3. THE LARGEST EXPLOSION IN THE UK
FAULD, 1944

Visitors to the Staffordshire countryside might be surprised to learn that an attractive, steep-sided valley close to the village of Hanbury is in fact the crater caused by the largest explosion ever to have occurred in the UK.

During the Second World War RAF Fauld was a bomb store comprising surface buildings and the underground workings of a disused gypsum mine, used for the storage of high explosive bombs, incendiary bombs and detonators. The mine had a total area of approximately 50 acres (200,000 m^2). The mine vaults had a depth of 12 to 14 feet (3.7 to 4.3 m), were lined with concrete 2½ feet thick (0.75 m) and had an earth cover thickness of approximately 90 feet (27 m). The dump was divided into four sections and the explosion occurred in section no. 4 which at the time contained an estimated 2,400 tonnes of high explosive.

On the 27 November 1944 refurbishment work was being carried out on high explosive bombs which had been jettisoned by aircraft making emergency landings so that they could be reused. It is not exactly clear what occurred, but it is thought that during the removal or refurbishment of a detonator, sensitive material was initiated. Detonation of a bomb ensued, followed by communication to the other bombs in section no. 4.

Two gigantic mushroom clouds were formed by the explosion and the whole of the surrounding countryside was darkened by the quantities of earth thrown up by the crater. The second mushroom cloud probably originated from the firing of the contents of an open dump of incendiary bombs located adjacent to one of the tunnel entrances to the underground workings. The casualties of the explosion numbered 68 killed and 22 injured. The elliptical crater formed by the event was measured soon after, having diameters of 700 by 900 feet (215 by 275 m) and having a maximum depth of 80 feet (24 m). Hundreds of craters were formed in the surrounding countryside by huge blocks of debris and possibly by bombs thrown out by the explosion detonating on impact with the ground.

A gypsum mine adjacent to the site, situated approximately 600 feet (180 m) south west of section no. 4 of the bomb dump was still being used at the time of the explosion. No material damage to the underground workings of the mine occurred, but there was an accumulation of carbon monoxide as a result of the explosion. Twenty one men were working in the mine at the time of the explosion, five were killed as a result of the gas. The remainder of the men were brought to the surface and survived. Carbon monoxide also seriously impeded the rescue operation in the bomb dump and was not reported clear until three days after the explosion.

The explosion had the effect of bursting a reservoir adjacent to the gypsum mine. The contents of the reservoir flowed down the valley of the works, taking with it considerable quantities of earth and trees, causing an avalanche-like effect. This, together with the blast and debris destroyed the surface buildings of the gypsum works and the associated housing.

Damage due to earth shock was reported as far away as Burton-upon-Trent, a distance of approximately 4.7 miles (7.6 km), where two church steeples were displaced. Damage was also reported in Uttoxeter 6.8 miles (10.9 km) away, where windows in a school were broken.

One third of the underground dump was affected by the explosion, an area of approximately 65,000 square yards (54,000 m^2). The barricades between the sections of the dump held very well and little damage was caused outside section no. 4, bombs in the other sections still being on their racks after the explosion.

Considering the scale of this explosion, the number of casualties must be considered as being very light. The dump construction was clearly strong, eliminating communication between sections underground and the obvious consequences that could have followed. The location in a rural environment meant that only a small number of off-site fatalities occurred following the explosion. However, a total of

200 cattle were killed or injured by the explosion, death being caused by blast, impact by flying debris and shock.

It is impossible to determine accurately how much explosive detonated in the incident because evidence and many uninitiated bombs would be buried by the process of the explosion. Comparisons can be made with the Oppau disaster where a total of 4,500 tonnes of a 50 : 50 mixture of Ammonium Sulphate and Ammonium Nitrate were detonated and caused very widespread devastation and loss of life [1]. If the mixture is rated with an explosive power of 56 [2] (TNT = 100), then the equivalent quantity of TNT would be 2,520 tonnes. Comparisons between the consequences of the two incidents show that those following Oppau were considerably more severe, with a total of 430 fatalities and considerable damage being caused in Frankfurt, a distance of 53 miles (85 km) from the explosion. This reflects the fact that Oppau is a built up area and shows the considerable mitigation effected by underground storage. It may also indicate that not all the explosive in section no. 4 of the underground dump detonated at the time of the accident. It is clear, however, that the accident at Fauld caused the biggest explosion ever to have occurred in the UK.

REFERENCES

1. "Loss Prevention in the Process Industry", F P Lees, Volume 2, First Edition, Butterworths, 1980

2. "Overpressure Monograph", The Institution of Chemical Engineers, 1989