



## Ministry of Defence (MOD)

### RAF SPADEADAM

Spadeadam is a Ministry of Defence base for the Royal Air Force (RAF), sited in Cumbria. This substantial base is located in a remote area and the MOD identified it as a site that would greatly benefit from a carbon reduction scheme as it is off-gas.

As part of a wider defence estates implementation of carbon reduction, the project consultant specified a biomass solution to heat a district heating system serving a hangar and a number of office buildings. It was necessary to provide a medium temperature hot water system that would supply heat at 100°C and hot water to these buildings.

The client identified a local wood supplier with the aim of being able to maximise the potential of the surrounding woodland. This, alongside the sustainable nature of biomass, would reduce CO<sub>2</sub> emissions in the delivery process.

This shows that not only the final renewable technology system at the base was desired to have a smaller carbon footprint compared to fossil fuels, but that the impact of the process of deliveries, site works and installation of the solution was considered also.

In spring 2011, Carillion Enterprise specified Rural Energy to provide a biomass boiler and heating system that could tolerate wood chip for fuel with a moisture content of up to 50%. For this project the plant room required a system that could be engineered to fit within the redundant existing buildings on site to fully incorporate a fuel store and an automatic fuel feed system utilising a walking floor.

Rural Energy's answer was to design and install a bespoke turnkey biomass project. For this a 600kW wood chip biomass boiler with a scraper floor fuel delivery system was identified, designed, installed and commissioned.

### CASE STUDY FOCUS

Supplying  
**600kW**

Endress® VR-W

For the

**MOD**

Fuel transported by

**WALKING  
FLOOR**

### SYSTEM SUMMARY

**Boiler Type:** Endress® VR-W

**Fuel Type:** Wood chip

**Fuel Store:** Block built



## CO-OPERATIVE WORKING

This turnkey project required Rural Energy to work alongside local buildings and civils contractors. The design team also assisted with the drawing plans for refurbishment of the existing plant room and the space used for the wood chip store as our design engineers specialise in fuel store optimisation.

This solution is a complex system, particularly as it was required to meet stringent MOD standards and was retrofitted into existing structures.

## OVERCOMING CHALLENGES

The main challenge was to successfully work with other contractors to establish a fully functioning and professionally designed fuel store. As well as being retrofitted, the boiler needed to be integrated into the existing MTHW (medium temperature hot water) system on site.

Rural Energy's project management and installation teams successfully led this part of the renovation of Spadeadam's site.

The project included fitting and installing two large buffers, refurbishing an existing plant room, installing and commissioning a 600kW Endress biomass boiler and wood chip fuel store with a walking floor fuel transport solution. The walking floor moves the wood chip onto transport augers and in turn they convey the fuel into an intermediate trough. From there it travels into the plant room and to the boiler.

Rural Energy had to work as part of a wider team with the MOD and Carillion Enterprise as project leaders.

The biomass boiler has been consistently providing renewable heat with wood chip fuel since September 2011, a particularly quick turnaround considering the scope of the project.

## WORKING WITH

Main Contractor: Carillion Enterprise

M&E Contractor: Geoffrey Robinson

Consultant: Black & Veatch

