

Eliminating \$250k in Annual Repair Costs with VRF Replacement



Variable Refrigerant Flow (VRF) systems use refrigerant to heat and cool a building's individual zones. Unlike traditional systems, VRF uses an inverter to modulate the compressor's speed, enabling precise temperature control and improved energy efficiency. When properly installed, VRF systems deliver significant energy savings, flexibility, and improved comfort. However, improper installation can result in excessive repair costs.

This case study profiles how an Illinois school district worked with PremiStar to replace a ten-year-old improperly installed VRF system with a chilled water system and thermal storage unit to optimize energy efficiency, reduce operating costs, and reduce total project costs through utility rebates and incentives.

System Design



In 2023, after completing another major project with the school system, the facilities team and PremiStar discussed adding a geothermal storage system to replace the existing VRF system, which was nearing the end of its warranty; however, the costs were too high. In 2025, the district sought a more cost-effective solution. In response, PremiStar partnered with a leading OEM to propose combining a new chilled water system with a thermalized storage unit.

Replacing the improperly installed VRF system with a chilled water system and thermal storage offered several advantages, including increased energy efficiency, lower operating costs, and reduced maintenance requirements. The thermal storage unit allows the chiller to operate during off-peak hours, storing chilled water for use when demand is high, further reducing costs and electrical load. This combination provides greater capacity, energy flexibility, and qualifies for utility company energy rebates, thereby optimizing energy efficiency and reducing total project costs. The system design was approved, and the project moved to the contracting phase.

Contracting Process



The school facilities and operations team leveraged their membership in the OMNIA Partners procurement network to achieve bid-free, compliant procurement with the OEM and PremiStar. This process eliminated the need for time-consuming RFPs with multiple vendors and ensured rigorous third-party verification for compliance with fair-market pricing.

Customer Benefits



Installation of the new chilled water system and thermal storage unit resulted in the following benefits for the school:

- **Maintenance & Repair Savings:** Eliminated approximately \$250,000 in annual operating expenses.
- **Energy Efficiency:** The combination of the chilled water system and the thermal storage unit is expected to result in a 50% improvement in energy efficiency.
- **Streamlined, Compliant Procurement:** Managing procurement and contracting through the district's OMNIA Partners membership eliminated the time-consuming process of issuing multiple RFPs, enabling the district to work with its preferred partners.
- **Compressed Schedule:** The entire replacement and upgrade project involved completing 5,000 hours of work over a compressed six-week schedule. Testing and commissioning were finished in time for the school to reopen in August without issue.
- **Project Cost & ROI:** Utility rebates reduced the total project cost by 35%, with an estimated 5-year payback period.

Key Takeaways

The installation and integration of complex, energy-efficient systems requires specialized expertise beyond standard HVAC system installation. Working with a certified mechanical contracting company that has references for completing similar projects is essential. Minor errors in the installation, integration, and commissioning process can be costly over the system's lifespan. Securing rebates and incentives from utility providers requires a thorough understanding and adherence to the requirements and approval processes for each utility. Membership in a group procurement network, such as OMNIA Partners, can streamline the procurement process and ensure compliant, third-party validation of fair market pricing.

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Services We Offer <ul style="list-style-type: none"> Operational Assessment Preventative Maintenance Corrective Maintenance Repair and Replacement 24x7 Emergency Response Plumbing Service Sheet Metal & Pipefitting Energy Efficiency Programs Capital Planning Warranty Management Utility Rebate Assistance 	HVAC and Controls Equipment Supported <ul style="list-style-type: none"> Centrifugal, Screw, and Reciprocating Chillers Process and Environmental Chillers Gas, Steam, and Hot Water Boilers Computer Room AC Systems Pneumatic & DDC Control Systems Rooftop Package Units Ventilation Systems Refrigeration Systems Air Balancing Cooling Towers Pump Packages 	Program Benefits <ul style="list-style-type: none"> Lower operating and life-cycle costs Increased energy efficiency and lower carbon emissions Greater occupant comfort Enhanced equipment uptime and reliability Longer asset life Improved budgeting and capital planning 		

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