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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.¹

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 stated that even though they had no current plans for the plant, in view of current world affairs they would keep it for the

time being.⁵

On September 3rd 1940, President Roosevelt toured the South Charleston Naval Ordnance and Armor Plant, and stated that the north unit was to be converted into a weapons making facility and would no longer make ammunition. He also said that the south unit would receive \$20,000,000 of rehabilitation, and the north unit \$50,000,000.

Rehabilitation of the South Unit

On November 5th 1938 Franklin D. Roosevelt announced that the military would be surveying all federally owned lands and plants capable of use in National Defense. In the same speech, he stated that he had already decided the South Charleston naval plant would be reopened. When questioned if the plant was to continue producing armor for ships, President 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.

6 Felix Belair Jr., "Roosevelt Orders Defense Survey; Checks Resources to Rush Plans," The New York

Times. 5 November 1938: 1, 20.

7 "History," 282.

8 Ibid, 283.

2 Ibid, 283

3 Ibid, 282-3.

"Naval Ordnance Plant Made a Complete Unit," The Charleston Daily Mail. 2 February 1921: 1-2.

4 "History," 282-3.

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

⁹ Ibid, 284.

¹⁰ J. F. Connaughton, "General Machinery Ordnance Corporation", 29 November 1945, 296, 298-9.

¹¹ Connaughton, 296-7.

¹² Ibid, 297-8.

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

¹³ Ibid, 296-8.

¹⁴ Ibid, 299-300.

¹⁵ Ibid, 302-3.

¹⁶ Ibid, 303.

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.

Date	NOrd-217 Gun Barrels			NOrd-144 Gun Barrels			NOrd-635 Torpedo	NOrd-6788 Rocket Rocket	
	1.1	20mm	40mm	3"	5"	6"	Air Flask	Motor	Head
	1941								
Oct.	149				60				
Nov.	200				71				
Dec.	104			40	150				
1942									
Jan.	38			40	32				
Feb.	142	50		70	76				
Mar.	174	512		170	132				
Apr.	404	1065		233	195				
May	274	1175		329	115	12			
Jun.	373	2022		352	120	42			
Jul.	137	2019	249	408	160	46			
Aug.	300	2025	351	429	165	46			
Sep.	59	2352	470	432	160	48			
Oct.	58	2608	609	442	175	40			
Nov.	253	2967	464	420	156	35			
Dec.	46	2658	252	544	200	45			
1943									
Jan.	7	2215	353	375	210	22			
Feb.	71	2398	358	361	212	14			
Mar.	1	3004	412	391	292				
Apr.	3	4000	300	367	300				
May		4214	310	316	318				
Jun.		4256	275	358	300		28		
Jul.		4523	303	377	275		94		
Aug.		4500	323	375	285		157		
Sep.		4500	500	375	275		180		
Oct.		4500	500	420	267		180		
Nov.		4500	656	420	266	2	180		
Dec.		4500	500	420	272	15	180		

1944									
Jan.		3600	600	150	270	22	180		
Feb.		3600	702	150	270	38	180		
Mar.		3600	800	150	260	38	200		
Apr.		3603	900	170	260	30	250		
May		1600	1002	170	260	30	250		
Jun.		1600	1000	135	260	30	250		
Jul.		1603	1000	141	235	25	250		
Aug.		1600	1000	135	235	25	250		
Sep.		1600	803	95	235	25	250		
Oct.		1311	600	129	199	15	250		
Nov.			500		169	15			164
Dec.			500		43	31	37		800
1945									
Jan.			500				6	1600	
Feb.			300					2900	
Mar.			300					4075	
Apr.			300					5165	450
May			300					7125	1085
Jun.			300					8365	1800
Jul.			300					7100	1765
Aug.			300					5050	1239
Sep.			278					885	176
TOTAL	2793	90280	19470	9889	7935	691	3352	43229	6515

Table 1. Quantities of finished units shipped.¹⁹

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.²⁰

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.²¹

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.²²

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.²³

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

²⁰ "History," 294-295.

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' over head 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 320: This building was a small 10' X 35' tile Valve and Fire House.

Building 322: This was a one story 50' X 60' tile office building. This building was used by the navy as a navy inspection office.

Building 323: This building was a 30' X 90' office building used as an engineering office by General Machinery Ordnance Corporation.

Building 324: This building was a 25' X 40' reinforced concrete River Pump House that is constructed into the ground and goes 20 feet below the level of the river. It is approximately 75' from the roof to the bottom of the lowest level and is filled with pipes and large water pumps.

Building 334: This building was 45' X 200' office building used by General Machinery Ordnance Corporation as a main office. The east wing was two stories while the rest was one story.

Building 335: This building was a 30' X 30' substation with 4 transformers, which provided electricity for the entire north unit. The electricity came from the main substation, building 312.

Buildings of the South Unit

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. It had many offices and a 35' X 360' Men's sanitary room. 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 327: This building was a 90' X 35' brick dispensary. This building had two small wards, a general clinic room, a medicine room, a doctor's office, and a small garage for the ambulance.

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

Building 329: 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 C² fire extinguishers.

Building 330: 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 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 343: This building was a 25' X 25' incinerator building.

Building 344: This building was a 30' X 40' sanitary station capable of accommodating 100 men.

Building 345: This building was a 110' X 420' 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 365: 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 368: This building was a 90' X 90' office building used by Carnegie-Illinois Steel Corporation as an accounting and personnel office.

Building 383: 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 384: This building was a 130' X 300' brick store house. It was used by both the navy and Carnegie-Illinois Steel Corporation.

Building 388: This building was a 30' X 30' wooden tool shed.

Building 392: This building was a 35' X 60' wooden stable building.

Building 400: This building was a 100' X 165' brick roundhouse. It was used for repairing and maintaining locomotives.

Building 401: 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.

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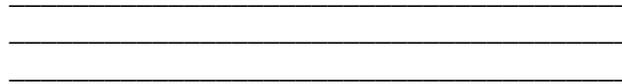
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The following text from a flyer was found in the Department of Archives and
 History Collections. It is a reminder of the difficulty with which people in our state sought
 ways to protect themselves from the spread of epidemic disease.

SMALL POX QUARTANTINE



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 Middle port, 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

