

This report has been written to meet the requirements of Article 12 (2) of the Waste Incineration Directive 2000/76/EC(WID)

"For incineration or co-incineration plants with a nominal capacity of two tonnes or more per hour and notwithstanding Article 15(2) of Directive 96/61/EC, an annual report to be provided by the operator to the competent authority on the functioning and monitoring of the plant shall be made available to the public. This report shall, as a minimum requirement, give an account of the running of the process and the emissions into air and water compared with the emission standards in this Directive."

For any further enquiries or requests for information please contact:

Kevin Smith Utilities Manager,
UPM (UK) Limited,
Weighbridge Road,
Shotton, Deeside,
Flintshire, CH5 2LL
Direct Tel: +44 (0)1244 284393
Kevin.o.smith@upm.com

1. Introduction

2015 was the ninth operational year for Boiler 7. The principle design of the plant was to burn all the site sludge produced from the de-inking and effluent treatment processes on site. The volume of sludge being generated on site has reduced due to the permanent closure of one of the paper machine and its associated pulping equipment. Due to the low calorific value of the sludge Boiler 7 also requires support fuel for the combustion process. This support fuel is supplied as Biomass in various forms i.e. Sawmill residues, Recycled wood and Aricultural arisings. All the biomass is supplied to site by Tilhill who source the materials from various local forests and wood processors. Local authority waste wood is also prepared for use, on site, and helps sustain the boiler operation.

2. Plant description

The Boiler 7 plant comprises of the following equipment:

- Wood Bio-fuel reception and processing
- Waste Wood Processing Plant
- Site-derived waste sludge and wood bio-fuel storage;
- Conveyor systems
- Boiler 7 furnace with steam turbine and other associated equipment

Control of the combustion process remains highly automated with several layers of safeguards and interlocks built into the control strategy and hardware to ensure the operation is stable and conforms fully to the WID requirements.

The use of the combustion optimisation package has continued to be used effectively ensuring that combustion remains stable and maintain a good thermal efficiency.

3. Summary of Plant Operations

During the year the plant was operational for 7774 hours, with outages of 986 hours giving an overall availability of 88.74%

The planned boiler outage took place in April, in addition there have also been 2 unplanned shutdowns in September and December due to leaks within the Hybex beam.

APC residues and bottom ash continue to be classified as hazardous and continue to leave site as such for recycling or disposal.

Fuel Inputs

Fuel description	EWC code	Tonnes used
Wood bio-fuel	N/A	94289
Site Waste Sludge	03 03 05	119841
Recovered bio-fuel	15 01 03 17 02 01 19 12 07 19 12 10 20 01 38	120796

Energy outputs

Description	Energy MWh	End Use
Electricity	142330	Supply of a portion of the electrical energy consumption for the site.
Process steam	264333	Supplied primarily to the pulp de-inking and paper drying processes.
Process water heating	30257	Process water from the paper machines was heated through plate heat exchangers by re-circulated Flue gas scrubber shower water.

Waste outputs

Waste description	EWC code	Tonnes produced	End Use
Bottom Ash	19 01 11	5292	Hazardous waste landfill
Fly ash	19 01 13	22838	Blended with other wastes for various cement replacement products.
Fly ash	19 01 13	24096	Landfill

4. Summary of Plant Monitoring

The following air emissions from the plant were measured continuously with monthly reporting.

Carbon Monoxide (CO)
Sulphur Dioxide (SO₂)
Total Organic Carbon (TOC)
Hydrogen Chloride (HCl)
Particulates
Oxides of Nitrogen (NO_x)
Ammonia

During the year the 30 minute CO limit was exceeded on 3 occasions, the required reports have been completed

In addition to the continuous monitoring the following air emissions were measured and reported periodically (twice per year):

Mercury
Cadmium and Thallium
Other Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V)
Hydrogen Fluoride (HF)
Dioxins and Furans

The continuous emissions monitoring (CEM) equipment operated within the specified WID availability criteria throughout the year.

Results from the periodic air testing on Boiler 7 are given below:

Pollutants	Q1 results mg/m3	Q3 results mg/m3	Mean mg/m3
Mercury	0.0001	0.0007	0.0004
Cadmium & Thallium	0.002	0.0028	0.0024
Tin, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel, Vanadium	0.13	0.25	0.19
HF	0.13	0.26	0.195
Dioxins / Furans (ITEQ)	0.008	0.0033	0.0056

The ash residues produced by the process were also subject to a rigorous monitoring regime with analysis carried out quarterly for the following parameters:

Bottom Ash Weight loss on Ignition (LOI) as %
Bottom Ash heavy metals
Fly Ash heavy metals
Bottom Ash Dioxins and furans
Fly Ash Dioxins and furans

Results for Weight Loss on Ignition (LOI) testing of Bottom Ash are given below

Parameter	Q1	Q2	Q3	Q4
Bottom Ash LOI %	0.2	0.2	0.2	0.2

5. Summary of Plant Compliance

Air Pollutants	EU Directive ELV (mg/Nm3)	Percentage compliance
Particulates	10	100
NO _x	200	100
SO ₂	50	100
CO	100	100
HCl	10	100
HF	1	100
Volatile organic compounds (TOC)	10	100
Mercury	0.05	100
Cadmium and thallium	0.05	100
Sum of heavy metals (Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V)	0.5	100
Dioxins + furans	0.1 x 10 ⁻⁶	100
Ammonia	No Limit (Warranty max. 5 ppm slip if in use)	N/A
CEMs operational 8746 hours		99.85

There were no periods of abnormal operation where continuous monitoring failed and periods where emissions exceeded the consented values.

Furnace combustion performance

Bottom Ash	Unit	EU Directive ELV	Percentage compliance
Loss on Ignition	%	5	100

Annual Performance Report for Boiler 7 Renewable
Energy Process at Shotton Paper during 2015

Kevin Smith Utilities Manager

Flue gas scrubber performance

Scrubber bleed water parameters	Unit	EU Directive ELV	Percentage compliance
Total solids	mg/l	45	99.4
Hg	µg/l	30	100
Cd	µg/l	50	100
Tl	µg/l	50	100
As	µg/l	150	100
Cu	µg/l	500	100
Pb	µg/l	200	100
Cr	µg/l	500	100
Ni	µg/l	500	100
Zn	µg/l	1500	100

6. Summary of Plant Improvements

Within the planned shutdown early in the year changes made to various plant to ensure continued availability the biggest change being the replacement of the Boilerbank. This also incorporated a design change, with the number of tube rows being reduced from 61 down to 31. To compensate for this loss of thermal efficiency additional passes were installed which increased the overall plant efficiency to previous levels

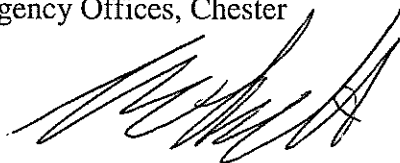
The new Wood Processing Plant was built and commissioned and has been running successfully for 10 months. This has allowed unprocessed recycled wood to be brought to site and processed to our required specification.

7. Summary of information made available:

The information made available in this report and the detailed monitoring returns from the site are available on the Public Register at:

Environment Agency Offices, Chester

Signed



Date

05th February 2016