

MVV Environment Baldovie Ltd's planned autumn shutdown has just concluded on time. Much work was completed during the 21 day outage.

Major refurbishment works were carried out along with other routine tasks. The highlights of this are below:

- Refractory on both furnaces lower walls was removed by ultra-high pressure water jetting, new anchors were installed to hold the refractory and a new coating of refractory was applied.



Figure 1 - Boiler tubes after hydro demolition, MVV staff inspecting tubes and new refractory anchors in place ready to be coated.



Figure 2 - New refractory (insulating layer) following application.

- The main chain conveyor which takes fuel to the fuel store was renewed. This conveyor chain had worn owing to the aggressive nature of the material it transports. The new chain installed should last a minimum of eighteen months.



Figure 3 - Worn chain, work inside the conveyor and new chain being installed.

- The main belt which carries fuel to the boilerhouse was replaced. The belt which was removed had been in service for over a decade.



Figure 4 - New belt being fitted

- Hammermill one's rotor (which weighs eleven tonnes) was replaced with a rotor which had been refurbished by a local engineering and fabrication company.
- The unserviceable secondary electromagnet which increases the removal efficiency for ferrous metals from 85% to 98% (in comparison to a single stage process) was removed from the top of the building, overhauled by a workshop in Falkirk and then reinstalled.



Figure 5 - Magnet reinstallation

- The economiser banks which are used to preheat the water before it enters the furnace were thoroughly cleaned by high pressure water jetting and inspected for any wear. Any weak areas found were repaired.



Figure 6 - Heat exchanger bundles after cleaning

- The heat exchangers which preheat the combustion air were washed through by MVV's waste attendants.



Figure 7 - MVV Waste Attendant inspecting air preheater

- Internal fuel conveyors had their wear parts replaced to ensure continued operation. In a plant which runs twenty four hours a day, seven days a week it is essential to maintain and replace wear parts such as chains to avoid costly downtime at a later date.

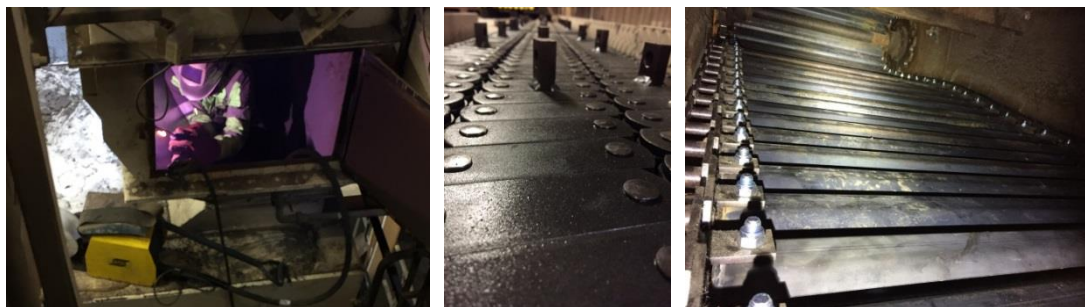


Figure 8 – MVV fitter welding a feed hopper, new chain before installation and an internal fuel conveyor with wear parts replaced.

- Additional pipework was installed to enable the boilers to be filled from different water supplies which will aid maintenance works in future.



- Both cooling water non-return valves were removed and overhauled off site by a company based in Inverkeithing before being craned back in.

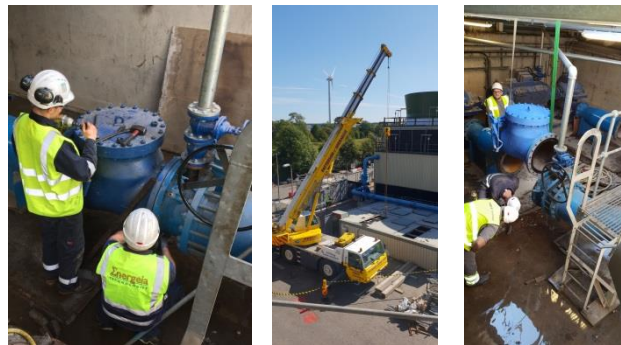


Figure 9 - (from left to right) Valve removal followed by reinstallation

- The flue gas treatment plant was thoroughly inspected and any weak areas were replaced.



Figure 10 - Access to and upgrade of the flue gas treatment plant

- The steam turbine and generator had a minor service.

- Both stacks were inspected by steeplejacks and some minor painting works were carried out at both the top and base. This ensures there is no corrosion and that the lightning conductors and earths are in good order to ensure they are in a good state to operate for another twelve months.



Figure 11 - Steeplejacks inspecting and painting a stack

- Areas of plant not accessible during normal operation were inspected by MVV staff and contractors to ensure they were in a condition suitable for continued operation. Some of these as can be seen in the below photograph are very small to fit into or need other parts of the plant removed to gain access.

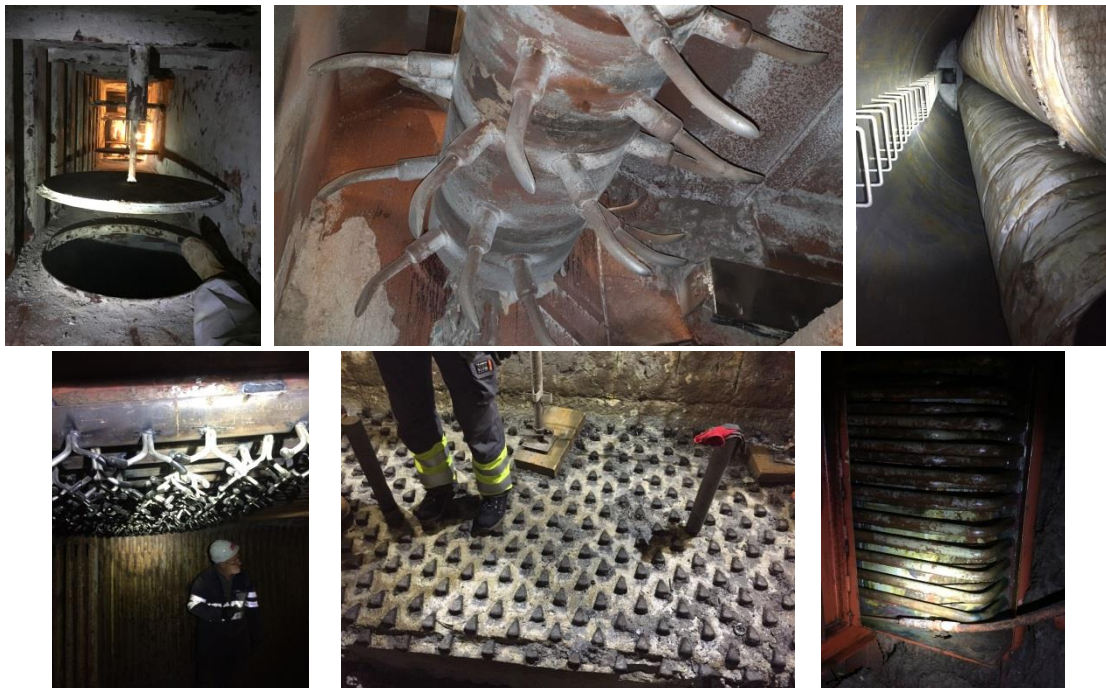


Figure 12 - Plant inspections

Both MVV team and their subcontractors put in a huge amount of time and effort to ensure that the project was completed safely and on time.

The work carried out should ensure trouble free operation of the plant until the next scheduled outage in March 2019.



**Figure 13 - Team photo of the staff and contractors remaining on site (from a peak of 90) during the final week of the shutdown**