Report of W. M. Riggs on Power House

Clemson College, S.C., May 29, 1903.

Dr. P. W. Pell, President
Clemson College, S.C.

Dear Sir:

As per request of the Special Trustee Committee appointed to look into the building of an Agricultural Hall and Gymnasium, I have built a Power Plant. I beg to submit the following general report regarding the advisability of centralizing our power & heating.

The following plant are in operation on the College property:

1. The Heat, Light & Water Plant situated in the Mechanical Building at a cost of $2,100. It consists of:
   - 1 75-horsepower engine
   - 1 75-kilowatt generator
   - Furnishing steam heating for the Mechanical & Chemical Departments, and water, light, & power for all divisions of the college.
   - Annual coal consumption will average about 950 tons, and the total cost of operation, including coal, labor, repairs, and materials used in the plant, is about $3567.00.

2. The Barracks plant, used for heating the Old & New Barracks, College Building & Chapel. This plant consumes about 24 tons of coal annually, and its remaining expense, including coal, labor, etc., is about $246.00.

This is the textile heating plant, which consumes about 40 tons of coal, and cost
for coal, extra labor, supplies, etc., $313.00

Summary of Cost

All Heat, Light and Water
Mechanical Hall, Water & Electric Plant --- $55,67.00

Barraceld Heating Plant --- 2,460.00
Textile Heating Plant --- 313.00

Total for coal, labor, repairs, and supplies used in plants --- $8,340.00

I do not believe that by centralizing our power we could, with our present load, save anything in the cost of the items included in the above summary. Test show that we are turning coal very efficiently in both Barraceld & Mechanical Hall plants, and I do not think when condensation is had for the steam, condensation in the necessary long transmission mains that any coal can be saved from the present consumption.

In the matter of labor — we would have to employ three engineers as we now do in the Electric plant for the 24 hours' run. Three engineers who now do their own firing and receive an average of $48.33 per month, would have to be provided with firemen during two of the shifts for at least 6 1/2 months of the year. A competent fireman could not be had for least 30.00 per month, which for 6 1/2 months, would be $390.00 or practically as much as the labor of the Barraceld & Textile heating plants is costing annually.

In the event of a Central Plant being
Built and the present plants removed from the Mechanical Hall, the reduction in size would be $50 per $100.00. The Mechanical Hall is insured for $5,000, and the Barracks for $15,187.50.

In the former, the total annual saving would amount to $200.00. The premium on the Barracks is only 1%, and this would not probably be reduced by the removal of the heating plant.

The annual premium on the insurance of the Central Plant—pulling the value of the building and machinery at $20,000.00 and the rate of premium the same as that paid on the Mechanical Hall—$500.00 (it would hardly be lower than that) would be $500.00 a year increase in insurance alone of $240.00 per year.

In account of the long line of transmills, steam pipes and the greater amount of machinery connected with the proposed new plant, the repair and depreciation charges would certainly be materially increased.

So much for the consideration of relative operating cost: the Commissary does not feel much present any distinct advantage in favor of the Central Plant. Change from our present separate plants.

However, time is other weighty reason to be considered. Also running expenses:

First: We are always at the limits of our capacity. Any material increase to our demands for power or heating must be met by additions to our present equipment.
In case of the Power Plant in the Renewal Hall, the room is rather small for which the present engine - however it could be used.

Also, our smaller stack is too small for any additions. If another was added, we would be compelled to put in a forced draught, or build another or larger stack. To put in another Rocky engine, generator and switchboard, apparently in this way would cost about $6000.00 - All $2000.00, and the present plant could be made up to date and fairly representative of modern practice.

However, time with the ever present danger of the Mechanical Hall burning is growing. Even if the plant would provide with it, and every division of the College be deprived of light and power.

There can be no doubt that the time is near at hand when additions must be made to our capacity. Otherwise, we must stop all extensions that require power, light or heating.

I sincerely hope that we have not yet arrived at this point, for among other desirable things we should establish an Electric line to California not only for teaching purposes but to give to our students instruction in Electric Street Railway Engineering. The electric street railway is the first important branch of the entire electrical industry, and as in College and country, gives this practical engineering course. It is an opportunity for students that will, I hope, in the near future be appreciated and embraced by our trustees.
Another strong point in favor of a central power or heating plant is that it could be made
a valuable object lesson for our students in engineering. Our present plants can
finally be disposed of, and, could a new
plant be installed we would have a more
modern machinery which, though service-
able, is antiquated.

I have attempted to present fully both
sides of this matter. It is needless to say
that personally I decline to see a first-class
up-to-date central plant built, which as well
meet our present needs, and anticipate
our future growth.

However, were it not for the probable need
of the proposed Agricultural Hall, I should
give it unequivocally as my opinion that
the time for centralizing has not yet come,
but will, until extensive repairs or additions
to boilers & machinery now in use become
necessary (for example, when it becomes
necessary to renew the. furnaces),

However, if the Agriculture Hall is built, pro-

vice must be made to heat it, and this
will necessitate the addition of another
boiler, and the necessary induced draft
apparatus to our present plants in the
Mechanical Hall.

A boiler could be bought to match
the 18 & 32 boilers now in use, and if
later the centralization was effected, the
boiler would be paid for by the cost of erection
of the cost of the draught apparatus.

This would probably amount to 5 $5,000. The
boiler would cost about 9 $1,000.
The cost of centralization will be about $26,000.00.

Respectfully submitted,

(Signed) U.M. Peagge

(In charge of Light, Heat & Water)
Department of the College.
1. Chemical & Scientific, Director (Exp. $2500) 2500
2. Academical
3. Agricultural, Director
4. Textile, Director 2000
5. Mechanical & Electrical, Director 2000
6. Military, Director 4000

Professorships
1. Eng. (Gilreath) 1750
2. History
3. Theology & Mineralogy 1750
4. Mathematics

Associate Professorships
1. Chemistry (Paxalt) 1500
2. Mechanical Engineering (Earle) 1500
3. Physics (Proctor) 1500
4. Veterinary Science (Park) 1500
5. Weaving & Designing (Fitzell) 1500
6. Forestry (C.C. Ewenson) 1500
7. Drawing (Lee) 1500
8. Entomology & Zoology (Chambles) 1500
9. Botany & Bacteriology (Chambley) 1500

Assistant Professorships
1. Agricultural Arts & Science (Drake), (Exp. $1500)
2. Eng. (McLeod) 1200
3. Agriculture (Beaton) 1200
4. Forestry & Farming (Johnson) 1200
5. Mathematics (Walker) 1200
6. Eng. (Harns) 1200
7. Woodcutting Shop (Wright) 1200
8. Mathematics (McLelland) 1200
9. Drawing & Textile Chemistry (James) 1200
10. Mathematics (Hume) 1200
11. Electricity (Byrson) 1200
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**Instructors**

1. Chemistry (Henry) - 900
2. Veterinary Science (Steady) - 900

**Assistant**

1. Woodwork (Stark) - 700
2. English (Parker) - 700
3. English & Mathematics (Brealey) - 700
4. Mathematics (Huston) - 700
5. Drafting (Dungan) - 700
6. Faculty (Watson) - 700

**Assistant**

1. Woodwork (Stark) - 700
2. English (Parker) - 700
3. English & Mathematics (Brealey) - 700
4. Mathematics (Huston) - 700
5. Drafting (Dungan) - 700
6. Faculty (Watson) - 700