

Toward the Establishment of the Engineering Physics Study Program within the Faculty of Electrical Engineering and Informatics in Hasanuddin University Makassar Indonesia

Rhiza S. Sadjad*

Control Systems and Instrumentation Laboratory, Department of Electrical Engineering
Faculty of Engineering, Hasanuddin University, MAKASSAR Indonesia 90245
Email: rhiza@unhas.ac.id, URL: <http://www.unhas.ac.id/rhiza/>

Abstract

Founded in 1963, the Department of Electrical Engineering Faculty of Engineering Hasanuddin University in Makassar INDONESIA has been around for almost 50 years now. Currently it is one of the largest departments in the university with more or less 700 students enrolled. The Department is on the way to grow itself into a new faculty consisting several study programs. This paper discusses the feasibility of establishing an Engineering Physics Study Program whose core field of teaching and research is focussing on the industrial process control systems and instrumentation.

I. INTRODUCTION

In relation to the Hasanuddin University's New Engineering Campus Development Project (JICA Loan No. IP-541), a research fellowship program has been offered to interested faculty members, arranged in a 6 (six) month visit to a university in Japan. This program is intended to enhance the concept of Laboratory-Based Education (LBE) that is planned to be implemented at the new campus. This paper is to describe my plan to participate in the program tentatively starting at the end of May or at the beginning of June 2012.

II. BACKGROUND

I was the chairman of the department in 2003 when I received a feedback from my former student who worked at an oil refinery plant. He told me that the control systems he dealt with in his daily work were very different from the control systems he learned during his study in the Department of Electrical Engineering at our university. It was really a surprise for me because to the best of my knowledge at that time, our curriculum was designed to conform with the international standard, and the syllabii for all Control Systems courses were derived from standard textbooks for Electrical Engineering. After a quick investigation, I realized that our former students who worked at physical plants of manufacturing companies were positioned more or less as process control engineers, rather than as electrical or electronic engineers. In fact, until now, our university - which is the largest and the oldest university in the eastern region of Indonesia - has no Department of Chemical Engineering nor Department of Engineering Physics that would have graduated process control engineers. Nevertheless, the surrounding industrial world in the eastern region of Indonesia, where our university is located, has positioned our electrical engineering graduates at the process control engineers' positions. Realizing this fact, I took an initiative to accommodate the subject of Process Control Systems and Technology in our Electrical Engineering curriculum, and became one of the features of our study program, both in our undergraduate as well as our graduate programs.

A couple of years ago I started to supervise a Ph.D. candidate to conduct a research project on the development of the miniature of a process control plant for solid materials [1]. The project was completed

in 2010 and the mini-plant is now installed at our laboratory as shown in Fig.1. Several undergraduate final projects and Masters' thesis were produced based on this Ph.D. project. I strongly believe that the field of research in the process control technology will open a wide opportunity for our department in its future new engineering campus.



Fig. 1. The Miniature of a Process Control Plant for Industrial Solid Materials

In 2004 our laboratory proposed to develop a large Process Control Training System consisting of several mini-plants originally created by Syntek Group, a process control specialist from Malaysia. The main goal of the development was to build an industrial training center on campus. We were very certain that such an industrial training center would open the gate to the collaboration between the academic world and the real industrial world. A set of boiler drum for temperature control is currently in the procurement process, funded by a central government's agency: the Ministry of Energy and Mineral Resources. Another set of air pressure and temperature control will be purchased through the Hasanuddin University's New Engineering Campus Development Project (JICA Loan No. IP-541) Package 2.

In the future, when our department moves to the new campus approximately in 2013 or 2014, our laboratory will not only be able to support the academic program of our department - the Laboratory-Based Education (LBE) program - but more than that, it will take its role as the important part of an industrial training center serving the industrial community in the surrounding area, the eastern region of Indonesia. In order to enhance our services - in terms of academics, research and public services - we are now proposing to expand our department into a much wider scope of a faculty. The proposed name of the new organization is the Faculty of Electrical Engineering and Informatics. In the future, the new faculty is planned to establish at least 4 (four) study programs, i.e. the existing Electrical Engineering and Informatic Engineering, and two additional study programs, the Computer System Engineering and the Engineering Physics (specializing in the Process Control Technology and Instrumentation) study programs, both are to be expanded from the existing Computer, Control and Electronic Sub-study Program. With this future plan bare clearly in mind, for this 6-month visiting program in Japan, I have made an intention to focus on two issues, firstly, to observe the Japanese university-industry research collaboration, and secondly, to survey the current curriculum development and research activities of some prominent Japanese universities, especially both in the fields of process control technology and instrumentation systems. The main result of this visit is a draft of the proposal to prepare for the establishment of the Engineering Physics study program within the future Faculty of Electrical Engineering and Informatics.

Japan has a long experience with the university-industry collaboration, especially in the field of process

control technology [2] [3]. The short visit to both the university and the industrial world in Japan will be very beneficial for the future of our laboratory at its location in the new campus. The main concern is about the university-industry collaboration itself, another concern is related to the LBE curriculum development of the proposed Engineering Physics study program.

III. OBJECTIVES

The main goal of the 6 (six) month visit to Japan is to collect the lessons learned from the Japanese experience in the collaboration between the academic world and the real industrial world, especially in the field of process control technology. The best model of university-industry collaboration will be developed as the main outcome of the visit, which is considered as the foundation of the establishment of the future Engineering Physics study program. The secondary goal is to survey the curriculum development and research activities of the Chemical Engineering and Engineering Physics Departments in some prominent universities in Japan, where the process control technology and instrumentation is their main competency. The visit will begin and end at the Tokyo Institute of Technology, Suzukakedai Campus at Yokohama, hosted by Professor Hiroya SEKI of the Process Systems Engineering Division, Chemical Resources Laboratory.

IV. SCHEDULE

Tentatively, the schedule of the visit can be arranged as shown in TABLE I. The first five days will be spent for orientation and preliminary discussions, fixing the details of the 6-month visiting program planning. For the next 2 months after my arrival I am planning to stay at the Suzukakedai Campus.

TABLE I
THE TENTATIVE SCHEDULE

Day 1 to Day 5	Orientation and preliminary discussion with the host professor at the TIT
June to July 2012	Staying and working at the TIT's Chemical Resources Laboratory
August to October 2012	Visiting industrial plants, research centers, etc. in the surrounding area
November 2012	Back to the university, writing reports and papers

From the third to the fifth month I would like to make a tour to visit the surrounding industrial world, industrial research and training centers and universities, where the university-industry collaboration on the field of process control technology and instrumentation is in progress. The final sixth month will be spent for writing reports and papers to conclude the visit program.

REFERENCES

- [1] Andani Ahmad, The Miniature of an Industrial Solid Material Process Plant, Ph.D. Dissertation, Hasanuddin University Graduate Program, Makassar, Indonesia, 2010.
- [2] Manabu Kano, Recent Development of Process Control Technology through Industry-University Collaboration in Japan , The 13th Asia Pacific Confederation of Chemical Engineering Congress , Taipei, Taiwan, October 5-8, 2010.
- [3] Kano M. and Ogawa M., The State of the Art in Advanced Chemical Process Control in Japan, IFAC ADCHEM, CD-ROM, Istanbul, Turkey, July 12-15, 2009



* Rhiza S. Sadjad, was born in 1957, completed his elementary and secondary education at his home town Bogor, Indonesia. He received his first college degree of Ir. from the Department of Electrical Engineering, Bandung Institute of Technology (ITB), Bandung, Indonesia in 1981, then received the M.S.E.E. (1989) and the Ph.D. (1994) majoring in Automatic Control Systems from the Department of Electrical and Computer Engineering, University of Wisconsin, Madison WI, USA. In 1981 he took a teaching position at the Faculty of Electrical Engineering, Satya Wacana Christian University in Salatiga, Central Java, Indonesia, then moved to the Department of Electrical Engineering, Hasanuddin University, Makassar, South Sulawesi, Indonesia in 1983 and has been with this department until now.. He founded the Control Systems and Instrumentation Laboratory in 1995 and has been the head of the laboratory since then. He teaches almost all courses in automatic control systems area, and has recently been interested in the process control systems and technology. He has supervised a Ph.D. dissertation (completed in 2010) to develop a process control mini-plant for industrial solid materials, and now is advising undergraduate and masters students whose final projects and thesis are related to the field of process control technology.