WASC 2232

Note on
History of
Quinton Hill
Nitroglycerine
Factory

Quinton Hill Nitroglycerine Plant

The Buildings and Plant were erected in 1891 to designs which were basically the same as those of the Nobel plant at Ardeer. Two nitration houses were built on the summit of the Hill, adjacent to one another, but separated by traverses. Only one house would be used at a time allowing maintenance work to be carried out in the other. The two houses shared a Charge House on top of the traverses. After nitration of the glycerine, the nitroglycerine (NG) charge of about 750 lb was separated from the spent acid, using a stoneware cock. The NG was run downhill to the south in lead-lined gutters to the Washing House, where two batches could be washed at a time, 3 times with soda solution, once with water. The waste acid was run off northwards to an After Separation House, where it was kept for a time to enable any further NG to collect on the surface where it could be skimmed off and taken by hand to the Washing House. The waste acid was then run back towards Cobbins Brook.

The washed NG, after testing with litmus paper for free acid, was then run down to the NG Store, and the wash waters to a Wash Water Settling House. The NG Store was adjacent to, but separated from, a building intended to be used as a Dry Guncotton Store. All the Buildings, except the After Separating House and Wash Water Settling House, had high earth and rubble filled brick traverses similar to those used to surround gunpowder buildings.

The Dry Guncotton Store was never used as such, and in 1894 it was being converted to an additional NG Store. The procedure adopted at the time for the making of cordite paste was for processmen to bring weighed quantities of dry guncotton in a rubber bag to the NG Store where a measured quantity of NG, tested for stability by the Abel Heat Test, was added, the "poured-on cotton" then being taken to a mixing house where blending was carried out by hand before the paste was taken to the Cordite Incorporating Houses.

At 4.8 pm on Monday 7 May 1894, there was an explosion in the plant. Both the Washing House and NG Store blew up. Four men were killed; the processman working in the Washing House together with the Chemist-in-Charge and Foreman of the NG plant, and the Foreman plumber who were apparently approaching the Wash House entrance at the time. The NG Store was locked and unoccupied. Other buildings in the area were extensively damaged, particularly No 2 Nitration House where a nitration was in process. The Chemist-in-Charge of the Guncotton Factory, despite being injured, entered the Nitration House and with the two processmen working in the building, saw the charge safely drowned before seeking medical attention.

At the Court of Inquiry, no definite cause of the explosions was found, but there were many suggestions and recommendations made. Despite the evidence of the only eyewitness prepared to say which house blew up first (from the Proof Butts he was convinced the NG Store blew up first), the Inquiry came to the more logical conclusion that the Wash House was the first to explode, and the store followed, the probable cause being the building collapsing in the blast. A carpenter and boy working on the new guttering to the Dry Guncotton Store being converted were between the two buildings and had miraculous escapes, suffering no more than ear damage and bruises respectively.

A number of practices were changed after the explosion. The general public had been allowed to walk in the area on Sundays, without adequate supervision to ensure they did not smoke, and with the possibility that non-safety matches could be dropped on the ground; this access to the area was immediately stopped. Processmen changed their normal boots for those without iron nails in the Shifting Room, then walked to the process buildings along gritty paths to the process buildings, without putting on overshoes; this again was altered so that boots were changed on entry to the process building.

The plant was rebuilt quickly on the same site, although the Court of Inquiry recommended any NG plant should be placed in a position more remote from both the Guncotton and Cordite Factories then in use. Storage of NG was frowned upon, and in the new process, washed NG was "poured-on guncotton" as quickly as possible, and stored in this way. If a sample withdrawn failed the Abel Heat Test, the "poured-on cotton" was destroyed as soon as possible before being worked further. The brick revetted traverses had come in for criticism; despite this type of traverse having contained explosions of gunpowder in the past, the traverses around both buildings destroyed in the explosions had disintegrated and added to the debris distributed around the site. Earth traverses at Ardeer, however, had survived previous explosions there. The new Washing House and Pouring-on Houses were therefore built with earth traverses, and no further brick traverses were constructed. By the autumn of 1894, the NG Factory was back in production.

In 1898, following the Court of Inquiry's recommendation, a new NG Plant was erected at Edmonsey to serve the new Cordite Factory built on the North Site. Several Gunpowder Buildings were altered to Cordite Incorporating or Press Houses. Guncotton continued to be made on the South Site, conveyed by boat to the Grand Magazine at the extreme north end of the site where it was stored wet, dried in several stoves on the North Site, and processed. The cordite was then usually transported back to the Water Stoves on the South Site for drying. The smaller cordite factory on the South Site was used and extended during the First World War.

Both the Quinton Hill and Edmonsey Plants continued in production, without any major mishap until 1901. After separation, a minor explosion occurred in the earthenware cock in Quinton Hill No 2 Nitration House. Little damage was done, but this led to alternative separation techniques being sought. The Superintendent, Nathan, and others patented the process whereby, after nitration was complete, extra waste acid was added to the nitration vessel, and the NG floated off the top over a weir to the Washing House. The new process was installed in No 1 Nitration House, Quinton Hill, and worked successfully in 1903.

By this time, a change was made in the cordite. The old Mark I Cordite, containing 58% NG, 37% guncotton and 5% mineral jelly, proved to be very "hot" in its burning, leading to erosion of gun barrels. A change was made to Cordite MD which contained 30% NG, 65% guncotton and 5% mineral jelly. The reduced demand for NG enabled the Quinton Hill Plant to be put in reserve in August 1903. About this time, a renumbering of the Nitration Houses occurred; Edmonsey Nitration House became Nitration House No 1, and the No 1 and 2 Nitration Houses at Quinton Hill became Nitration Houses Nos 2 and 3 respectively.

Between April ad December 1904, No 2 Nitration House was reactivated whilst new, larger capacity nitration plant of the Nathan design was installed in No 1 Nitration House at Edmonsey. On recommissioning the Edmonsey Plant, the Quinton Hill Plant reverted to reserve in January 1905. During 1907-8, No 3 Nitration House, which still contained the old Nobel design of plant was demolished, together with the After Separation House, a feature of the Nathan process being that, if 5% of water was added to the spent acid, no further NG separated out.

Despite the increased production during 1914-18, the Quinton Hill plant was never brought back into use. Before 1939, a new reserve plant at New Hill was constructed, but despite two explosions in January and April 1940 involving mixing houses at Edmonsey, the New Hill plant was never used.

During 1939-43, the Quinton Hill Plant, which was showing cracks in the brick traverse, was subject to the growth of a legend that, in the explosion of 1894, there was a spillage of NG, and that it was therefore dangerous to approach the Building. However, from the history of the Plant, this legend has very little basis. At the time of writing, Nitration House No 2 is still relatively sound in main timbers, but the brick traverses, especially on the external sides, are cracking and crumbling badly probably through subsidence in the clay subsoil. The Charge House is badly decayed as well, and to a casual observer, the absence of No 3 Nitration House would lead one to accept the legend until the true history

is explored. The empty well for the After Separating House is still visible, and the Washing House built in 1894 is still in place, but badly overgrown, as is the "pouring-on" and junction houses built subsequent to the 1894 explosion.

There is therefore no reason to suppose these buildings cannot be safely cleared, subject to the normal decontamination procedures, if the site is required for new process buildings.

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