CASE STUDY

Lynemouth Power (LPL)– Provision of Operation and Maintenance Services at Port of Tyne

OVERVIEW

LPL located in Northumberland, England owns and operates a 420 MW coal fired power station and has been working with Contractors to design a technical solution for a full conversion of the power plant to run on wood pellet biomass. LPL received clearance from the European Commission on 1st December 2015 for its supporting Contract for Difference from the UK government. Post conversion, the power station will generate about 2.3 TWh of low carbon electricity per year. The power station will operate at baseload, thus providing dispatchable low-carbon electricity.

A critical element of the conversion project is the design, build and operation of a facility at the Port of Tyne that gives LPL the infrastructure to unload up to 1.8m tonnes of biomass wood pellets per annum and includes 3 storage silos totalling ~75k tonnes, a rapid rail loading system, as well as 1.4km of conveyors connecting the berth to the silos and rapid rail loaders. Hargreaves were successful in winning the contract to operate and maintain this facility, on completion of its construction.

AIMS AND OBJECTIVES

Hargreaves are responsible for the safe running of the operation at the Port of Tyne from the quay side conveyor, through the storage in the silos, the loading of the rail wagons, as well as the cleaning, upkeep, repair and maintenance of LPL's entire infrastructure at the Port.

WHAT WE DO

- Hargreaves supply personnel, plant and equipment to undertake the following activities;
- Responsibility of all safety standards within the scope of work
- Vessels discharge throughout the year
- Silo unloading
- Rail loading of up to 6 trains per day
- Provision of personnel in order to deliver and maintain the Cleaning standards of the facilities
- Routine preventative maintenance and inspections of the plant
- LPL require 100% uptime during both vessel unloading and rail loading times and all maintenance takes place outside of these operational requirements
- Proactively manage maintenance periods and keep as minimum records in line with all legal compliance and good industry practice. (Eg ATEX and DSEAR)

WHAT WE DID

Working with the DPL materials handling team and boiler engineers, Hargreaves came up with a system to transport the excavated PFA to a designated area and despatch into tanks which mixed the PFA with water. The slurrified product is then pumped into traditional cement mixer units (operated by Hargreaves) and transported to the receiving tanks at the unit area for firing into the boilers as required by DPL. Hargreaves also carry out all maintenance, spares and components for the mitigant plant and equipment. There have been several challenges with pipes blocking up and material solidifying in the process and Hargreaves have proposed a number of solutions to combat these issues, including; a flushing system introduced from the top of the mill to the dose pumps (fig.1), later extended to include the transfer pipe. This back-flushing system has meant less defects raised, and less isolations requested. We also introduced screening mesh at receiving tanks to trap oversize and prevent contaminants entering the process. (fig.2).

OUTCOME

Jointly we successfully established a low-cost materials handling solution to a potentially costly problem. Our process is still operating today following its original concept in 2016 and may well negate the need for a fixed plant solution entirely.

So far, we have achieved a significant reduction in failures of critical components within the biomass boilers, saving an estimated £85K per day when the boiler is non-operational and achieved continual supply of mitigant slurry to all biomass units when in operation.