



PROJECT SUMMARY:



CLIENT:
Tayside Health Board

PROJECT:
Ninewells Hospital, Perth
Royal Infirmary and
Stracathro Hospital

TIMESCALE:
Sept 2015 - March 2017
+ 25 years operation and
maintenance

THE BENEFITS:

- > Guaranteed annual financial savings of £2.6m which NHS Tayside will use to fund the project, and operation and maintenance costs
- > Estimated CO2 savings of 287,000 tonnes over 25 years
- > Dedicated engineers and a visiting contracts manager for the duration of the O&M period providing planned and reactive services
- > Lighting upgrades will result in annual energy savings of over 4.99 million kilowatt hours

PROJECT OVERVIEW

Tayside Health Board oversees the healthcare services in Angus, Dundee and Perth and Kinross, which employs around 14,000 workers and provides healthcare for a population of around 415,000. The estate includes three major hospitals (Ninewells, Perth Royal Infirmary, Stracathro), numerous community hospitals, 60 GP surgeries and a variety of health centres.

The Health Board wished to make substantial upgrades to the infrastructure at Ninewells Hospital including a new Combined Heat & Power engine (CHP)

and upgrades to associated plant and equipment, the chilling system, the building management system (BMS) and lighting. Perth Royal Infirmary benefited from lighting upgrades and other site improvements, with lighting upgrades being installed at Stracathro Hospital. Tayside Health Board wanted to invest in significant energy upgrades to provide a resilient energy supply to reduce energy costs and carbon emissions, and reduce maintenance backlog.

VITAL'S SOLUTION

The Health Board procured the project through the Carbon & Energy Fund. In addition to designing and installing the low-carbon energy system, we are providing a comprehensive asset management service including operation, maintenance and lifecycle over the next 25 years. The project is underpinned with an Energy Performance Contract, which guarantees financial savings and carbon targets.

We proposed a solution, which included both an energy generation solution, and energy reduction measures to maximise

carbon reductions and financial savings. Our solution included lighting upgrades in all three hospitals, an upgraded BMS control system, an updated energy centre and insulation upgrades.

Largest lighting upgrade to take place in a fully operational hospital, saving 2,000 tonnes of CO2 per year

The major energy upgrades at Ninewells Hospital required 17,233 light fittings to be replaced with high efficiency LED units, which is the largest lighting upgrade to take place in a fully-operational hospital.

▶ The scheme will see us deliver guaranteed financial and carbon savings for the Health Board.



The energy solution has successfully exceeded financial expectations by over 32% after its first year of operation.

We upgraded 4,080 light fittings and made insulation improvements at Perth Royal Infirmary, and upgraded 382 light fittings at Stracathro Hospital.

New heat and power generation equipment and upgrades to the BMS increase the efficiency of the system

The energy generation solution includes a 4MWe CHP engine, a 9MW dual fuel combined waste heat recovery/fired boiler, an 8MW dual fuel packaged steam boiler, three 500kWe high efficiency chillers, and upgrades to the condensate system. The waste heat from the CHP engine will preheat low temperature hot water and domestic hot water plate exchangers in 5 plantrooms, providing space heating and domestic hot water to a number of areas. Additionally, we have removed the existing hotwells and boiler feedwater pumps on the ground floor of the boiler house and replaced them with two new hotwells and associated feedwater pumps on the first floor. We replaced the BMS control system with modern devices and are carrying out ongoing works to optimise the performance.

Engaging clients project team by demonstrating the quality of our supply chain

We visited the Jenbacher factory in Innsbruck, Austria, to give the clients' consultants the opportunity to witness first hand that the CHP engine could provide the 4MW electrical generation and 90°C recoverable heat requirements. We were also given a tour of the factory to see the production and manufacturing process, highlighting the quality and excellence required from our suppliers and subcontractors.

Great client relationship aided by continuous communication

To ensure minimum disruption to critical services, we kept the client well informed on a daily basis. We delivered presentations to brief staff about planned works, maintained communication with individual departments, and worked out of hours and at weekends.

One of the largest chimney refurbishments Vital have ever undertaken

We created three temporary chimneys while upgrades to the flue took place. The refurbishment included removing six existing flues and installing five new internal flues into the existing 56m tall concrete windshield, upgrading the earthing system including the lightning protection system, and repainting the smoke band. Due to space restrictions,

the mobile crane we used needed to be situated in the laundry yard which serves the whole of NHS Tayside. We delivered presentations to brief NHS Tayside staff about the re-organising of the laundry yard, including the building of a temporary platform for the loading bay which allowed the laundry to remain operational.

Operation and Maintenance services for the next 25 years

Three local engineers operate and maintain the plant equipment, including over 1km of steam pipework running beneath the main corridor of Ninewells Hospital. The team are supported by Performance Engineers, BMS Engineers, and Business Support from our Blackburn headquarters and are responsible for preparing the data submission for CHPQA compliance, which allows savings to be made on the gas used by the CHP and boilers.

Our Contracts Manager attends regular operational meetings to review the performance of the equipment and works with the Health Board to ensure optimum operation and savings.

We have successfully completed the first year of operational services whereby the performance exceeded annual targets and generated significant energy and carbon savings.