BIG BRUTUS

Regional Historic
Mechanical Engineering Landmark
West Mineral, Kansas

The American Society of Mechanical Engineers
Kansas City Section
September 1987

BIG BRUTUS

HISTORICAL SIGNIFICANCE OF THE LANDMARK

The design and fabrication of Bucyrus Erie Company Coal Shovel Model 1850-B was commissioned by the Pittsburg and Midway Coal Mining Company in 1962. Shop fabrication of the shovel was completed in the Bucyrus Erie Milwaukee factory. The cost of the shovel was $6.5 million.

The coal shovel was shipped in 150 railroad cars to Hallowell, Kansas; subsequent field assembly occupied 52 Pittsburg and Midway employees for 11 months. A small mountain of cribbing timbers was used during construction, as shown in Figure 1. In Figure 2, workmen are shown with the machine´s turret gear. Individual pieces of the machine weighed as much as 120 tons.

When the shovel began operation in Pittsburg and Midway Mine 19 in May 1963, it was the second largest operating coal shovel in the world. Emil Sandeen, then superintendent of Mine 19, called the machine “Big Brutus,” and the name stuck.

Big Brutus was designed to make possible the recovery of relatively thin seams of bituminous coal at depths varying from 20 to a design maximum of 69 feet. The machine traveled at a top speed of just over 0.2 miles per hour and could remove overburden from approximately 1 square mile of surface per year. As overburden removal was completed, other smaller scale equipment was employed to extract the coal. Figure 3 shows Big Brutus at work in Mine 19. The overburden that Big Brutus had removed was then reshaped and revegetated, and the land was reclaimed. Big Brutus was used to recover two coal seams, 18 and 24 inches thick. The coal was used locally for electrical power generation.

Big Brutus´ design life was 25 years, but it remained in operation for only 11 years. By 1974, continued operation of the machine was considered uneconomical, and in April of that year, Big Brutus was shut down. The machine was simply too large to relocate intact; dismantling, transport, and reassembly was also considered to be too costly.

In 1983, the Pittsburg and Midway Coal Mining Company donated the machine to Big Brutus, Incorporated, a non-profit organization of area residents interested in preservation of Big Brutus. Thousands of hours of weekend labor were required to bring the machine to its present condition.

During its 1963 to 1974 operating period, Big Brutus removed overburden from approximately 9,000,000 tons of coal.

Figure 1. Fifty-two men worked eleven months to assemble Big Brutus.

Figure 2. Workmen assemble the huge turret gear.

THE WORDING ON THE PLAQUE

REGIONAL HISTORIC MECHANICAL ENGINEERING LANDMARK

"BIG BRUTUS" COAL MINING SHOVEL CHEROKEE COUNTY, KANSAS 1963

When built in 1962, this shovel was the second largest in the world. It was used for the removal of overburden in the surface mining of thin coal seams. In its lifetime, it recovered nine million tons of bituminous coal from depths of 20 to 50 feet for local electric power generation.

Standing 160 feet high, weighing 5,500 tons, and moving at speeds up two-tenths of a mile per hour, the machine stripped about a square mile per year. The bucket scooped out 90 cubic yards or 135 tons of earth with each bite.

Built by the Bucyrus Erie Company, this shovel was in active service from May 1963 to April 1974.

Figure 3. Big Brutus at work in Mine 19.

DESCRIPTION OF THE LANDMARK

Big Brutus´ motive power was provided by two 3,500 horsepower electric motors. Power for the machine was provided from an Empire District Electric Company substation. Energy efficiency was achieved through the use of regenerative braking during the downward movement of the bucket. The bucket capacity is 90 cubic yards or about 135 tons. The operating crew consisted of an operator who controlled the scoop from a control station on the right front corner of the machine, a groundsman who guided the shovel´s four sets of treads, and an oiler. Operation was essentially continuous, three shifts per day, seven days per week. Additional technical specifications follow.

Model number	1850-B
Number produced	1
Weight, lb	11,000,000
Height, ft	160
Bucket capacity	
Cubic yards	90
Tons	135
Bucket support	Four 3-1/2 inch diameter cables
Shovel cycle time, seconds	50
Power requirements	
Voltage	7,200
Maximum amperage	1,200
Main drive motors	2
Horsepower (each)	3,500
Type	Synchronous
Bucket lift motor-generators	8
Horsepower (each)	500
Type	Synchronous
Leveling system	4 hydraulic jacks
Maximum speed, Miles per hour	0.2
Crew	3

LANDMARK DESIGNATION

Big Brutus is the 10th Regional Landmark to be designated since the ASME Mechanical Engineering Landmark Program began in 1971. In addition, 88 National and 23 International landmarks have been designated; 3 Mechanical Engineering Heritage Sites; and 1 Mechanical Engineering Heritage Collection have been recognized. Each reflects its influence on society, either in its immediate locale, nationwide, or throughout the world.

An ASME landmark represents a progressive step in the evolution of mechanical engineering. Site designations note an event or development of clear historical importance to mechanical engineers. Collections mark the contributions of a number of objects with special significance to the historical development of mechanical engineering.

The ASME Historic Mechanical Engineering Programs illuminate our technological heritage and serve to encourage the preservation of the physical remains of historically important works. It provides an annotated roster for engineers, students, educators, historians, and travelers. It helps establish persistent reminders of where we have been and where we are going along the divergent paths of discovery.

THE HISTORY AND HERITAGE PROGRAM OF THE ASME

The ASME History and Heritage Program began in September 1971. To implement and achieve its goals, ASME formed a History and Heritage Committee, composed of mechanical engineers, historians of technology, and the Curator of Mechanical and Civil Engineering at the Smithsonian Institution. The Committee provides a public service by examining, noting, recording, and acknowledging mechanical engineering achievements of particular significance. For further information, please contact the Public Information Department, American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017, (212) 705-7740.

ACKNOWLEDGEMENTS

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- Numerous officers and members of Big Brutus, Incorporated who have donated thousands of hours to restoration and preservation of Big Brutus.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

KANSAS CITY SECTION
1987

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