

2.0 BP PLANT DESCRIPTION

The purposes of the BP plant are to recover salable products¹ from COG, and to clean COG sufficiently for use as fuel to heat the battery and generate steam in the boilers.

The components of the BP plant are described below. Figure 1 is a generalized process flow diagram of the BP plant.

2.1 TAR RECOVERY AND COG COOLING

COG is drawn out of the battery collector main into a slight vacuum. Two large automatic butterfly control valves in the crossover piping between the battery and the BP plant control the collector main back-pressure. One automatic butterfly control valve in the BP area controls vacuum in the crossovers. The effluent stream at this point contains COG, water vapor, flushing liquor (BH liquor), tar, and solids. Once this stream arrives at the BP plant, much of the liquor, tar and solids drop into the Tar Decanter (BH Decanter), and the COG stream continues to the gas coolers.

In the Tar Decanter, solids settle to the bottom and liquor rises above the tar. The solids are continuously scraped out of the "self-cleaning" decanter into a hopper. Liquor is taken off the top and is returned to the flushing liquor recirculation tank (BH liquor recirculation tank). Tar moves by gravity to one of two Tar Storage Tanks. One of these tanks is steam heated and the second is used as a backup. While in storage, additional dewatering of the tar occurs and this liquor is returned to the decanter.

COG is cooled in a series of two countercurrent flow spray coolers (Primary and Secondary Coolers). BH liquor is chilled in a pair of non-contact plate heat exchangers utilizing Niagara River water. Liquor and condensed material are returned to the Tar Decanter and then to the heat exchangers before returning to the coolers. A condensate collection tank is located after the secondary cooler. Liquid collected in this tank is pumped to the Tar Decanter.

This entire Section of the BP plant is under negative pressure (vacuum).

¹ At TCC, tar is the only product currently recovered for sale.

2.2 EXHAUSTERS

Suction is created and COG is moved through the BP Plant by one of three rotary blowers known as exhausters. Exhausters No. 1 and 2 are driven by electric motors, while Exhauster No. 3 is driven by a steam turbine. This Section of the plant also includes the inlet and exhaust manifolds and valves associated with the exhausters.

2.3 AMMONIA REMOVAL

Once the COG leaves the exhausters, it travels first through the Tar Precipitator, and then to the ammonia scrubbers (LGAs).

The Tar Precipitator is an electro-static precipitator (ESP) that is capable of removing fine particulate matter from the COG. Two sumps are located adjacent to the scrubber and are used to collect recovered tar and return it to the Tar Decanter.

Following the precipitator, COG is further treated in three ammonia scrubbers (LGAs No. 4, 5, and 6). Each scrubber is equipped with a recirculation pump and spray nozzles. Water is used as the scrubbing medium to remove both ammonia and acid gases from the COG. Small amounts of blowdown are generated and sent via the surge tank to the excess ammonia liquor storage tanks (Weak Liquor Storage) before being treated and released under permit to the publicly owned treatment works (POTW).

2.4 LIGHT OIL RECOVERY

The next step in the BP Plant is recovery of light oil (benzene, toluene, and xylene). Light oil has historically been removed from the gas stream in the Light Oil Scrubber (LBA). This scrubber is a counter current flow scrubber with wash oil as the scrubbing medium.

Light oil is no longer recovered at TCC. Since this scrubber is no longer being used, there is no wash oil being supplied to the vessel. COG bypasses the LBA; however, the outlet valve is kept open to maintain COG pressure in the vessel and prevent air infiltration. If air were allowed to contact the scrubber packing (wood slats), there could be a potential for unwanted internal oxidation and overheating of the vessel.

This Section of the plant includes the newly installed West BP Flare. This new pressure relief flare will allow plant personnel to control the maximum pressure allowed in the COG system by bleeding gas to the flare. The flare is equipped with a natural gas pilot burner to assure that the pilot is lit at all times.

At this point in the BP system, there are several condensate drop out points to allow for the removal and collection of COG condensate. Condensate is pumped to the Tar Decanter for removal of any tar.

2.5 FUEL GAS

After the Scrubbers, the cleaned COG is used as fuel gas for the plant. This fuel gas is piped under slight pressure to the battery, the boiler house and a gas holder. A second pressure relief flare, the East BP Flare, is available to control the maximum fuel gas pressure allowed in the fuel system as required.

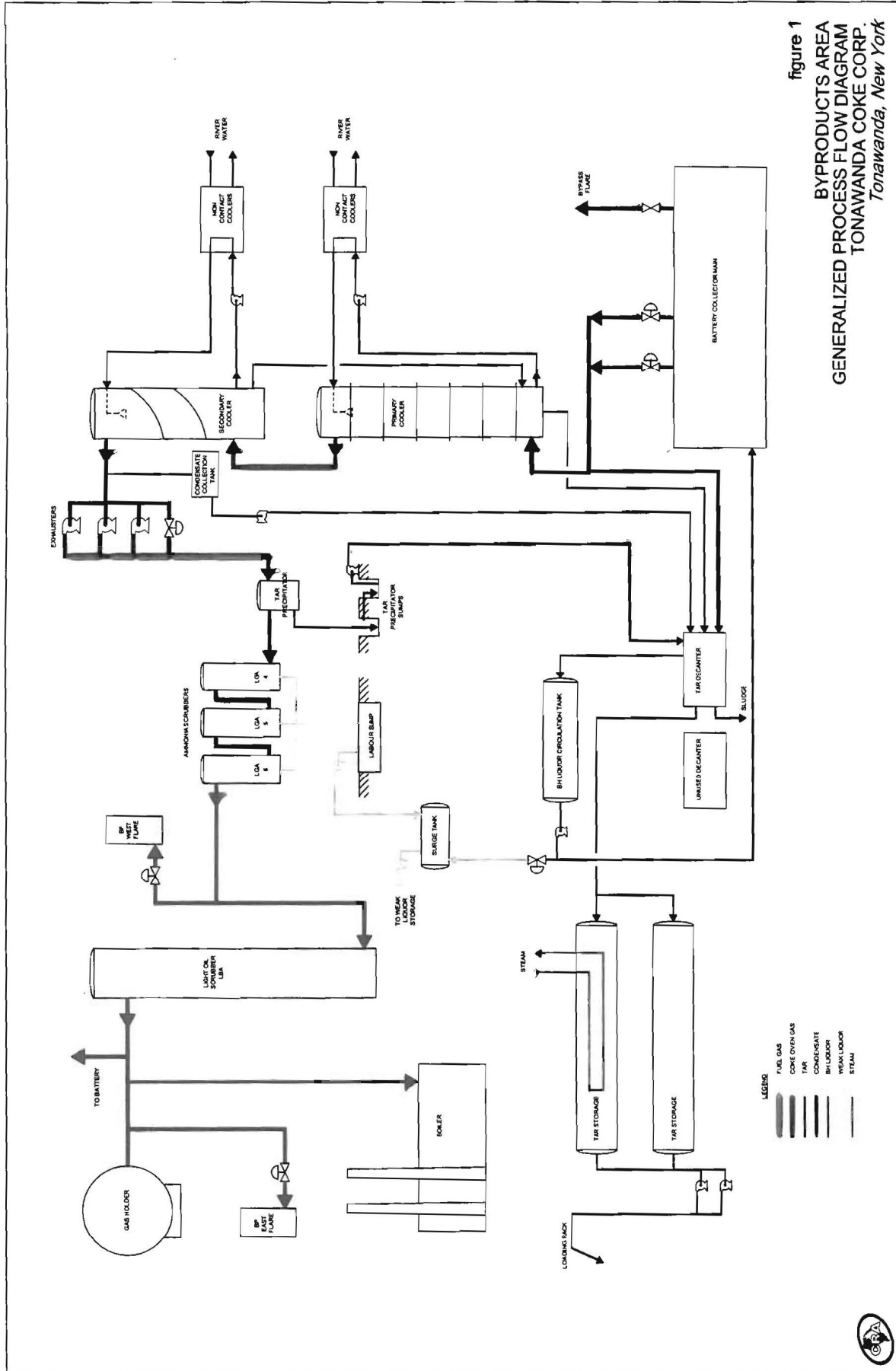


figure 1
 BYPRODUCTS AREA
 GENERALIZED PROCESS FLOW DIAGRAM
 TONAWANDA COKE CORP.
 Tonawanda, New York



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