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November 6, 1956

TO: Korean Advisory Committee
FROM: Tracy F. Tyler
SUBJECT: Report of Dr. Sidney C. Larson

At the meeting of the Korean Advisory Committee on October 10, 1956 it was agreed that the report prepared by each staff member serving in Korea would be made available to each member of the Korean Advisory Committee.

The attached report, prepared by Dr. Sidney C. Larson, is the third of several reports which were filed earlier and which will be made available as fast as they can be dittoed in my office.

Att.

Tracy F. Tyler

THE ELECTRICAL ENGINEERING (POWER)
AND TELECOMMUNICATIONS DEPARTMENT
of the
COLLEGE OF ENGINEERING
of
SEOUL NATIONAL UNIVERSITY OF KOREA

A report by

Sidney C. Larson

December 7, 1955

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December 7, 1955

REPORT ON ELECTRICAL ENGINEERING (POWER)
AND TELECOMMUNICATIONS DEPARTMENT

of the

ENGINEERING COLLEGE

at

SEOUL NATIONAL UNIVERSITY

1. INTRODUCTION

This report covers the investigations of the Adviser to the Departments of Electrical Engineering and Telecommunications of the Engineering College of Seoul National University. These two departments include the fields of electric power, electronics and communications, which are usually contained in one department in American universities. Professor Woo, Hyung Ju is head of Electrical Engineering, and Professor Lee, Jai Kon is the head of Telecommunications. Both of these professors and their staffs have been most cooperative, which has made this assignment at Seoul National University a very pleasant one.

The offices of the instructors in these departments are in building Number One of the Engineering College group, as are also the laboratories for Telecommunications. The laboratories for Electrical Engineering are in building Number Four. These buildings both suffered considerable war damage, which has been only partially repaired.

2. BUILDING RENOVATION

Much of the damage to the buildings has been patched up but a great deal is still left to be done. Many rooms need a good cleaning and painting. Many of the original doors are missing and have been temporarily replaced by doors made from rough lumber or plywood. Most of the floors are concrete

and some suitable finish should be found for these floors to keep them from dusting and to give a better appearance to the rooms. The plumbing in the buildings is in a very poor state of repair and should be surveyed to determine what can be done to modernize the toilets and eliminate the odors.

3. LABORATORY FURNITURE

In order to make good use of the laboratory equipment suitable laboratory benches for using the apparatus and adequate cases or shelves for storing and protecting the equipment should be provided. Some benches have been built for the machinery laboratories using available switches and lumber and it is suggested that these may be further developed to make them as flexible as possible so that a variety of experiments may be adequately performed with their use. Particular emphasis should be made on meter connections so that the measurements can be made with safety to both personnel and equipment. The faculty members from Seoul National University should examine the laboratory benches and equipment at Minnesota very thoroughly to get ideas for the design of laboratory furniture at Seoul National University.

4. ELECTRICAL WIRING

There has been considerable damage to the wiring in the laboratories and switchboards. A survey of the present wiring and an estimate of new wiring might be made at this time since the equipment lists are now completed and the future needs can be quite definitely determined. A considerable amount of wiring will be necessary.

5. EQUIPMENT LISTS

Equipment for the laboratories has been selected under the direction of Prof. C. E. Lund. Old lists which were prepared last spring

and summer were examined and the deleted items were re-evaluated to see if they should go on the new lists for future procurements. The quantities of some items were increased and many new items were added. The equipment lists were made out with the thought that undergraduate instruction comes first, then graduate work and research. However, it is realized that much research can be done with the equipment used in the undergraduate laboratories. The completed lists are incorporated with the lists of all the other departments.

6. STAFF

The staff of the Engineering College were interviewed and several classes were visited. Their instruction methods seem very similar to the lectures in American Universities. They require outside preparation of about 2 hours per hour of lecture and have problem and reading assignments. The shortage or lack of text books presents some difficulties not encountered in American universities. Some classes receive the course material almost entirely by lecture methods with problem assignments given orally or written on the blackboard. Some classes have texts written or translated by the staff members. These texts are paper covered and seem to cover the field very well. The library has a limited number of books which the students can use as references.

Most of the staff members do consulting work or outside teaching to augment the low salaries paid at the University. For this reason the staff members are present at the University only a few days a week or a few hours a day, or both. This causes the administration of the faculty to be quite loose and inhibits the exchange of ideas between the various members because they do not see each other very often and communication is difficult.

The staff in general are well grounded in their fields and are competent teachers. It is believed that this competence will extend over

into the new laboratory courses when the new equipment becomes available. All the staff are enthused and are looking forward to the time when the laboratories will be completed.

7. CURRICULA

The curricula of these two departments are largely lecture courses with small number of contact hours per course per week, usually 2 or 3, except for mathematics, physics and chemistry which meet a large number of hours (6 to 10 hours). The variety of the courses is large and includes several subjects which are not taught in four year engineering courses in America, such as Electric Code, Electrical Materials, Electric Railroads and several non-technical courses in the fields of languages, economics and philosophy. This "loading" of the curriculum with lectures is dictated by the present lack of laboratory equipment and facilities. In general the selection of the course subjects is good and it is felt that these courses should not be changed until the laboratory work is augmented (See Section 8).

8. INTEGRATION OF LABORATORY WORK WITH LECTURES

As new laboratory equipment arrives new laboratory experiments must be devised. It is recommended that these experiments be worked out very carefully so that they are correlated with the lecture to provide well-planned curricula. At present the curricula consist of a large number of lectures given in different areas of the field. This lecture type of curriculum was dictated by the lack of laboratory equipment and as a result the students are well grounded in the theoretical aspects of the field. As the new laboratory work is added the number of lectures must be reduced. This should lead to consolidation of courses and integration of the whole program to give a better pattern to the curriculum.

Laboratory work leads to solutions of problems by experimental means and checks theoretical calculations by actual measurements. Since

all physical theory is based on some fundamental experiment the experimental approach to problems should be encouraged as well as the theoretical derivations. This work in the laboratory can be called "learning by doing" and this is the part that needs development at Seoul National University Engineering College.

The actual location of the laboratories and final allocation of laboratory equipment is being handled by a planning committee headed by Professor Yum of the M. E. Department. They will plan the laboratories and allocate equipment so that it may be used to best advantage. Members of this committee include staff from all departments.

9. COMBINING DEPARTMENTS OF ELECTRICAL ENGINEERING (POWER) AND TELECOMMUNICATIONS

At present the electrical engineering field is taught by two departments, Electrical Engineering (Power) headed by Professor Woo, Hyung Ju, and Telecommunications headed by Professor Lee, Jai Kon. These two departments are cooperating on courses so as to eliminate duplication of instruction and laboratory equipment. As long as these conditions exist there is no need for combining these under one head. However if at some future date it becomes convenient for the administration to combine these two departments it is recommended that they do so. Since these fields have much of the same material in the basic courses and are supplementary in the advanced areas they should be administered by a single department head or with very close cooperation.

10. POWER FOR THE ENGINEERING COLLEGE

The proper functioning of the laboratories of the Engineering College is completely dependent on a reliable electrical power source. At present the power is on intermittently and may be interrupted at any time. For this reason Professor Woo, Head of Electrical Engineering, and

myself consulted with Mr. Sung, Chang Young, Manager of the Power Department, Seoul Electric Power Company, and Mr. Park, Yongchul, Assistant Chief Electrical Engineer, Korea Electric Power Company. Both gave the same recommendations. In the spring of 1956 new generating plants would provide adequate power for the demands and this condition would continue through 1957. However, in 1958 the demands would exceed the supply and a priority system would have to be worked out. Because of the expected shortages and the remoteness of the Engineering College both recommended local generating facilities be installed. An Engineering College committee has estimated the demand at 300 kilowatts and it is recommended that two 150 K.W. 3-phase 60-cycle diesel electric generators be installed to provide this power. The two units may be operated in parallel for heavy loads and singly for lighter loads. If one unit is being repaired the other may supply enough emergency power. Adequate power also solves the water shortage problem which is caused by lack of power for the pumps.

11. AMERICAN STAFF AT SEOUL NATIONAL UNIVERSITY

The work which the adviser in Electrical Engineering and Telecommunication set out to do in the Fall of 1955 is being completed at the College of Engineering. Equipment lists have been compiled, staff members have been interviewed and a survey of curricula has been made. This report gives the results and recommendations.

Many important faculty members (mostly department heads) from Seoul National University are scheduled to go to the United States from April to October 1956 to survey courses, curricula and administrative procedures there. The return of these professors will come at the same time as the arrival of the equipment being purchased now in the United States and the changes in the curricula will begin then. It will be very

important that an adviser be present at this time when new laboratories are being set up, and the new laboratory courses are organized. The period from January to the summer of 1956 can be handled by the Engineering adviser, Mr. Weems, while the advisers who have returned to the United States can be used to advise the Seoul National University faculty members there. However, when Mr. Weems leaves Korea in the spring of 1956 provision should be made to maintain continuity of advisers, especially during the period of reorganization.

12. SUMMARY

In general the departments teaching electrical theory are doing a very good job under the trying circumstances of reconstruction and lack of laboratory equipment. The recommendations in this report are made as suggestions for improvement and development as the curricula are changed by the addition of more laboratory courses and not as criticisms of present conditions. The following is a summary of the recommendations:

1. Renovate buildings as soon as possible.
2. Design and construct (or obtain) laboratory furniture such as equipment cases and benches for laboratory experiments.
3. Recondition electrical wiring system.
4. Work for increased salaries for the staff so they will spend full time at the School and thus increase the effectiveness of their teaching.
5. Re-check the curricula as new laboratory courses are added so that an integrated pattern of instruction will be obtained.

6. If it is administratively feasible combine the two departments of Electrical Engineering and Telecommunications into a single department.
7. Provide a diesel electric power plant of 300 k.w. 3-phase. Two identical 150 k.w. units would provide a flexible and reliable arrangement which will take care of reduced loads economically and will also provide limited power in case of a shut down of one unit.
8. Provide additional advisers for the departments of Electrical Engineering and Telecommunications, especially during the period of reorganization which will start in late summer of 1956 when the new laboratory equipment will arrive.