LONGANNET COLLIERY

Longannet Colliery was the last Deep Mine operating in Scotland. It was situated near Kincardine on the North Bank of the Firth of Forth, some 40 miles from Glasgow and 35 miles from Edinburgh. The colliery was a complex of mines with its name being the same as the Power Station it was designed to supply with coal and throughout its life encompassed the mines of Bogside, Castlehill, Solsgirth, Castlebridge Access and latterly Kincardine. All coal production was delivered to the surface at Longannet Mine where it was delivered to its only customer Longannet Power Station.

Longannet Power Station

View looking North West
Longannet Mine Entrance is adjacent to Coal Stocking Ground near top of photo.

Following the success of the pulverised fuel boilers at Kincardine Power Station in the 1950’s using coal from Manor Powis, Dollar and other surrounding collieries, the government of the day agreed on a joint venture between the then S.S.E.B. and the N.C.B., to fuel a new 4 x600MW (2400MW) Power Station at Longannet with coal from the Hirst Seam. Work started in 1960 with production starting 1960?.

Being situated on the North side of the Firth of Forth gave the ideal situation for using the Colds Waters of the North Sea to enhance the thermal efficiency of the station and at the same time, being on the door step of the Upper Hirst Seam, presented the unique opportunity to supply the coal directly by conveyors, in other words the ideal situation for the complete coal power plant.

Longannet Colliery History
Area of Coal Extraction-- This shows the original planned mines, Kincardine being added later.

The Longannet Mine was driven from different points of access to achieve the total distance of some four and a half miles, a remarkable fete of Mining and surveying to achieve the straightness required for the track of the main cable belt to run. On to this belt conveyor the coal from Bogside, Castlehill and Solsgirth would be controlled by vibro feeders from staple shafts.
Longannet Cable Belt-Delivery point to Coal Plant

The Cable Belt was 2 x 1000hp Variable speed control giving 0-650 Tonnes per hour and speeds of between 400-700 ft/min.

Looking Down Longannet Mine

Seen here is the Cable Belt, Rail Track, (Compressed Air, Pumping, Fire Fighting) Pipes and electrical Power Supplies
Longannet Control Room

The speed of the belt and the loadings from each pit being achieved for the first time ever by the use of a Ferranti Computer (Ferranti were based at Edinburgh). Latterly this system was replaced by the NCB Minos System.

In 1984 Bogside became a casualty of the Miner’s Strike and was closed leaving Castlehill and Solsgirth as the production units.

Castlehill Mine
Showing Mine Entrance, Main Surface Fans, Lamp Cabin

Looking down mine from top of Gantry
During the driveage of Longannet Mine, the water table had to be breached and although a considerable amount of cement injection was carried out to limit the flow, water would always need to be pumped. This was via the Keir Borehole with the water being used by the local Paper Mill. Again, the innovation of borehole pumping was used at Piper Pool.
Solsgirth S83 Section

Anderson Strathclyde AM500-Double Ended Ranging Drum Shearer, Hydraulic Fixed Chain Haulage

Solsgirth S83 Section

Same as above, note operator wearing Waterproofs, this due to Roof Water Coming from faulted area in faceline.

Faulting and N.I.T.-Was common within the Mine as the areas of extraction were within major known faults. Also, Non-Igneous Tough (N.I.T.) came into the seam at different times. C63 Faceline started for one week, then took the European Record for Coal Output the next week, when it encountered a N.I.T. Intrusion. That was the end of the faceline.

Longannet Colliery History
Thyssen (Great Britain) achieved

New World Tunnelling Record of 178 Metres in one week in the South 8 Driveage with Titan Roadheader machine

As time moved on there came the need to sink Castlebridge Shaft for easier and faster accessibility for Men & Material.

Castlebridge Aerial View - With Ochil Hills in Background
Castlebridge

This was the latest Shaft to be sunk in Scotland and as one would expect, the latest in technology was used.

View looking North

Canteen

Longannet Colliery History
Castlebridge Water Discharge & Lagoons

To comply with the limits placed for Discharge into the local river system. This series of three settlement lagoons were built, complete with cascade to release any suspended Iron, absorbent floating booms to gather any oil pollutants and not clear in this photo Reed-beds before final discharge into river system.

Castlebridge Hydraulic Oil Holding tanks

To ensure consistency in the Quality of Hydraulic Oil used underground these holding tanks were built on the surface and the fluid the piped underground to each faceline. This also stopped the need of sending the Oil to be sent underground in 10 Gallon Drums, with all the transport problems that it created.
Castlebridge Extraction Area

This shows the planned layout of section for Castlebridge. Each Faceline approx. 250 metre long

South 7 No 3 Trunk Belt
This was the standard Main Trunk Belt (48 ins), 600HP Scoop Controlled, 1200 TPH with Automatic loop take up.
As the cable Belt was a maximum of 620TPH, a Strata Bunker was installed at Solsgirth to smooth out the peaks which could arise in the coal clearance system.
Also with two similar belts (South 7 No 4 & C30) both with outputs capable of 1200 TPH feeding on to South 7 No3 it was possible to overload it, the ramifications of this meant that it had to be unloaded by hand until it be could be restarted. As the Minos system in the Castlebridge Control Room controlled the Belts the Current on South 7, No3 was monitored and when it approached overload conditions either S7 No4 or C30 Belt (depending on the priority at the time) was stopped.
This was called by the operators as the “Thomson Byepass” named after its creator.
To get the Men to and from there place of work quicker, 2-way manriding was used on the main belts.
Quality Control to meet the Market

Before the Privatisation of Scottish Power, when both SSEB and NCB were nationalised institutions and Coal Quality from the Mine did not matter too much as it would be “Sweetened” by coal of a higher quality from the Opencast. However, with Scottish Power now in Privatisation, they were now not prepared to accept this situation, as they could now go onto the Open Market and bring Coal from all parts of the world cheaper.

The Mine had to improve Quality!

The “Upper Hirst” Seam was very consistent in coal quality, the biggest contributor to lowering its overall Quality was the extraneous, friable Mudstone from the Roof which occurred as part of then Mining Process. Breaking into it left the roof weak, promoting more Mudstone into the product. The Roof was stronger if 2ins of coal could be left at the top of the seam. A few different actions were taken namely.
The use of “D Type” girders in the place of Circle Arch Girders, like those shown here in D15 Tailgate, meant the difference of the two cross sections of Mudstone was left in situ. Also, shown here is the waste side packs and the Roadhead Supports.

Introduction of Cable Bolting to secure the friable roof.

Continual Monitoring of the Roofbolts was important to ensure the stability of the roof.
Anderson Strathclyde AM500 fitted with “Midas” steering package which keeps the machine :in seam:"

As previously mentioned aim of this machine was to leave about 2-4 ins coal in the roof, thus preventing the extraneous dirt from spoiling the end product, also providing a stronger roof. This machine had an on-board computer which automatically steered the machine using a Coal Probe (Natural Gamma Transducer), Inclinometers, Extraction Height Transducer, Roof Follower Transducer, Memory and Surface Interface.

Actual Display in the Control Room from BO4 Machine
See the resultant good conditions achieved as the result of the steering system. Twin inboard chain conveyor powered by 2 by 300 hp twin speed motors, one in Main Gate, one in Tail Gate.

Transfer of Coal from Face to integrated stage loader.
Birtley 50tph “Bulldog” Barrel Mobile Washer

As most of the dirt came from the roof it was large enough to be washed out as the trial using this Mobile Washer proved. The product was screened off with the dirt being discarded and the clean coal being fed back into system. This trial proved enough to install a 150tph unit.

Mobile washer unit

A success the fastest 2,000,000 Tonnes Produced March 1992
Driveage Machinery

Dosco Dint header

Dosco

Joy CM3
Continuous Miner

Longannet Colliery History
Mine Environmental Monitoring

For the safety of the mine an Environmental Monitoring System was installed in the control room at Castlebridge using the MINOS Computer system. Transducers were installed throughout the pit to detect—Oxygen, Methane Carbon Monoxide, Surface Air Pressure and one to detect Products of Combustion. The following two graphs illustrate two good examples.

FIDES-Products of Combustion
Looking at the peaks in the First and Third Graph, the first, second and forth peaks are replicated. This was due to Shot Firing in the C30 Belt Area. Whereas the third peak is also present in second graph, due to fumes from a surface fire being drawn through the mine and shown in all units.

Effect of Surface Air Pressure on Methane
First graph shows a sharp drop in Atmospheric Air Pressure and the second graph shows the resultant rise in Methane in the mine atmosphere.
Visitors

Many visitors from all over the world visited the mine, due to its uniqueness and latterly being the only Deep Mine in Scotland.

Russian Visitors along with Anderson Strathclyde Representatives and interpreter, visit Castlebridge to see the AM500 Machine working

Neil Clarke, British Coal Chairman, (Middle of Picture) visits Castlebridge

Dr Ian Preston, Chairman of Scottish Power, (Front Row 2nd from Right visits Castlebridge during installation of equipment in B04Section.)
The Rt Hon Donald Dewer Secretary State of Scotland, unveils a Plaque, opening The Kincardine Reserves 1998

Longannet the Conclusion

As extraction in the Castlebridge came to an end Drives were made South of Longannet into The Kincardine Area and coal production followed. However, on 23rd March 2002 Longannet Mine was flooded due to a possible failure of a Dam, the result of which it would never recover and was closed.