Rendered Obsolete:

History of the South Charleston Naval Ordnance and Armor Plant

By

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(Justin Salisbury received his BA in history and government from WVU Tech in December, 2005. He plans additional work in history with a goal of obtaining a doctorate. This paper was prepared for the History Seminar for seniors, under the direction of Dr. Paul Rakes, Professor of History at WVU Tech.)

Introduction

Every day thousands of people in South Charleston see large buildings when traveling down McCorkle Avenue or see them at a distance from Interstate 64. Most people in the area know these buildings as ‘The Stamping Plant’, which has been in the news recently. Some may wish that these gigantic buildings were torn down and replaced by something more pleasing to the eyes. Once these buildings held the Naval Ordnance and Armor Plant, but as technology progressed, they were rendered obsolete.

Origin of the Naval Ordnance and Armor Plant

On the 29th of August 1916 with world war raging in Europe, Congress passed an act providing for a government-owned armor plant and a projectile plant. The site picked for the construction of this plant was South Charleston, West Virginia. Several reasons encouraged the government choice of this site:

1. Distance from the coast.
2. Railroad accessibility (both C&O and NY Central).
3. Sufficient industrial water supply from the Kanawha River.
4. Adequate electrical power supply.
5. Adequate natural gas supply.
6. The actual site was donated by the citizens of Charleston through the Chamber of Commerce.

The Charleston Chamber of Commerce donated the land for the plant. The Chamber collected $310,741 from Charleston citizens by subscription. With these funds, they purchased the 205.1 acres of land, which they gave to the United

1 “History of the Naval Ordnance Plant,” (South Charleston, West Virginia. 1945), 282.
States Government. The Federal Government obtained 4.7 more acres through condemnation at the cost of $44,151.93 bringing the total acreage to just over 210 acres.

The ‘North Unit’ or the projectile plant was the first building to be built. Dirt was broken on August 30th 1917. The north unit was completed in May 1918. Limited operations started on June 8th 1918, while the rest of the north unit was being completed. The north unit was completed on August 5th 1918, and full operations were underway in September.2

The ‘South Unit’ or the naval armor plant did not break ground until October 1st 1918 when the war was almost over. The plant was operable and steel was first poured in the armor plant on February 2nd 1921. Construction continued until February 9th 1922, when the Bureau of Ordnance stopped all work. By this time the plant was near completion.3

**Between the Wars**

The Bureau of Ordnance kept a skeleton crew at the plant after World War I. The personnel there between the wars were: an Executive Officer, a Supply Officer, a Medical Officer, a detachment of Marines for security, and a maintenance crew of 35 men. The maintenance crew consisted of electricians, carpenters, painters, pipe fitters and laborers. These men kept the plant in working condition so it could be used on short notice. As a secondary function, the plant was used as a storage facility between the WWI and WWII.4

In 1937, the future of the plant was questioned when a Democratic Representative of West Virginia, Joseph L. Smith of Beckley, proposed a Congressional bill to sell the unused naval plant. The bill was dropped when President Franklin Delano Roosevelt said that he was not ready to release that information.6 In 1939, the Bureau of Ordnance gave the Carnegie-Illinois Steel Corporation contract N0d-1296 to revive the armor plant. This $3,000,000 contract was for improvements to building 307.7

In August 1940, Carnegie-Illinois Steel was given a second contract N0d-1328, this one for $4,000,000. This contract was for more improvements including: building extensions; additional equipment; additional tracks and roadways; parking lots; outdoor lighting; servicing and rehabilitation of gun lathes and gun treatment furnaces; roofing repairs; and an extension to the main electrical substation.8

Soon after the second contract was signed, Carnegie-Illinois Steel was given a third and final contract for $45,000,000. The contract N0d-1484 tripled the size of the armor plate plant. It was started in 1941 and was generally

5 “Navy Decides Not To Use Plant Here.” The Charleston Gazette. 20 February 1937: 1, 5.
7 “History,” 282.
8 Ibid, 283.
completed in 1943, but some aspects were not completed until 1945.9

Rehabilitation of the North Unit

The armor plate plant began refitting before World War II, but the ‘North Unit’ or the Naval Ordnance Plant was not reopened until after the war had begun. On December 18th 1941, General Machinery Ordnance Corporation signed rehabilitation contract N0d-1709. Unlike the contracts for the armor plant, General Machinery Ordnance Corporation was given a ‘blank check’ so to speak. They were told to get the north unit in condition to make guns, and the government would reimburse their costs. The amount of money spent by G.M.O.C. for the rehabilitation of the north unit and some parts of the south unit came to $6,267,380.37. At the time of the contract, the north unit was composed of buildings 302, 303, and 305.10

To rehabilitate these buildings they removed the equipment; installed reinforced concrete floors; installed the specialized equipment that each building would need; and built tool rooms and tool cribs in all buildings. Buildings 302 and 305 needed boilers and heating coils.11 The other improvements to the grounds that fell under rehabilitation contract N0d-1709 were: construction and moving of multiple buildings and extensions to others; fencing and lighting around the area; four overhead cranes; a twelve ton locomotive for use of the entire plant; and a concrete trash bin.12

In August 1944, The General Machinery Ordnance Corporation entered into a contract N0d-6788 with the Bureau of Ordnance for the production of the 11.75-inch rocket. This caused a new wave of plant upgrades to buildings 302, 303, and 305. Other revamps included: enlarged parking lots; more rail road track; construction of a building to house acetylene generators; and an addition to building 307 in the south unit for painting, packing, and shipping the rockets.13

North Unit Production during World War 2

The General Machinery Ordnance Corporation signed three contracts to produce weapons. These contracts were N0rd-144, N0rd217, and N0rd-635. The first contract N04d-144 was signed on July 16th 1941. This contract was for the production of quantities of three inch, five inch and 6 inch gun barrels. The N0rd-217 contract was signed on December 18th 1941 and was for the production of quantities of 1.1”, twenty-millimeter, and forty-millimeter gun barrels. The final contract N0rd-635 was for the production of the 11.75” rocket and for separate components of this rocket.14

The General Machinery Ordnance Corporation had to overcome a number of problems. The corporation had to use unskilled workers to mass produce large bore gun barrels that were previously produced by skilled navy craftsmen. They overcame this problem by reworking the procedure into a large number of simple steps that each person had ‘on the job training’ to perform.15

Another difficulty was an inadequate supply of outdated machine tools. When the company took over the north unit there were nine World War I model boring lathes and ten engine lathes. The company was not able to get new machinery so it bought any old and obsolete machine tools available. The tools were torn down and reconditioned, then placed into assembly lines. The lathes that could not be reconditioned were converted into grinders or other machines used in production. Single headstock boring mills were converted into double end boring mills. By utilizing old and outdated machinery to its fullest potential, General Machinery Ordnance Corporation was able to perform far beyond the expectations of the Bureau of Ordnance.16

Though the General Machinery Ordnance Corporation had its difficulties starting out, on

9 Ibid, 284.
11 Connaughton, 296-7.
August 10th 1942 the company was awarded the Army-Navy award for excellence in the form of an “E” flag to which subsequently were added five stars signifying that the record of production had been maintained continuously until V-J Day.17

Much of General Machinery Ordnance Corporation’s success lay in innovation. The corporation developed three items or techniques that greatly increased production speed. First, the development of the rubber pack bit which greatly increased the feed and speed of boring. Prior to this, a wooden pack bit could only be used at low speeds. The second innovation was the development of a honing head for honing the walls and bottom of the rifling grooves on large bore guns. With this device the company could hone a five inch gun barrel in three hours where as it used to take twenty-four hours. The third innovation was the use of tungsten carbide cutting tools. Using these tools 450 three-inch gun barrels were machined on tools made for seventy per month. Also because of the carbide tools, 350 five inch gun barrels per month were machined on tools made for thirty per month. Finally 5,000 twenty-millimeter gun barrels per month were machined on tools made for 2,000 per month (see table 1).18

17 Ibid, 299.
18 Ibid, 304-5.
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**TOTAL**  
2793 90280 19470 9889 7935 691 3352 43229 6515

Table 1. Quantities of finished units shipped.

19 Ibid, 301-2.
In its years of production throughout the war, the General Machinery Ordnance Corporation produced 131,058 cannons and components for more than 40,000 rockets for the allied powers (see table 1). Unfortunately the tonnage of armor plate out of the south unit is not available.

The Grounds of the Naval Ordnance and Armor Plant

At the end of World War II there were forty-seven buildings at the site of the naval ordnance and armor plant and over one hundred homes for the workers. Many of these buildings were built shortly before, or during World War II. The plant, while it was an industrial giant of production, was also a community where men and women worked, and entire families lived on the grounds. The plant also had its own school for the children, of the workers.

There were three residential areas of the plant. Officers Country was an area with quarters designated A, B, C, D, and E with a nine-car garage, and a greenhouse. Armor Park had sixty-five tile and stucco houses of various sizes. There was also a schoolhouse and a recreation center and office building. Bungalow Park had forty-two wooden frame bungalows, which housed a multitude of people from officers to civilian workers.

After the War

In the years after the war, the future of the South Charleston Naval Ordnance and Armor plant did not look good. The era of firing thousands of cannons at targets was over. The new era of bombing with aircraft and high explosive bombs and even nuclear bombs had begun. The king of the sea was no longer the battleship bristling with huge cannons, but the aircraft carrier. On August 16th 1945, a Senate committee visited the plant to determine its future. The plants had done their jobs well and had created a surplus of cannon and armor plate. The surplus did not help the plant continue production, because they had enough armor plate and guns as spares. The contracts with General Machinery Ordnance Corporation and Carnegie-Illinois Steel Corporation were terminated when the war ended.

The ordnance and armor plant in South Charleston was the only ordnance plant that the navy held onto after the war. The plant was turned into a central storage facility where strategic machine tools, spare weapons, and spare warship parts were kept. Other buildings on the grounds were used as training facilities for reserve units of the armed forces. For a short time, local businesses were allowed to use the machine tools. This was done to keep the tools in operating condition and to help support the local economy.

In 1961 the Navy decided to close its own manufacturing facilities and leave that work to corporate America. At this time, the Food Machinery and Chemical Corporation was a major industry in the Kanawha Valley. FMC purchased the plant for 4.3 million dollars, and later sold most of the buildings to the Park Corporation. The Park Corporation specializes in buying failing businesses, selling the equipment, and then leasing

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21 “History,” 295.
22 Joe Camp, “Birch Rod to Arsenal: A Study of the Naval Ordnance Plant at South Charleston, West Virginia and the Search for a Government Industrial Policy.” (Ph. D. Diss., West Virginia University, 2002), 188.
Hoffmann, Harry G. “Senate Group Inspects Navy Ordnance Unit.” The Charleston Gazette, 17 August 1945, 1, 14.
23 Camp, 189.
out the property. Today most of the buildings still stand being used in various ways.24

Conclusion

While the plant in South Charleston significantly contributed to war production, the United States would have probably pulled through by converting more industry into armor plate and ordnance production. This would have taken time, but history proved that once the Axis “woke the sleeping giant”, as Japanese Admiral Isoroku Yamamoto stated about the United States, there would have been no stopping it until the Allies were victorious.

The plant was built during World War I, when it was put back into service twenty years later technology had improved, and thus plant had to be adapted to the newest technology. During the war technology advanced again, and once again the plant adapted. After World War II, the technology of war had entered a new era. That fact, along with military production being turned over to corporate America, rendered the South Charleston Naval Ordnance and Armor Plant obsolete.

Appendix

Buildings of the North Unit

Building 301: This building was a 130’ X 40’ Women’s Locker room with concrete floors and tile walls with facilities for 1,000 women.

Building 302: This building was a 565’ X 130’ steel framed machine shop with tile walls and a reinforced concrete floor. Inside was machining equipment for the production of rockets and gun barrels, and attached to the rafters were two 60’ overhead cranes.

Building 303: This building was a 250’ X 90’ steel framed machine shop with tile walls and a reinforced concrete floor. Inside was machining equipment for the production of gun barrels.

Building 304: This building was a 110’ X 70’ Men’s Locker room with concrete floors and tile walls with facilities for 2,000 men.

Building 305: This building was a 400’ X 140’ machine shop. Inside was machinery, a tool room, metal painting booths, and a office and shipping department.

Building 306: This building was a 50’ X 140’, two story with full basement and attic, brick administration building. This is the navy’s main office and administration building.

Building 307: This building was a 660’ X 1,420’ armor machine shop with a steel frame and tile walls. This building had many pieces of machinery and 26 overhead cranes. This building could produce 7,000 tons of finished armor plate a month.

Building 309-310: This building was a 500’ X 1,646’ Forge and Furnace building with a steel frame and tile walls. This building had many pieces of forging machinery and 20 cranes within. This building could heat-treat and forge 5,000 tons of grade A and B armor a month.

Building 311: This building was a 225’ X 520’ four story warehouse. This building was the ‘open hearth’ building until 1944 when they converted it into a warehouse for the Bureau of Ordnance. It is a reinforced concrete and steel frame structure.

Building 312: This building was the 80’ X 250’ main substation. This building was a steel framed tile and reinforced concrete building that housed five transformers and many pumps for the water supply of the plant. This substation supplied electricity for the south unit and redirected electricity to building 335 which supplied electricity for the north unit.

24 Ibid, 206, 212.
Building 313: This building was a 50’ X 60’ boiler house with a steel frame and tile walls. Housed in it were two steam boilers that supplied steam for the operation of two presses, the main water pump in the main substation, a steam hammer in building 383, and they heated both buildings 383 and 384.

Building 315: This building was a 65’ X 65’ wooden garage with capacity for 10 to 12 trucks.

Building 316: This building was a 30’ X 120’ maintenance building that the general plant maintenance crew operated out of.

Building 317: This building was a small transformer house.

Building 319: This building was a 55’ X 30’ fire station with room for three vehicles. Housed here was a Darley fire truck and equipment for charging C02 fire extinguishers.

Building 320: This building was a two story brick barracks with a full basement. This building had two dormitories capable of housing 150 men, a galley and a mess hall to feed 150 men, office space, and a two-cell brig.

Building 321: This building was a small arms magazine.

Building 322 and 323: These buildings were oxygen meter houses.

Building 326 and 327: These buildings were meter houses.

Building 328: This building was a 15’ X 40’ one story brick laundry building.

Building 329: This building was a 15’ X 40’ one story brick laundry building.

Building 330: This building was a 90’ X 30’ three story brick garage with room for three vehicles. Housed here was a Darley fire truck and equipment for charging C02 fire extinguishers.

Building 331: This building was a small arms magazine.

Building 332 and 333: These buildings were oxygen meter houses.

Building 336 and 337: These buildings were meter houses.

Building 338: This building was an industrial water valve house.

Building 339: This building was a 35’ X 120’ sanitary station with lockers and showers. It was capable of accommodating 500 men.

Building 340: This building was an acetylene generating building.

Building 341: This building was a 50’ X 85’ one story brick office building used by Carnegie-Illinois Steel Corporation as its main office.

Building 342: This building was a 25’ X 25’ incinerator building.

Building 343: This building was a 30’ X 40’ sanitary station capable of accommodating 100 men.

Building 344: This building was a 30’ X 40’ steel framed shop with tile walls and a 15” reinforced concrete floor. It was once the old slab conditioning building, but then used by the navy in the 5” gun mount program. This building had two overhead cranes.

Building 346: This building was a 30’ X 90’ one story, oil storage house with tile walls.

Building 347: This building was a track scale house.

Building 348: This building was a valve house.

Building 349: This building was a 30’ X 60’ wooden structure that was turned into a place where a caterer would prepare drinks and food to give to the personnel of the plant. It was formerly a dispensary.

Building 350: This building was a 90’ X 90’ office building used by Carnegie-Illinois Steel Corporation as an accounting and personnel office.

Building 351: This building was a 130’ X 300’ brick carpenter and blacksmith shop. The east end of it was the carpenter shop, and the west end was the blacksmith’s shop. In the middle of the building was a storage area.

Building 352: This building was a 130’ X 300’ brick storehouse. It was used by both the navy and Carnegie-Illinois Steel Corporation.

Building 353: This building was a 30’ X 30’ wooden tool shed.

Building 354: This building was a 35’ X 60’ wooden stable building.

Building 355: This building was a 100’ X 165’ brick roundhouse. It was used for repairing and maintaining locomotives.

Building 356: This building was a 95’ X 170’ brick storehouse. It was used by the general maintenance crew and the naval supply office as a storeroom.

Bibliography

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“FDR Tours Plant Here, Hints Navy Plans New Outlay.” The Charleston Gazette, 4 September 1940, 1.
Hoffmann, Harry G. “Senate Group Inspects Navy Ordnance Unit.” The Charleston Gazette, 17 August 1945, 1, 14.

Documents

“History of the Naval Ordnance Plant, South Charleston, West Virginia” Report. December 1945. (Unknown Author, was a government report)

Other Sources

The following text from a flyer was found in the Department of Archives and History Collections. It is a reminder of the difficulty with which people in our state sought ways to protect themselves from the spread of epidemic disease.

SMALL POX QUARANTINE

_______________________________________
_______________________________________
_______________________________________
STATE BOARD OF HEALTH
OFFICE OF SECRETARY
MARTINSBURG, W. VA.

Quarantine Regulations of State Board of Health, June 7th 1892

To Whom it May Concern:

WHEREAS: Small-pox has been declared epidemic in the towns of Pomeroy, Ohio, and Mason City, West Virginia, and is prevalent at several other points on the Ohio river between Parkersburg and Huntington; and
WHEREAS: The State Board of Health is charged with the duty of protecting the citizens of this State against the introduction and spread of contagion and infectious diseases; and believing such introduction and spread is now seriously threatened by the condition of the public health at Pomeroy, Ohio and Mason City, W. Va. it is, therefore, hereby ordered:

First – That on and after the date of this publication, no person will be allowed to leave Mason City, W. Va., or be allowed to enter the State of West Virginia from the town of Pomeroy, Ohio, by railroad, steamboat or any other means, until further orders.

Second – Citizens of Middleport, Cheshire, Chester and Gallipolis, Ohio and New Haven, Hartford City, Clifton and West Columbia, West Virginia, where the disease is not epidemic, will be allowed to leave and return when provided with a pass from one of the health officers, showing that they have not been exposed to the disease.

Third – Inspection Stations have been established at Middleport, Cheshire, Chester and Gallipolis, Ohio; and at Parkersburg, Ravenswood, Hartford City, West Columbia and Pt. Pleasant, West Virginia.

Fourth – It shall be the duty of said officers or agents of the State or local Boards of Health to prohibit the unloading of any freight or cargo from the town of Pomeroy, Ohio, which shall comprise clothing, personal baggage, rags, hides, skins, feathers, hair and all other remains of animals, woolens, bedding, upholstered furniture, and textile fabrics of every character, at any point within the limits of the State of West Virginia.

Freight from points between Middleport and Gallipolis should have certificate of health officer that it has not been in any way exposed to the infection of small-pox.

The penalties prescribed by law for the violation or infraction of the orders of the State Board of Health will be rigidly enforced in carrying out this orders.

N. D. BAKER, M. D.
Secretary State Board of Health