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## The Four-Quarter Plan from an Engineering Standpoint

By E. A. HITCHCOCK, *Dean of The College of Engineering*



IN 1862 the United States Government placed upon the State of Ohio the responsibility of building and operating an educational plant in which the sons and daughters of the State were to be taught "such branches of learning as are related to agriculture and the mechanic arts, without excluding other scientific and classical studies." There were no rules or regulations laid down as to how this plant should be operated nor were there any "strings" tied to the project which would in any way embarrass those who were responsible for its beginning and success.

The plant organization originally consisted of a Board of Directors (trustees), a general manager (president), with his division, department heads (professors) and subordinates (instructors and assistants). As the plant grew in size and as the load increased, the organization was modified by the addition of division directors (deans of colleges).

Custom and tradition demanded that this plant operate seven hours per day, five days per week or approximately nine months or a total of 1274 hours per year. Based upon a plant running through the year and operated twenty-four hours per day, the college period gave an operating load factor of only 20 per cent. When compared to public utilities which serve the people every hour of the year, the load factor of our educational plant was 14.5 per cent.

As the demand for higher education grew, there was a corresponding increase in load upon our plant. As a result, the unproductive summer hours began to be utilized and the operation hours rose to 1948—a load factor of 30.5 per cent or a gain over the previous method of operation of 52. per cent. In addition to utilizing the summer hours, the recitation and laboratory periods were extended to 5 p. m. and to 12 noon on Saturday. With the introduction of the Four Quarter Plan, the operation time has been further increased to 2052 hours. Now there is a load factor of 32.2 per cent or a total gain of 61 per cent.

It may seem hardly analogous to compare this educational plant with industrial ones; nevertheless the comparison is fair as far as the physical plant and its possibilities are concerned. The factors however, which make parallel operation impossible between the educational and industrial plants are the students and the instructors. Students would not willingly accept class and laboratory work from "sun down to sun up" and a force of capable instructors would not be willing to reverse their habits of life. Consequently the logical time load factor under the Four Quarter Plan for our plant is the actual running hours, i. e., 2052 divided by the practical possible hours or 2226. These give a load factor of 92 per cent.

The three most important factors sought for in plant operation are increased quantity, a better quality and decrease in cost per unit of production. In the University, all three factors are largely dependent upon the complete and successful operation of the Four Quarter Plan.

The quantity increase is obtained through the increase in operation load factor. One year, or rather eleven months of operation in place of something

less than nine, increases the capacity about 33 per cent; yet practically all that is necessary to care for an additional load is additional instruction.

The Four Quarter Plan carries with it a repetition every quarter of many subjects which are prerequisites for subsequent courses. In the past many students, due to irregularities and subsequent inability to obtain the required subjects, have been compelled to withdraw from college. At the time of withdrawal they fully intend to return at some future time but the attractiveness of their positions has counteracted their previous ambition and they never complete their University education. This "dropping out" decreases in the aggregate the quality of our plant product, for a finished article is of more value than an unfinished one.

The final test of true quality of a product is its usefulness. The University product is the young man who has received special training and who, on account of his ideals, is qualified to serve his community and his country. His rating is gauged by what he is doing toward world advancement.

For the instructor the Four Quarter Plan opens up new avenues of opportunity which have been closed to him heretofore. He is now able to spend time in study and research at other institutions when these are in session. He can go into the business or engineering world at quite regular intervals. There rubbing elbows with executives, subordinates and others, he gains an understanding of human relationships which can be obtained in no other way. As a result of such experiences our instructor will necessarily be a bigger and broader man and therefore pass on to our university product those qualities which make for true success.

The operation of the University eleven or twelve months in the year rather than nine months necessarily carries with it a reduction in unit cost, especially if interest and depreciation are charged to the product as they should be. The State of Ohio has here an investment of several millions of dollars. To have buildings, recitation rooms and laboratories standing idle would not seem to be good economics. To operate this plant at full load during the summer quarter requires no addition to the physical plant. The administrative forces in president's, bursar's, registrar's and dean's offices are practically the same throughout the year. The service plant is always in operation, though no heating and very little lighting are required. Therefore, to carry on a summer quarter, the additional cost is only that required for necessary instruction. The overhead expense remains practically the same.

Considerable comment of late has appeared in papers and magazines relating to the enormous waste going on constantly in the industries of this country. Management is charged with greater loss than labor, and educational institutions, largely on account of their closed doors during the summer season, have been said to be wasteful. The engineering educator has recognized this inefficiency. According to his creed it is wrong to have a plant standing idle. If he has not protested it is because he has been bound by tradition which will seldom, if at all, contribute to engineering development.