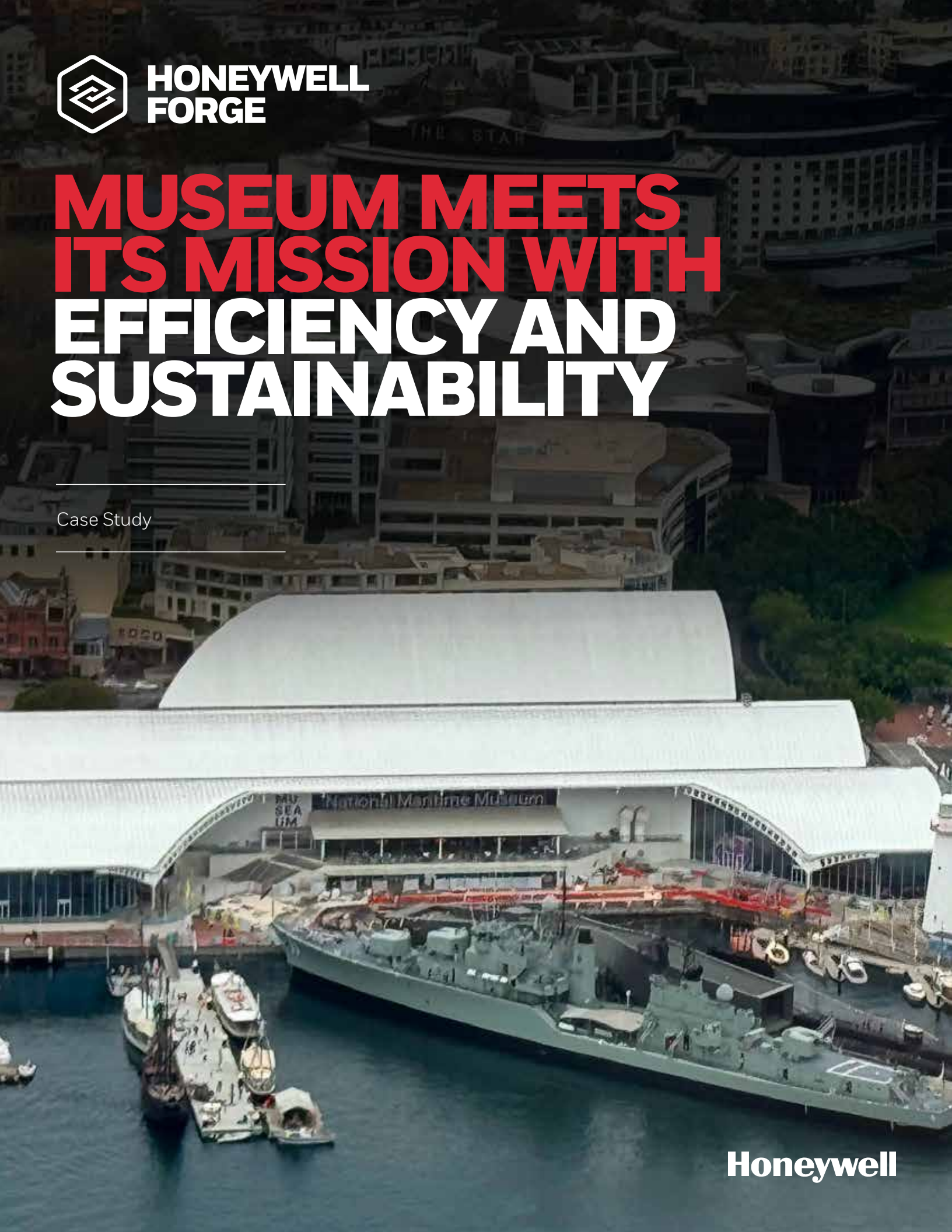
HONEYWELL FORGE

MUSEUM MEETS ITS MISSION WITH EFFICIENCY AND SUSTAINABILITY

Case Study



Honeywell

The Australian National Maritime Museum (ANMM) is a landmark cultural institution dedicated to maritime collections, exhibitions, experiences and knowledge. Built in 1991, the facility was originally designed as an exhibition space only. Today, the museum welcomes more than 850,000 national and global visitors annually to immerse themselves in Australian maritime heritage in contemporary ways.

ANMM is responsible for acquiring and archiving objects of important national significance that illuminate the value Australia places on its marine estate. The museum began collecting maritime artifacts long before it opened its doors in 1991. Now the museum collection contains more than 160,000 objects ranging from 400 ship models, manuscript logs, maps, ship portraits, Indigenous artefacts and more. As the facility was designed as an exhibition space, and not a museum, the building lacked the insulation and precision HVAC design museums require for meticulous conservation and preservation work.

As the national custodian of these culturally significant objectives, the ANMM considers conservation its top priority. This is reflected in how the operational systems and environmental conditions of the museum have been upgraded to preserve the priceless artifacts on display and in storage on-site. Maintaining the right environmental conditions, aligned to the guidelines of the Australian Institute for Conservation of Cultural Material (AICCM) within the museum is required for the preservation of its artifacts. Fluctuations in temperature and humidity can accelerate the deterioration of materials through chemical reactions, mold growth, and physical deformation. High temperatures can speed up chemical degradation, or aging, while inappropriate humidity levels due to the museum's waterfront location can cause materials like wood to crack or warp and metals to corrode. Therefore, a stable environment is essential, making the performance and reliability of the HVAC system critical to safeguarding these valuable collections.

The ANMM has implemented various sustainability initiatives to enhance the performance of its assets and reduce energy consumption, contributing to both cost reduction and ESG goals:

- **Energy Efficiency:** Installed 235kW solar panel system on the roof of Wharf 7, reducing reliance on grid electricity and lowering greenhouse gas emissions.
- **HVAC System Transition:** Shifted from sea water to a cooling tower heat-rejection system, resulting in improved energy and water usage efficiency.
- **LED Lighting Upgrades:** Upgraded to energy efficient LED lighting across the facility, significantly reducing electricity consumption.
- **Water Conservation:** Implemented water-saving devices and fixtures, leading to a substantial reduction in water usage.

THE OPPORTUNITY

The challenge of heating, cooling and controlling the facility's environment stems from several factors:

- **Waterfront Location:** The proximity to the harbor introduces varying humidity and temperature conditions that need constant regulation to preserve exhibits.
- **Diverse Spaces:** The museum encompasses different types of spaces, including enclosed galleries, open exhibition areas, and outdoor exhibits, each requiring specific climate control solutions.
- **Historic Vessels:** The preservation of historic vessels and maritime artifacts demands precise and stable environmental conditions to prevent deterioration.

To uphold the environmental conditions required for conservation of the objects within the ANMM, the facility relies on the performance of mechanical assets such as cooling towers, chillers, chilled and condenser water pumps, and cooling fans. These were primarily maintained with a planned maintenance schedule, but frequent recurring issues resulted in repetitive reactive fixes. The Honeywell team worked with the ANMM to better understand the health of these large critical mechanical assets to better predict lifecycle and performance.

THE SOLUTION

By expanding the use of **Honeywell Forge Performance+ for Buildings | Predictive Maintenance**, to include the new asset reliability IoT sensors and artificial intelligence and machine learning capabilities, the ANMM prioritized cooling towers and hot and cold chilled water pumps to focus attention.

The deployment of the IoT sensors was completed within hours, thanks to the strong cellular network connection within the ANMM and vast open spaces within its built environment. The analytical intelligence within the solution required up to two weeks to learn the operational parameters of the mechanical assets, and shortly thereafter, provided insights on the potential operational abnormalities of the chilled water pumps and cooling towers.

The deployment further supported the museum's sustainability commitment:

- **Energy-Saving Technologies:** Adopting advance energy-saving technologies has resulted in a notable decrease in electricity consumption and operational costs.
- **Environmental Impact Reduction:** Applying continuous efforts to implement environmentally friendly practices have reduced the museum's carbon footprint and supported broader environmental sustainability goals.
- **Enhanced Visitor Experience:** Improving its infrastructure and amenities, combined with strategic planning and innovative programming, have elevated the overall visitor experience and engagement.

THE OUTCOME

Within weeks, the initial focus identified performance challenges with the cooling tower. Further exploration by the Honeywell Services team identified a cracked frame. Had this issue not been identified by the asset reliability sensor, the escalation of the cracked frame could have resulted in a catastrophic failure of mechanical equipment, costing the ANMM resources, energy and ultimately put the artifacts at risk.

The Australian National Maritime Museum's operational strategies and sustainability initiatives demonstrate a strong alignment with its mission to preserve maritime heritage, enhance visitor engagement, and contribute to environmental sustainability.

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