

NUCLEAR ENGINEERING AT THE UNIVERSITY OF NEW MEXICO

THE DECADE OF THE SEVENTIES

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February, 1982

The Nuclear Engineering program at UNM entered the decade of the seventies with a strong graduate program and faculty. There were six faculty members, among whom four had become tenured early in that decade. The program had a strong research and graduate education orientation and included much of the materials science research of the College of Engineering. The establishment of a program in Nuclear Engineering at the University of New Mexico was justified based on the presence of two of the country's nuclear research laboratories in the state of New Mexico, as well as the presence locally of significant nuclear industry. The Nuclear Engineering Department has during the decade maintained a graduate (M.S. and Ph.D. degree) orientation. This includes being among the top two degree-producing departments operating programs at the Los Alamos Graduate Center of UNM.

In the 1972-73 academic year the department was merged with the Chemical Engineering Department. Chemical Engineering was a smaller department with primarily an undergraduate education emphasis. At the time of the merger, there were two tenured faculty in Chemical Engineering, among five total faculty. Part of the purpose of the merger was to strengthen the Chemical Engineering program, with the expectation that it could develop an accredited undergraduate program as well as a research-oriented graduate program. The combination of able administration and high quality, newly recruited faculty, coupled with the growth in demand for ChE graduates, led to a dramatic improvement in the Chemical Engineering program over the next decade. The program is now strong at the graduate and undergraduate levels, with faculty having local and national visibility. The research program emphasizes energy research areas of vital local and national interest. Despite some faculty growth during that period, the weakness of the program continues to be in its size, lagging far behind programs at comparable regional universities.

During this time of outstanding success in improvement of the Chemical Engineering program, the Nuclear Engineering program was held in virtual stasis. The administration of the department (first Professor Whan, then Professor Long) and of the college (Deans Dove and Gross) seem to have been most concerned with the maturation of the ChE program. Because of that administrative emphasis, there was no concerted effort to continue the growth and development of the Nuclear Engineering program. The Nuclear Engineering faculty remained stable at around six faculty through the entire decade of the seventies. The appended table shows the development of the Nuclear Engineering faculty from 1970 to the present. Faculty

members are classified in groups which correspond to our present tenure structure of term/probation/tenure, although that particular system was not instituted at UNM until the mid-seventies. Departure of tenured faculty dropped the number of tenured NE's from four early in the seventies to one in the latter part of the decade. Of those tenured faculty who departed, most resigned to accept more attractive professional employment in the nuclear industry. The departure of a Nuclear Engineering faculty member who was department chairman in 1978 (Long), and his subsequent replacement by a Chemical Engineering chairman, caused further deterioration of the NE faculty strength. Nevertheless, by the 1981-82 academic year the faculty had returned to a level of six faculty, with half tenured.

It is noteworthy that the Nuclear Engineering faculty experienced a no-growth situation during the period from 1970 to 1981. During the same period some departments within the College experienced tremendous growth. (The Electrical Engineering Department, for example, doubled its faculty.) Some of the growth of other departments was surely due to increases in student enrollment. However, it is also clear that any growth in the ChNE department during that period was directed preferentially into the Chemical Engineering side of the program. While it was indeed essential to allow the ChE program to grow and develop, it is unfortunate that Nuclear Engineering was in effect penalized during the same period by being held static.

In the 1982-83 academic year the Nuclear Engineering faculty will expand to a size of seven faculty. I believe that this growth is in fact long overdue. The program has an active, research-oriented faculty with excellent national visibility. The areas of research emphasis among the faculty include traditional Nuclear Engineering, as well as Engineering Physics applied to such diverse fields as accelerators and plasmas. A significant fraction of the externally-funded research in the College of Engineering in the past half decade can be attributed to the Chemical and Nuclear Engineering faculty. The graduate program in NE remains strong, and the addition of an undergraduate program (with first graduate in 1981) assures the base of student credit hours to justify the program in the University's instructional budget. There is an active professional community voice in the direction of the program, through regular meetings of the faculty with an Advisory Committee on Nuclear Research, Education and Training. That committee contains managers and researchers in the nuclear profession throughout the state, who have an interest in the employment of Nuclear Engineers as well as the success of the program at UNM.

Part of the past success of the Nuclear Engineering program lies in the ability to draw on resources from the Chemical Engineering side of the Department. It would not have been possible to establish an undergraduate Nuclear Engineering degree without using engineering courses already taught within the College. In particular, fewer than half of the engineering courses in the undergraduate Nuclear Engineering curriculum are taught by NE faculty. The remainder are generally taught by the ChE faculty, allowing an optimization of the use of instructional resources within the department. Likewise, some of the graduate courses of the

Department are given jointly to Chemical and Nuclear Engineering students. Such sharing of the instructional load has made the marriage of Chemical Engineering and Nuclear Engineering in the ChNE Department a symbiotic relationship.

Even though the two programs have lived harmoniously in one department for the past decade, it is important to recognize the distinctive nature of the two programs. The Nuclear Engineering faculty meet separately to consider the NE curriculum and students, as do the Chemical Engineering faculty for the ChE program. The critical size needed to operate a department with nationally recognized programs is probably in excess of the number of faculty in either the Chemical or the Nuclear parts of the department. Seven faculty members is certainly marginal as a critical mass for the Nuclear Engineering faculty. Programs with national recognition and prestige (which we could become, if given the opportunity) typically have 10-14 faculty members. It is important to recognize in considering the need for additional resources that the Nuclear Engineering faculty has only seven members (not the entire Department complement of 14). If it is not possible to take this into account in determining resource allocation, it is not in the best interest of the two programs to remain united in one department. The need for growth to an effective base level would become more obvious for both programs, were they completely independent.

The need for a Nuclear Engineering program at UNM with regional and national visibility is easily established based on relative uniqueness of the program and the importance of the subject matter to the state of New Mexico. However, the continued vitality of the NE program at UNM will require a commitment to further growth. With that growth, the productivity of the NE faculty will continue to be exemplary within the College of Engineering.

NUCLEAR ENGINEERING FACULTY - UNM - HISTORICAL VIEW

1970-71	71-72	72-73	73-74	74-75	75-76	76-77
WHAN LONG HORAK EVERETT	WHAN LONG HORAK EVERETT	WHAN LONG HORAK EVERETT	WHAN LONG HORAK* EVERETT	WHAN LONG EVERETT	WHAN LONG EVERETT	WHAN LONG EVERETT*
HORAK EVERETT				LOGAN	LOGAN	LOGAN
LUCOFF O'DELL	LUCOFF O'DELL	LUCOFF* O'DELL*		KNIEF CRONENBERG	KNIEF CRONENBERG	KNIEF CRONENBERG* (BUSCH)
77-78	78-79	79-80	80-81	81-82	82-83	
WHAN LONG*	WHAN	WHAN	WHAN WOODALL	WHAN WOODALL ROBERTSON	WHAN WOODALL ROBERTSON	
LOGAN KNIEF	LOGAN* KNIEF ROBERTSON	KNIEF* ROBERTSON	ROBERTSON	HUMPHRIES	HUMPHRIES RODERICK COOPER	
WOODALL (NAKABAYASHI)	WOODALL COOPER (NAKABAYASHI)	WOODALL COOPER	COOPER	COOPER EL-GENK	EL-GENK	

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THE UNIVERSITY OF NEW MEXICO

DATE: February 12, 1982

TO: Dean, G. W. May, College of Engineering
Woodall
FROM: David M. Woodall, Chairman, Chemical & Nuclear Engineering Department
SUBJECT: Chemical and Nuclear Engineering at the University of New Mexico

I am enclosing for your information a pair of documents which I have prepared on our programs. These two brief papers are an effort to address the changes which have occurred in the Chemical Engineering and Nuclear Engineering programs during the past dozen years. I would appreciate any comments which you have concerning the content of the documents. I decided to prepare these because it seems that no one on the departmental faculty, with the exception of Glenn Whan, has a good perspective on what has happened here in Chemical Engineering and Nuclear Engineering during that period. I plan to circulate these papers to my departmental faculty for their comments. I also hope to use them to generate discussion at the spring meetings of our Departmental Advisory Committee and our Advisory Committee on Nuclear Research, Education and Training.

I have attempted to address the importance that I feel both the Chemical Engineering program and the Nuclear Engineering program have for the College of Engineering at UNM. I hope the information contained here is of assistance in the justification of an additional position for the future Chairman. The Chemical Engineering program needs those additional resources in order to approach the critical mass outlined in our five-year plan of 1980-85. It is noteworthy that our projected faculty size in 1983 is consistent with our expectations in that five-year plan, even with the addition of another CHE.

DNW:gyb
cc: Chemical & Nuclear Engineering Faculty