answers to safety and uptime.

Scenario or whiteboard walk-through

You may be asked to troubleshoot a system on a whiteboard or talk through a diagram.

Examples:

- CRAH discharge air temperature is rising.
- Chilled-water supply temperature is normal, but room temperature is increasing.
- A pump is cavitating.
- Cooling tower approach is worsening.
- A water leak alarm appears near IT equipment.

How to prepare:

- Think in systems, not parts.

- Start with safety and current operating status.
- Use trends, alarms and local readings.
- Separate symptoms from root causes.
- Explain what you would check first and why.
- Identify when you would escalate.

A useful structure:

1. Make it safe.
2. Protect the load.
3. Check alarms and trends.
4. Verify local readings.
5. Confirm flow, temperature, pressure and controls.
6. Compare redundant equipment.
7. Take approved corrective action.
8. Document and communicate.

Hands-on or site walk

Some employers include a site walk or practical discussion near equipment.

They may ask you to identify:

- Pumps
- Isolation valves
- Strainers
- Air handlers
- CRAH or CRAC units
- Sensors
- VFDs
- Piping direction
- Safety hazards
- Access issues
- LOTO points

How to prepare:

- Wear appropriate interview clothing for a mechanical area if told to expect a walk.
- Do not touch equipment unless invited and safe.
- Ask before opening panels.
- Point out that you would follow site procedure before operating anything.
- Talk through what you observe.

Strong site-walk behavior:

> “I would not operate this valve without confirming the system lineup and procedure. From what I can see, I would identify the isolation points, check the pump status, verify the standby unit and review the current alarms before any change.”

Behavioral interview

Behavioral questions test how you acted in real situations.

Common topics:

- Working under pressure
- Admitting a mistake
- Following procedures
- Communicating bad news
- Handling conflict
- Learning a new system
- Responding to an emergency
- Working nights or shifts

Use the STAR format:

- **Situation:** What was happening?
- **Task:** What were you responsible for?
- **Action:** What did you do?
- **Result:** What changed or what was learned?

Keep examples job-related. Do not volunteer protected personal information. Focus on work, training, safety, communication and results.

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4. Technical questions with strong sample answers

Refrigeration and HVAC fundamentals

1. Explain the basic refrigeration cycle.

What they're looking for:

- Clear understanding of compressor, condenser, metering device and evaporator
- Ability to explain heat movement in plain language
- No unsafe or overly memorized answer

Sample answer:

> "I think of the refrigeration cycle as moving heat from where it is not wanted to where it can be rejected. The compressor raises the pressure and temperature of the refrigerant vapor. The condenser rejects heat, desuperheats the high-pressure vapor, condenses it to a high-pressure liquid, and may subcool the liquid. The metering device drops pressure, and the evaporator absorbs heat from the air or water being cooled before the vapor returns to the compressor."

2. What do superheat and subcooling tell you?

What they're looking for:

- Conceptual understanding
- Avoiding fake universal target numbers
- Awareness that readings depend on equipment and conditions

Sample answer:

> “Superheat helps tell me whether the refrigerant leaving the evaporator is fully vapor and how the evaporator is being fed. Subcooling helps tell me whether the liquid leaving the condenser is truly liquid and whether the condenser side is doing its job. I do not assume one target fits every system. I compare readings to the equipment information, operating conditions and site procedure before making a diagnosis.”

3. What is the difference between a CRAH and a CRAC unit?

What they’re looking for:

- Correct distinction
- Data center vocabulary
- Awareness of chilled-water versus DX cooling

Sample answer:

> “A CRAH unit uses chilled water through a coil to cool data center air. A CRAC unit has a direct-expansion refrigeration circuit with a compressor, condenser path, metering device and evaporator. Both can serve computer rooms, but the way they produce cooling is different. In troubleshooting, I would look at chilled-water flow and valve position on a CRAH, while on a CRAC I would also consider refrigerant circuit conditions.”

4. How do hot aisle and cold aisle arrangements help cooling?

What they’re looking for:

- Understanding of airflow separation
- Awareness of bypass and recirculation
- Practical data center knowledge

Sample answer:

> “Hot aisle and cold aisle layouts separate supply air from return air. Cold air is delivered to the server intakes, and hot discharge air is directed back toward the cooling units. The goal is to reduce mixing, bypass air and hot air recirculation. If containment is used, I would also check doors, panels, blanking plates and floor openings because small gaps can affect performance.”

5. What is delta T, and why does it matter in a cooling system?

What they’re looking for:

- Ability to connect temperature difference to heat transfer
- Practical use in chilled water and airflow
- Recognition that abnormal delta T can indicate flow or load issues

Sample answer:

> “Delta T is the temperature difference between two points, such as supply and return air or chilled-water supply and return. Delta T, together with flow rate and fluid properties, indicates the heat being transferred. If delta T is lower or higher than expected, I would look at airflow, water flow, valve position, coil condition and load. I would trend it instead of relying on a single reading.”

6. Explain humidity and dew point in data center cooling.

What they’re looking for:

- Basic psychrometric understanding
- Awareness of condensation risk
- No invented ASHRAE values

Sample answer:

> “Humidity describes moisture content in air; relative humidity, humidity ratio, and dew point express it in different ways. Dew point is the temperature where moisture begins to condense. In a data center, too much moisture can create condensation risk, while too little can contribute to static concerns. I would follow the site’s environmental limits and general ASHRAE thermal guidance rather than guessing. If I saw surfaces below dew point, water on piping or unexplained humidity alarms, I would treat that as a condition to investigate quickly.”

Chillers, towers and water systems

7. Compare air-cooled and water-cooled chillers.

What they’re looking for:

- Basic chiller types
- Understanding of heat rejection
- Awareness of maintenance differences

Sample answer:

> “An air-cooled chiller rejects heat directly to outdoor air through condenser coils and fans. A water-cooled chiller rejects heat to a condenser-water loop, usually through cooling towers. Water-cooled systems add equipment such as condenser-water pumps, towers, strainers and water treatment, but they can be effective for larger central plants. In either case, I would look at load, flow, temperatures, pressures, alarms and maintenance history when troubleshooting.”

8. What are the chilled-water loop and condenser-water loop?

What they’re looking for:

- Correct system flow concept
- Understanding of two separate loops in many central plants
- Ability to describe heat movement

Sample answer:

> “The chilled-water loop carries cold water from the chiller to air handlers, CRAH units or other loads, then returns warmer water to the chiller. The condenser-water loop carries heat from a water-cooled chiller to the cooling tower, where that heat is rejected outdoors. The two loops serve different purposes and usually do not mix. When troubleshooting, I want to know which loop has the issue before adjusting valves or equipment.”

9. What does approach temperature mean in chiller or tower operation?

What they’re looking for:

- Conceptual understanding
- No fabricated target values
- Link to heat transfer performance

Sample answer:

> “Approach is how close a leaving fluid temperature gets to the temperature it is being compared against. On a cooling tower, it is the difference between the cold water leaving the tower and the outdoor wet-bulb temperature. On a chiller or heat exchanger, it compares the leaving water temperature with the refrigerant or other fluid on the other side, so it shows how well heat is being transferred. If approach is getting worse, I would consider fouling, flow problems, air in the system, water treatment issues, load changes or sensor problems. I would trend it and compare it to the equipment’s normal performance.”

10. How does a cooling tower work?

What they’re looking for:

- Evaporative cooling basics
- Makeup water, blowdown and treatment awareness
- Legionella awareness at a general level

Sample answer:

> “A cooling tower rejects heat mainly through evaporative cooling. Warm condenser water is distributed through the tower, air passes across it, and some water evaporates, carrying heat away. Because water is lost to evaporation and drift, the system needs makeup water and blowdown to control concentration of minerals. I would also pay attention to water treatment, cleanliness and biological control practices, including general awareness of Legionella risk, while following the site’s water management procedures.”

11. What pump problems have you seen or would you look for in a chilled-water system?

What they’re looking for:

- Centrifugal pump basics
- Cavitation and flow awareness
- Safe troubleshooting approach

Sample answer:

> “For centrifugal pumps, I look at suction and discharge pressure, vibration, noise, bearing temperature, seal condition, motor current and flow indication if available. Cavitation is a concern when the pump does not have proper suction conditions, and it can sound like gravel or popping inside the pump. I would also look for closed valves, clogged strainers, air in the system, low level in an expansion tank or control problems. I would not keep running a pump that appears to be damaging itself without escalating.”

12. What is NPSH as a concept?

What they’re looking for:

- General understanding, not design calculation
- Cavitation relationship
- Awareness of suction conditions

Sample answer:

> “NPSH compares the available suction head above vapor pressure with the pump's required NPSH to avoid cavitation. I do not usually calculate it in the field unless engineering provides the data, but I understand the concept. If suction pressure is poor, strainers are clogged, valves are restricted or the water is too hot for the conditions, the pump can cavitate. My field response is to check suction conditions, system lineup and alarms before assuming the pump itself is bad.”

13. How do VFDs help in mechanical systems?

What they’re looking for:

- Basic variable-speed control understanding
- Energy and control benefits
- Awareness that VFD alarms require caution

Sample answer:

> “A VFD changes motor speed to match demand, such as varying pump flow or fan speed. That can improve control and reduce unnecessary operation compared with running full speed all the time. In troubleshooting, I would check whether the VFD is receiving the correct command, whether it has alarms, and whether the motor and driven equipment are responding. I would not bypass a VFD or force equipment without approval and understanding the impact.”

14. What valve issues can affect a cooling system?

What they’re looking for:

- Practical valve knowledge
- Controls and mechanical linkage awareness
- System thinking

Sample answer:

> “Valve issues can include a valve left in the wrong position, a failed actuator, a stuck control valve, incorrect stroke, leaking through when it should be closed or a balancing issue. On a CRAH coil, a chilled-water valve problem could look like poor cooling even if the plant is healthy. I would verify command versus actual position, check local indicators if available and compare supply and return temperatures. I would also consider whether someone recently performed maintenance that changed the lineup.”

Data center cooling methods and airflow

15. What are in-row cooling and rear-door heat exchangers?

What they’re looking for:

- General awareness of close-coupled cooling
- Understanding that cooling can be near the rack
- No manufacturer-specific answer

Sample answer:

> “In-row cooling places cooling capacity close to the IT load, usually between or near server racks. Rear-door heat exchangers remove heat at the back of the rack before it mixes into the room, often using a water loop. Both are forms of close-coupled cooling that can reduce the distance air travels. I would pay close attention to leaks, coil condition, fans, valves, controls and isolation procedures because the equipment is close to IT hardware.”

16. What do you know about liquid cooling and CDUs?

What they’re looking for:

- Basic awareness
- Leak and water-quality caution
- Willingness to follow site-specific procedures

Sample answer:

> “Liquid cooling moves heat from IT equipment using a liquid path instead of relying only on room air. A coolant distribution unit, or CDU, helps control flow, temperature, pressure and heat exchange between facility water and the technology cooling loop. I would treat those systems as site-specific and follow procedures closely because leak control, water quality, filtration and isolation are important. I would not assume a chilled-water procedure applies directly to a liquid cooling loop without checking.”

17. How would you identify bypass air or recirculation?

What they’re looking for:

- Airflow awareness
- Practical inspection and trend methods
- Understanding of containment

Sample answer:

> “Bypass air is supply air that returns to the cooling unit without doing useful work, and recirculation is hot exhaust air getting back to equipment intakes. I would look for missing blanking panels, open floor tiles, gaps in containment, cable openings, blocked intakes, poor rack layout or failed fans. I would compare supply and return temperatures, check rack inlet readings if available and use BMS trends where available. I would not start moving tiles or containment pieces without understanding the site airflow plan.”

18. What is the role of economizers?

What they’re looking for:

- General air-side and water-side knowledge
- Awareness of controls and conditions
- No unrealistic claim that economizers are always available

Sample answer:

> “Economizers use favorable outdoor conditions to reduce mechanical cooling. An air-side economizer brings in outside air when conditions are acceptable, while a water-side economizer uses outdoor heat rejection through a water loop or heat exchanger to reduce chiller operation. The controls have to consider temperature, humidity, filtration and site requirements. In a data center, I would follow the approved sequence and watch for unwanted humidity, freezing risk or unstable transitions.”

Controls, alarms and maintenance systems

19. How do you use a BMS or BAS during troubleshooting?

What they’re looking for:

- Alarm and trend use
- Verification with field readings
- Avoiding blind trust in screens

Sample answer:

> “I use the building management system or building automation system to see alarms, trends, setpoints, commands and equipment status. Many sites use the terms BMS and BAS interchangeably. The system helps me understand what changed before the alarm and whether the issue is isolated or system-wide. I still verify critical conditions locally because a sensor, point mapping or communication issue can mislead you. I also avoid changing setpoints without authorization because one change can affect multiple systems.”

20. What should you do if a sensor reading looks wrong?

What they’re looking for:

- Calibration and verification mindset
- Avoiding assumption
- Safe response

Sample answer:

> “First I compare the reading to nearby sensors, trends and physical conditions. Then I use an appropriate field instrument if I am qualified and it is safe to do so. I would check whether the sensor is out of range, disconnected, wet, blocked, poorly located or recently replaced. If the sensor is part of an active control loop, I would be careful because a bad value can drive valves, fans or chillers the wrong way.”

21. How do water leak detection systems work in critical facilities, and how would you respond to an alarm?

What they’re looking for:

- General understanding of spot, pan and cable leak detection
- Awareness that alarms may report through a BMS/BAS
- Safe response around electrical and IT equipment
- Approved isolation and escalation steps

Sample answer:

> “Water leak detection systems use sensors placed where leaks are likely to show up, such as spot sensors, drain pan sensors or sensing cable routed near piping, cooling units or underfloor areas. Those devices often alarm locally and through the BMS or BAS so operations can see the location and respond quickly. I would verify the alarm locally if it is safe, protect nearby electrical and IT equipment, and avoid stepping into water or opening energized panels. If I found a leak, I would follow the approved response procedure, use authorized isolation points if qualified, and escalate before taking any action that could affect cooling or electrical safety.”

22. How do you use a CMMS work-order system?

What they’re looking for:

- Documentation discipline
- Maintenance planning
- Clear closeout notes

Sample answer:

> “I use the CMMS to receive work, review history, document findings and close out tasks accurately. Good notes matter because the next technician may need to know what I found, what I changed and what still needs attention. I include readings, parts used, abnormal conditions and follow-up recommendations. If I find a safety issue or a condition that affects redundancy, I escalate instead of simply closing the work order.”

23. What is the difference between preventive, predictive and corrective maintenance?

What they’re looking for:

- Maintenance strategy awareness
- Examples such as vibration, thermography and oil analysis
- Practical understanding

Sample answer:

> “Preventive maintenance is scheduled work intended to reduce failures, such as filter changes, inspections, cleaning coils and checking belts or bearings. Predictive maintenance uses condition data such as vibration, thermography, oil analysis or trend review to catch problems before failure. Corrective maintenance fixes something that is already failed or not operating correctly. In a critical facility, I want PMs and predictive checks to reduce emergency corrective work.”

24. Why are rounds and logs important?

What they’re looking for:

- Operator discipline
- Trend recognition
- Shift turnover value

Sample answer:

> “Rounds and logs create a record of how the plant is operating over time. They help catch small changes before they become failures, such as rising bearing temperature, abnormal pump noise or a gradual loss of delta T. They also support shift turnover because the next technician can see what changed. I try to write logs so another qualified person can understand the condition without guessing.”

Critical-facility operations

25. What is the difference between an SOP, MOP and EOP?

What they’re looking for:

- Procedure vocabulary
- Understanding of normal, planned and emergency work
- Respect for change management

Sample answer:

> “An SOP is for standard routine operations. A MOP is a detailed method for planned work, especially work that could affect critical systems. An EOP is for abnormal or emergency conditions where quick, controlled action is needed. I follow the approved procedure, stop at hold points and escalate if conditions do not match the procedure.”

26. How would you take a cooling unit out of service without losing cooling?

What they’re looking for:

- Redundancy check
- Communication and procedure
- No casual isolation of live systems

Sample answer:

> “I would first confirm there is an approved procedure or work plan. Then I would check current load, alarms, redundancy, the status of standby equipment and whether any other related equipment is out of service. I would communicate with operations, follow the steps, verify the alternate cooling path is carrying the load and monitor temperatures during the work. If conditions changed or redundancy was not available, I would stop and escalate.”

27. What is change management, and why does it matter?

What they’re looking for:

- Uptime culture
- Planning and risk reduction
- Communication discipline

Sample answer:

> “Change management is the process of reviewing and approving work before it affects a critical system. It matters because even a simple maintenance task can have a larger impact if the plant is in an unusual lineup or another system is already impaired. A good change includes scope, risk, steps, communications, rollback and verification. I see it as a way to protect the load and the people doing the work.”

Refrigerant and environmental compliance basics

28. What are the EPA Section 608 basics for HVAC technicians?

What they’re looking for:

- Correct basic compliance awareness
- No invented thresholds or dates
- Understanding of recovery and no venting

Sample answer:

> “EPA Section 608 technician certification is required to purchase covered refrigerants and to maintain, service, repair, or dispose of covered stationary refrigeration and air-conditioning appliances in ways that could release refrigerant. The certification types are Type I, Type II, Type III and Universal. Intentional venting is prohibited, refrigerant must be recovered using proper equipment, and appliances above EPA charge-size thresholds may be subject to leak-repair, inspection, verification, reporting, and recordkeeping requirements depending on refrigerant type and current rules. I would check current EPA rules and site procedures because requirements can change.”

29. What refrigerant safety hazards concern you?

What they’re looking for:

- High pressure and asphyxiation awareness
- PPE and ventilation
- Conservative safety mindset

Sample answer:

> “Refrigerants can be under high pressure, and a release can create frostbite hazards or displace oxygen in enclosed areas. Some decomposition products can be hazardous if refrigerant is exposed to flame or high heat. I would use the correct PPE, verify ventilation, follow recovery procedures and avoid confined or poorly ventilated areas without proper evaluation. If I suspected a significant release, I would protect people first, notify the right contacts and follow the emergency procedure.”

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5. Troubleshooting scenarios

Scenario 1: CRAH discharge air temperature is rising

Strong step-by-step answer:

1. **Protect the load.**
   I would first check whether the room or row temperature is approaching alarm limits and whether other CRAH units are available and operating.

2. **Review alarms and trends.**
   I would look at the BMS for discharge air, return air, chilled-water valve command, fan status, chilled-water supply temperature and recent changes.

3. **Verify locally.**
   I would confirm the CRAH is running, fans are operating, filters are not heavily loaded and there are no obvious leaks or abnormal noises.

4. **Check chilled-water side.**
   I would compare chilled-water supply and return temperatures, verify valve position, check for flow indication if available and make sure isolation valves are open.

5. **Check controls and sensors.**
   If the BMS says the valve is open but the coil is not cooling, I would consider actuator failure, a stuck valve, air in the coil, blocked strainer or a sensor issue.

6. **Compare similar units.**
   I would compare the affected CRAH to nearby units serving the same area to see whether the issue is unit-specific or plant-wide.

7. **Escalate and document.**
   If cooling is at risk, I would notify operations, follow the EOP or MOP, and document readings and actions.

Scenario 2: Chilled-water supply temperature is normal, but data hall temperature is increasing

Strong step-by-step answer:

1. **Confirm the symptom.**
   I would check whether the temperature increase is local to one area or across the data hall.

2. **Look for airflow issues.**
   Since chilled-water supply is normal, I would check CRAH fans, blocked filters, closed

dampers, failed fan motors, containment doors, missing blanking panels or floor tile changes.

3. **Check water flow to units.**
   I would verify valve positions, coil delta T, strainers and whether control valves are responding.

4. **Review recent changes.**
   I would ask whether any racks were added, containment was modified, maintenance occurred or floor tiles were moved.

5. **Use trends.**
   I would compare return air, discharge air, fan speed, valve command and room temperature over time.

6. **Protect redundancy.**
   If multiple units are near capacity, I would escalate early and avoid taking any cooling equipment offline.

7. **Document root cause.**
   Once stabilized, I would record what changed, what was corrected and what follow-up is needed.

Scenario 3: Pump is noisy and appears to be cavitating

Strong step-by-step answer:

1. **Do not ignore it.**
   Cavitation can damage the pump, so I would treat it as a condition that needs prompt attention.

2. **Check system status.**
   I would verify whether there is a standby pump and whether load can be supported if this pump must be stopped.

3. **Review readings.**
   I would check suction and discharge pressure, vibration, motor current, flow indication, pump speed and alarms.

4. **Inspect likely causes.**
   I would look for low suction pressure, a clogged strainer, closed or throttled suction valve, air in the system, low system level or abnormal water temperature.

5. **Follow procedure.**
   If switching to a standby pump is required, I would follow the approved procedure and verify the standby pump is ready.

6. **Escalate if risk remains.**
   I would notify the lead or operations team before damage or loss of flow occurs.

7. **Document conditions.**
   I would record readings before and after action so the root cause can be investigated.

Scenario 4: Cooling tower performance is degrading during warm weather

Strong step-by-step answer:

1. **Check current load and alarms.**
   I would look at condenser-water supply and return temperatures, tower fan status, pump status, basin level and chiller alarms.

2. **Inspect airflow and water distribution.**
   I would check for fan problems, blocked intake areas, poor water distribution, clogged strainers or fouled fill if accessible and safe.

3. **Check water side basics.**
   I would verify makeup water, blowdown operation, basin level and obvious signs of scaling, biological growth or debris.

4. **Review trends.**
   I would look at tower approach and compare current performance to normal performance under similar conditions.

5. **Consider controls.**
   I would verify fan speed commands, temperature sensors, valve positions and sequencing.

6. **Follow water treatment procedures.**
   I would not add chemicals outside the site program. I would report concerns to the

responsible team or vendor.

7. **Protect chiller operation.**
   If condenser-water temperature is threatening chiller reliability, I would escalate and follow the site response plan.

Scenario 5: Water leak alarm near IT equipment

Strong step-by-step answer:

1. **Treat it as urgent.**
   Water and electrical equipment create serious risk. I would respond quickly while following access and safety procedures.

2. **Notify operations.**
   I would communicate the alarm location and request support if required by site procedure.

3. **Verify the alarm safely.**
   I would check the reported area for visible water, activated leak cable, a wet pan sensor, a spot detector alarm or nearby BMS indication, but I would not step into water near energized equipment.

4. **Do not create a larger problem.**
   I would not move energized equipment, open electrical panels, silence alarms without authorization or bypass leak detection.

5. **Identify the source if safe.**
   I would look for leaking piping, condensate overflow, humidification equipment, cooling coils, valves, hoses or roof/drain issues.

6. **Contain and isolate under procedure.**
   If trained and authorized, I would use spill control methods and isolate the source using approved valves or drains.

7. **Protect cooling.**
   If isolating a leak affects a cooling unit, I would verify redundancy and follow the MOP or EOP.

8. **Document and follow up.**
   I would record the location, source, affected equipment, corrective actions and any required cleanup or inspection.

Scenario 6: Chiller trips during high load

Strong step-by-step answer:

1. **Protect the facility first.**
   I would check whether remaining chillers and pumps are carrying the load and whether room temperatures are stable.
2. **Review the alarm.**
   I would identify the trip condition from the chiller interface and BMS without repeatedly resetting it.
3. **Check supporting systems.**
   I would look at chilled-water flow, condenser-water flow if applicable, tower operation, pump status, valve positions and power/control alarms.
4. **Do not force a restart blindly.**
   A trip may protect the equipment. I would follow the approved reset or restart procedure only after checking the cause.
5. **Communicate.**
   I would notify operations, the lead technician and any required escalation contacts.
6. **Monitor recovery.**
   If the chiller is returned to service, I would watch temperatures, pressures, flow and load sharing.
7. **Document.**
   I would capture alarms, readings, timeline and actions for follow-up.

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6. Safety questions and answers

1. What is lockout/tagout, and when do you use it?

Answer:

> “Lockout/tagout is the control of hazardous energy before servicing or maintenance. I use it when work could expose me or others to electrical, mechanical, pressure, thermal, hydraulic, pneumatic, chemical or other stored energy. I follow the employer’s written procedure, isolate energy sources, apply locks and tags, release or control stored energy and verify the equipment is in a safe state before work. I do not rely only on a stop button or control screen.”

2. What stored energy matters in mechanical work?

Answer:

> “Stored energy can include pressure in piping, trapped refrigerant pressure, spring force, elevated equipment, rotating parts, thermal energy from hot or cold surfaces and electrical energy in motors or drives. In chilled-water, condenser-water and refrigerant systems, pressure can remain even after equipment is shut down. I verify zero or controlled energy using the site procedure before opening a system. If I am not sure, I stop and ask.”

3. How do you approach electrical safety as a mechanical technician?

Answer:

> “I treat circuits as energized until proven otherwise by a qualified person using proper test methods. I do not open energized electrical equipment unless I am authorized, qualified and following the required electrical safety procedure. For mechanical troubleshooting, I may observe status lights or BMS readings, but I do not cross into electrical work beyond my qualification. If absence of voltage must be verified, it must be done with a properly tested meter and approved procedure.”

4. What would you do if a supervisor asked you to bypass a safety device to keep equipment running?

Answer:

> “I would not bypass a safety device as an informal workaround. I would explain the risk and ask to follow the approved procedure or escalation path. If there is an emergency, the site should have an emergency operating procedure and management authorization process. Protecting uptime does not mean defeating safeties.”

5. What hazards exist around refrigerants?

Answer:

> “Refrigerants can displace oxygen, especially in enclosed areas, and they can be under high pressure. Contact can cause cold burns, and a release can create visibility, breathing or evacuation concerns depending on the space. I use recovery equipment, PPE, ventilation and leak response procedures. I also follow EPA requirements and do not intentionally vent refrigerant.”

6. What is confined space awareness for this role?

Answer:

> “Some mechanical areas, tanks, pits, vaults or sumps may be confined spaces or have limited access and ventilation. I would not enter a confined space unless it has been evaluated and I am trained, authorized and following the site entry procedure. Mechanical technicians can be tempted to ‘just check something,’ but that is how people get hurt. If there is any doubt, I stop and get the proper evaluation.”

7. How do you work safely around rotating equipment?

Answer:

> “I keep guards in place, stay clear of shafts, belts, couplings and fans, and avoid loose clothing or anything that could be caught. I do not reach into operating equipment. For maintenance, I follow LOTO and verify the equipment cannot start unexpectedly. After work, I make sure guards and covers are restored before return to service.”

8. What do you do if you see water near electrical equipment?

Answer:

> “I treat it as a serious hazard. I keep people away, notify operations and follow the emergency or leak response procedure. I do not step into water near energized equipment or open panels. If isolation is needed, it should be done by qualified personnel under the site procedure.”

9. What fire suppression awareness should a mechanical technician have?

Answer:

> “I should know the site alarm response, evacuation expectations and who to notify if I see a fire, smoke or accidental discharge condition. I should avoid blocking access to fire protection equipment and avoid creating dust, heat or work conditions outside the permit process. I do not need to be the designer of the system, but I do need to understand that fire and life safety systems are critical and should not be impaired without approval. Any impairment should follow site procedure.”

10. What safety standards or regulations are relevant to this work?

Answer:

> “For lockout/tagout, OSHA’s hazardous energy requirements are important. For electrical work practices, OSHA electrical safety requirements and NFPA 70E are commonly referenced by employers. For refrigerants, EPA Section 608 applies to certification, recovery, venting prohibition and certain leak-repair requirements. I follow the employer’s procedures, current rules and my qualification level.”

7. Behavioral questions with STAR examples

1. Tell me about a time you caught a problem before it became a failure.

Background: Civilian commercial HVAC technician

Situation:
I was doing a routine PM on a commercial air handler serving a large occupied area. The unit was still cooling, but the supply air temperature had started drifting higher than normal.

Task:
My job was to complete the PM, identify any developing issues and avoid disrupting the building.

Action:
I checked filters, belts, coil condition, valve position and trend history. The chilled-water valve command looked normal, but the air temperature drop across the coil was smaller than expected. I found the actuator linkage was slipping, so the valve was not opening as far as the controls indicated. I reported it, replaced the failed linkage under the approved work order and verified operation.

Result:
The unit returned to normal performance without an emergency call. The customer avoided a comfort issue, and the work order notes gave the next technician a clear record of the finding.

2. Tell me about a time you followed procedure even when there was pressure to move faster.

Background: Plant or utility operator

Situation:
At a plant, a pump needed to be swapped to standby during a production period. There was pressure to make the change quickly because temperatures were rising.

Task:
I was responsible for supporting the lineup change without causing a loss of flow.

Action:
I used the operating procedure instead of relying on memory. I verified the standby pump was available, checked valves, confirmed the control mode, communicated with the control room and made the change at the approved step. When one pressure reading did not match the expected value, I paused and had another operator verify the lineup before continuing.

Result:
The standby pump took the load without a process upset. The pause added a few minutes, but it prevented a wrong-valve condition and reinforced that procedure use matters under pressure.

3. Tell me about a time you had to learn unfamiliar equipment.

Background: Air Force facilities or utilities specialist

Situation:
I was assigned to a facility with cooling equipment I had not worked on before. The equipment supported communications spaces, so outages mattered.

Task:
I needed to become useful on shift while staying within my qualification level.

Action:
I read the local operating procedures, walked the system with a senior technician and drew a simple flow diagram for myself. I asked questions about normal readings, alarm response and isolation points. I also reviewed previous work orders to see what failures had occurred before.

Result:
Within a short period, I could perform rounds, recognize abnormal readings and communicate clearly during alarms. I did not claim to be an expert, but I became a safer and more effective shift technician.

4. Tell me about a time you made a mistake and what you did about it.

Background: Civilian building engineer

Situation:
Early in a building engineer role, I closed a work order too quickly after replacing a belt on an

air handler. I did not document the sheave wear I noticed.

Task:
My responsibility was not only to fix the immediate problem but also to document conditions that could affect future reliability.

Action:
When the belt failed again later, I told my lead what I had seen and admitted I should have written it up. We inspected the drive, replaced the worn components and I updated the work order with the full condition and corrective action. After that, I changed my closeout habit to include abnormal observations even if they were not part of the original task.

Result:
The repeat failure stopped, and my documentation improved. I learned that incomplete notes can create extra work and reliability risk.

5. Tell me about a time you worked with another trade to solve a problem.

Background: Marine Corps utilities or maintenance technician

Situation:
A cooling unit was tripping intermittently, and the mechanical team initially suspected a refrigerant issue. The trips did not line up with normal load changes.

Task:
I needed to help troubleshoot without assuming it was only a mechanical failure.

Action:
I gathered the times of the trips, operating readings and alarm history. Then I worked with an electrical technician to compare the trips with power and control events. We found a loose control connection that caused intermittent shutdowns. I stayed with the system during restart and verified cooling performance after the electrical repair.

Result:
The team fixed the actual problem instead of chasing refrigerant readings. It reinforced the value of sharing data between trades.

6. Tell me about a time you responded to an urgent alarm.

Background: Navy engineering or Coast Guard machinery technician

Situation:
During a shift, we received an alarm indicating abnormal temperature on a critical support system. The equipment was still operating, but the trend was moving the wrong direction.

Task:
My job was to respond quickly, communicate status and help prevent equipment damage.

Action:
I notified the watch lead, checked the local indication and compared it with the control display. I inspected for flow problems, abnormal noise and valve position. We shifted load to available standby equipment using the approved procedure and continued monitoring until temperatures stabilized. I documented the timeline and readings for maintenance follow-up.

Result:
The system stayed online, and maintenance later found a developing flow restriction. The early response prevented a more serious failure.

7. Tell me about a time you improved a maintenance process.

Background: Civilian industrial maintenance mechanic

Situation:
At an industrial facility, several pump PMs were being completed, but the notes were inconsistent. It was hard to tell whether vibration or seal leakage was getting worse over time.

Task:
I wanted to make the PMs more useful without adding unnecessary complexity.

Action:
I suggested a simple checklist format that included suction and discharge readings, vibration observations, seal condition, bearing temperature and any unusual noise. I reviewed it with the lead and used it on my assigned PMs. I also made sure comments were written in plain language.

Result:
The team had better trend information and could spot repeat issues faster. It also made shift

turnover easier because the work orders contained useful field data.

8. Tell me about a time you had to communicate bad news.

Background: Army power generation or utilities technician

Situation:
A standby unit failed a readiness check before a planned maintenance window. The schedule was tight, and people expected the work to proceed.

Task:
I had to report the issue accurately and support the decision on whether to continue.

Action:
I verified the failed condition, checked the basic items I was authorized to inspect and documented the symptoms. I told the supervisor that the standby unit was not available and that proceeding would reduce redundancy. I recommended postponing the maintenance until the standby unit was restored or a revised risk plan was approved.

Result:
The maintenance window was delayed, which was not popular, but the team avoided working without the expected backup. The failed standby unit was repaired before the work was rescheduled.

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8. How to translate military or other trade experience

Many candidates have strong experience but describe it in a way that civilian hiring managers do not immediately understand. Your job is to translate your background into facility outcomes.

Focus on:

- Systems operated
- Equipment maintained
- Safety procedures followed

- Logs and rounds completed
- Watchstanding or shift operations
- Emergency response
- Preventive maintenance
- Troubleshooting
- Team communication
- Training and qualification

Use plain civilian language

Instead of:

> “I stood watch in main control and qualified on multiple watchstations.”

Say:

> “I operated mechanical and utility systems on shift, monitored alarms and logs, followed written procedures and escalated abnormal conditions.”

Instead of:

> “I was responsible for QA tags and maintenance packages.”

Say:

> “I followed formal maintenance procedures, verified isolation points, documented work and supported return-to-service checks.”

Instead of:

> “I maintained mission equipment in a deployed environment.”

Say:

> “I maintained critical support equipment in a high-reliability environment where downtime affected operations.”

Examples from military backgrounds

Army utilities, power generation or HVAC

Relevant experience may include:

- Generators and support systems
- HVAC equipment
- Field utilities
- Preventive maintenance
- Fuel, water or environmental systems
- Troubleshooting under time pressure
- Safety and technical manuals

How to phrase it:

> “I maintained utility equipment, performed scheduled PMs, responded to alarms and used technical manuals to troubleshoot mechanical and electrical support systems.”

Air Force HVAC, power production, civil engineering or facilities

Relevant experience may include:

- Base facilities
- Chillers or air handlers
- Environmental control units
- Work orders
- Mission-support buildings
- Shift response

How to phrase it:

> “I supported HVAC and facility systems for mission-critical buildings, completed work orders, followed safety procedures and coordinated with other shops during outages or alarms.”

Navy engineering, Seabees, aviation support or nuclear-trained sailors

Relevant experience may include:

- Watchstanding
- Pumps, valves, heat exchangers and chillers
- Logs and rounds
- Formal procedures
- LOTO or tagout
- Maintenance documentation
- Plant operations

How to phrase it:

> “I operated and maintained mechanical plant systems, including pumps, valves and heat exchangers, using formal procedures, logs and shift turnover. I am comfortable working in a controlled environment where equipment status and communication are critical.”

Marine Corps utilities, refrigeration, aviation ground support or maintenance

Relevant experience may include:

- HVAC/refrigeration equipment
- Field power and utilities
- Maintenance under operational pressure
- Technical manuals
- Cross-trade coordination

How to phrase it:

> “I maintained mechanical and utility systems that supported operations, diagnosed equipment faults, coordinated with other technicians and documented corrective actions.”

Coast Guard machinery technician, electrician’s mate or facilities support

Relevant experience may include:

- Pumps, compressors and auxiliary systems
- Preventive maintenance
- Emergency response
- Watchstanding
- Small-team operations

How to phrase it:

> “I operated and maintained auxiliary mechanical systems, responded to equipment alarms and worked in small teams where accurate communication and safe isolation were important.”

Space Force facilities, power, HVAC or mission support

Relevant experience may include:

- Mission facilities
- Facility monitoring
- Critical support systems
- Coordination with operations teams
- Procedure compliance

How to phrase it:

> “I supported facility systems for mission operations, monitored equipment status, followed work control processes and communicated system conditions during maintenance.”

Examples from civilian trades

Commercial HVAC technician

Translate:

- Rooftop units
- Split systems
- Chillers
- Boilers
- Controls
- Refrigerant handling
- Customer communication
- Service calls

Data center phrasing:

> “I troubleshoot cooling systems from the symptom back to airflow, refrigerant, water flow, controls or maintenance condition. I am used to documenting findings and explaining risk before making repairs.”

Stationary engineer or central plant operator

Translate:

- Chillers
- Boilers
- Pumps
- Towers
- Logs
- Water treatment
- Shift operations

Data center phrasing:

> “I have operated central plant equipment on shift, monitored trends and rounds, performed PMs and responded to abnormal conditions while maintaining service to the building.”

Industrial maintenance mechanic or millwright

Translate:

- Pumps
- Motors
- Bearings
- Vibration
- Alignment
- Lubrication
- Preventive maintenance
- Corrective repair

Data center phrasing:

> “I bring strong rotating-equipment troubleshooting, PM discipline and mechanical repair experience. I understand that in a critical facility, I need to combine that with change control and system impact awareness.”

Plumber or pipefitter

Translate:

- Hydronic piping
- Valves
- Pumps
- Leak repair
- Pressure testing
- Isolation
- Drawings

Data center phrasing:

> “I understand piping systems, valve lineups, pressure boundaries and leak response. In a data center, I would apply that experience with extra attention to redundancy, water near electrical equipment and approved isolation procedures.”

Controls or BAS technician

Translate:

- Sensors
- Actuators
- Trends
- Alarms
- Sequences
- Calibration
- Networked controls

Data center phrasing:

> “I can use alarms and trends to understand system behavior, but I also verify field conditions. I know a control point can be wrong, so I compare command, feedback and actual equipment response.”

Use O*NET Military Crosswalk

The U.S. Department of Labor’s O*NET Military Crosswalk can help translate military occupation codes into civilian job families. It is not a perfect match for every role, but it can give you civilian keywords for resumes and interviews.

Use it to identify terms like:

- Heating, air conditioning and refrigeration mechanics
- Stationary engineers
- Maintenance and repair workers
- Power plant operators

- Electrical and electronics repairers
- Industrial machinery mechanics

Then adapt the language to your actual experience. Do not claim systems you have not worked on.

If you are still serving, the Department of Labor's Transition Assistance Program (TAP) covers resumes, job search and interviewing (Source 7).

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9. Study plan and checklist

Suggested interview study plan

Days 1-2: Understand the role

Study:

- What data centers and critical facilities do
- Mechanical technician responsibilities
- Shift work and handoffs
- Redundancy terms: N, N+1, 2N
- SOP, MOP and EOP basics
- Change management

Practice answering:

- “Why do you want to work in a data center?”
- “What does uptime mean to you?”
- “How do you work safely in a live facility?”

Days 3-4: Review refrigeration fundamentals

Study:

- Compressor, condenser, metering device, evaporator

- Superheat and subcooling concepts
- Refrigerant states and heat transfer
- Refrigerant safety
- EPA Section 608 basics
- Recovery and no venting
- Leak-repair awareness and recordkeeping basics

Practice answering:

- “Explain the refrigeration cycle.”
- “What do superheat and subcooling tell you?”
- “What would you do if you suspected a refrigerant leak?”

Days 5-6: Review chilled water and central plants

Study:

- Chillers
- Chilled-water loop
- Condenser-water loop
- Cooling towers
- Pumps
- Strainers
- Expansion tanks
- Valves and actuators
- VFDs
- Approach temperature as a concept

Practice drawing:

- A simple chilled-water loop
- A water-cooled chiller with tower loop
- A pump with suction and discharge components

Days 7-8: Review data center cooling and airflow

Study:

- CRAH vs CRAC
- Hot aisle/cold aisle
- Containment
- Bypass air
- Recirculation
- Delta T
- Humidity and dew point
- In-row cooling
- Rear-door heat exchangers
- Liquid cooling and CDUs at a general level
- ASHRAE thermal guidance at a general level

Practice answering:

- “Why is airflow management important?”
- “How would you find recirculation?”
- “What is different about cooling a data hall versus a comfort space?”

Days 9-10: Review controls, alarms and maintenance

Study:

- BMS/BAS alarms
- Trending
- Setpoints
- Sensor verification
- Water leak detection alarms
- Spot, pan and cable leak sensors at a general level
- CMMS work orders
- PM, predictive maintenance and corrective maintenance
- Vibration, thermography and oil analysis
- Rounds and logs

Practice answering:

- “How do you use trends?”
- “What makes a good work-order closeout?”
- “How do you know whether a sensor is wrong?”
- “How would you respond to a water leak detection alarm?”

Days 11-12: Review safety

Study:

- LOTO under OSHA hazardous energy rules
- Stored energy
- Electrical safety awareness
- Qualified-person boundaries
- Refrigerant safety
- Confined space awareness
- Water leaks near electrical equipment
- Fire suppression awareness
- PPE and escalation

Practice answering:

- “Tell me how you lock out equipment.”
- “What do you do if the procedure does not match the field condition?”
- “Would you reset a tripped chiller?”

Day 13: Practice scenarios

Use the scenarios in this guide.

Practice out loud:

- CRAH discharge temperature rising
- Pump cavitation
- Chiller trip
- Tower performance issue

- Water leak alarm
- Bad sensor or control issue

Use this format:

1. Safety
2. Protect the load
3. Check alarms and trends
4. Verify locally
5. Diagnose system path
6. Follow procedure
7. Communicate and document

Day 14: Mock interview and final review

Prepare:

- Concise background summary
- Three technical stories
- Three safety stories
- Three teamwork stories
- Questions for the interviewer
- Resume copy
- Certification list, if applicable
- Shift availability

Do a mock interview with a friend, recruiter or mentor if possible.

Day-before checklist

- Review the job description.
- Know the systems mentioned in the posting.
- Prepare your concise introduction.
- Prepare several STAR examples.
- Review refrigeration and chilled-water basics.

- Review LOTO and electrical safety talking points.
- Review EPA Section 608 basics if refrigerant work is relevant.
- Confirm interview time, location or video link.
- Plan travel or test video/audio.
- Bring copies of your resume if in person.
- Bring a notebook and pen.
- Prepare several job-related questions.
- Get rest and avoid cramming late.

General study topics

- Refrigeration cycle
- Chillers and central plants
- Cooling towers and water treatment awareness
- Pumps, valves, VFDs and hydronic systems
- Data center airflow
- Humidity and dew point
- Economizers
- BMS/BAS trends and alarms
- Water leak detection and response
- CMMS documentation
- Maintenance strategies
- Redundancy and change management
- LOTO and electrical safety
- Refrigerant compliance and safety
- Confined space awareness

Certifications

Certifications are separate from this guide. Some are voluntary and may help show commitment or knowledge, depending on the role and employer.

EPA Section 608 certification is required to purchase covered refrigerants and to maintain, service, repair, or dispose of covered stationary AC/R appliances where refrigerant could be released. The certification types are Type I, Type II, Type III and Universal. Always check current EPA rules.

This guide is not an official exam prep course for any certification.

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10. Questions to ask the interviewer

Ask job-related questions that help you understand the role and expectations.

Good questions include:

1. What mechanical systems would this role support most often?
2. Is the site primarily chilled water, DX cooling or a mix?
3. How are shifts structured, and how is turnover handled?
4. What does the team expect from a technician during the initial onboarding period?
5. How does the site manage MOPs, SOPs, EOPs and change control?
6. What are the most common mechanical alarms or failure modes at this facility?
7. How are PMs, rounds and corrective work documented?
8. How does the team train technicians on site-specific systems?
9. What work is handled in-house versus by specialty contractors?
0. How does the team communicate during maintenance windows or abnormal events?
1. What safety qualifications or site authorizations are required before working independently?
2. What qualities make a technician successful on this team?

Avoid questions about protected traits or personal characteristics of the team. Keep questions focused on the work, schedule, training, safety, systems and expectations. The EEOC explains which employment practices are prohibited (Source 8).

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11. Key terms glossary

Air-side economizer: A system that uses suitable outdoor air conditions to reduce mechanical cooling.

Approach temperature: How close a leaving fluid temperature gets to its reference temperature; for a cooling tower, leaving water temperature minus outdoor wet-bulb temperature. A worsening approach can point to fouling, flow or control problems.

ASHRAE thermal guidelines: Industry guidance commonly used to help define acceptable environmental conditions for IT equipment; check current guidance and site requirements.

BAS/BMS: Building automation system / building management system; many organizations use these terms interchangeably for the control system that monitors alarms, trends, status, setpoints and control points.

Blowdown: Controlled removal of water from a tower or water system to manage dissolved solids.

Bypass air: Supply air that returns to cooling equipment without cooling the intended load.

Cavitation: Formation and collapse of vapor bubbles in a pump due to poor suction conditions or other causes.

CDU: Coolant distribution unit used in liquid cooling systems to manage flow and heat transfer.

Chilled-water loop: Piping loop that carries chilled water from chillers to cooling loads and returns warmer water.

Chiller: Mechanical equipment that removes heat from a water loop.

CMMS: Computerized maintenance management system for work orders, PMs and maintenance history.

Cold aisle: A data center aisle where cooled supply air is delivered to IT equipment intakes.

Condenser: Part of a refrigeration system where heat is rejected from refrigerant.

Condenser-water loop: Water loop that carries heat from a water-cooled chiller to heat rejection equipment such as cooling towers.

Containment: Barriers or layouts used to separate hot and cold air streams.

Cooling tower: Heat rejection equipment that uses evaporative cooling to remove heat from condenser water.

Corrective maintenance: Work performed to repair equipment that has failed or is not operating correctly.

CRAC: Computer room air conditioner using a direct-expansion refrigerant circuit.

CRAH: Computer room air handler using chilled water for cooling.

Delta T: Temperature difference between two points, such as supply and return air or water.

Dew point: Temperature where moisture in air begins to condense.

EOP: Emergency operating procedure for abnormal or emergency conditions.

EPA Section 608: U.S. EPA refrigerant rules covering technician certification, venting prohibition, recovery and certain leak-repair requirements.

Evaporator: Part of a refrigeration system where refrigerant absorbs heat.

Hot aisle: A data center aisle where server exhaust air is directed.

In-row cooling: Cooling equipment located close to IT racks, often within or adjacent to rack rows.

Leak detection cable: Sensing cable placed in areas where water leaks may occur, often connected to local alarms or a BMS/BAS.

LOTO: Lockout/tagout process for controlling hazardous energy during servicing or maintenance.

Makeup water: Water added to replace losses from evaporation, blowdown or leaks.

Metering device: Refrigeration component that reduces refrigerant pressure before the evaporator.

MOP: Method of procedure for planned work, usually with step-by-step instructions and risk controls.

N: The amount of equipment required to support the load.

N+1: Required equipment plus one additional unit, path or component.

NPSH: Net positive suction head; the suction head available above the liquid's vapor pressure, compared with the pump's required NPSH to avoid cavitation.

Predictive maintenance: Maintenance based on condition indicators such as vibration, thermography, oil analysis or trends.

Preventive maintenance: Scheduled maintenance intended to reduce failures.

Rear-door heat exchanger: Rack-mounted heat exchanger that removes heat from server exhaust air near the rack.

Recirculation: Hot exhaust air returning to equipment intakes.

Redundancy: Extra capacity or alternate paths that help maintain operation during maintenance or failure.

Rounds: Routine operator inspections and readings.

Setpoint: Target value used by controls, such as temperature or pressure.

SOP: Standard operating procedure for normal or routine tasks.

Spot leak sensor: A localized water detector placed at a specific leak-risk point, such as near a drain pan or piping area.

Subcooling: How far liquid refrigerant has been cooled below its saturation (condensing) temperature at its current pressure.

Superheat: How far refrigerant vapor has been heated above its saturation (boiling) temperature at its current pressure.

VFD: Variable frequency drive used to control motor speed.

Water leak detection system: Sensors and alarm points used to detect water where it should not be, especially near critical equipment.

Water-side economizer: System that uses favorable outdoor conditions through a water loop or heat exchanger to reduce mechanical cooling.

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12. Sources and further reading

1. OSHA, The Control of Hazardous Energy (Lockout/Tagout), 29 CFR 1910.147: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.147
2. OSHA, Control of Hazardous Energy topic page: https://www.osha.gov/control-hazardous-energy
3. OSHA, Electrical safety topic page: https://www.osha.gov/electrical
4. OSHA, Selection and use of work practices, 29 CFR 1910.333: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.333
5. NFPA 70E, Standard for Electrical Safety in the Workplace: https://www.nfpa.org/codes-and-standards/nfpa-70e-standard-development/70e
6. O*NET OnLine, Military Crosswalk (U.S. Department of Labor): https://www.onetonline.org/crosswalk/MOC/
7. U.S. Department of Labor VETS, Transition Assistance Program: https://www.dol.gov/agencies/vets/programs/tap
8. U.S. EEOC, Prohibited Employment Policies/Practices: https://www.eeoc.gov/prohibited-practices
9. U.S. EPA, Section 608 of the Clean Air Act (Stationary Refrigeration and Air Conditioning): https://www.epa.gov/section608
0. U.S. EPA, Section 608 Technician Certification: https://www.epa.gov/section608/section-608-technician-certification-0
1. U.S. EPA, Stationary Refrigeration Leak Repair Requirements: https://www.epa.gov/section608/stationary-refrigeration-leak-repair-requirements

2. U.S. Bureau of Labor Statistics, Occupational Outlook Handbook: Heating, Air Conditioning, and Refrigeration Mechanics and Installers: https://www.bls.gov/ooh/installation-maintenance-and-repair/heating-air-conditioning-and-refrigeration-mechanics-and-installers.htm

13. Disclaimer

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14. Next step

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