Federal Recruitment of Junior Engineers[1]

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ENGINEERING STUDENTS AND THEIR PROFESSORS challenge the personnel policies and procedures of federal agencies. June graduates, furthermore, found better-paying jobs awaiting them in industry than in government. Substantial changes in policy, procedure, and public relations are in order if federal agencies are to be in a favorable competitive position for obtaining young engineering talent.

These conclusions arise out of a study of attitudes of June graduates, deans of engineering schools, engineering professors, and placement officers in engineering colleges. The major purpose of the study was to determine the reason why engineering students did or did not apply for U. S. Civil Service Commission examinations in the fall and spring of 1950–51. High lights of the accumulated data relating to the specific problem, and more generally to engineering student attitudes toward federal employment, are summarized in this article.[2]

Campus visits were made to six engineering colleges in the eastern United States, selected to represent different environmental factors.[3] Students in civil, electrical, and mechanical engineering were asked to fill out questionnaires, and a sample number were interviewed individually. Deans of engineering schools, engineering professors, and placement officers were also interviewed.

The questionnaire. Students were asked to fill out a four-page questionnaire, which was administered in about twenty minutes. The questionnaire asked the student to check classificatory information, and to provide information relative to civil service examinations. Six statements of general attitude toward working in government compared with industry were included, and the students were asked to indicate their degree of agreement or disagreement on a five-place response scale. Finally, five open-end questions were asked relating to the students' opinion concerning advantages and disadvantages of federal and industrial employment in engineering.

Six hundred usable questionnaires were collected from 39.8% of students who were to graduate in June. Responses indicated a conscientious effort to be thoughtful and sincere in their answers.

Interviews. Seventy-six students were interviewed individually in open-end interviews lasting 10–75 minutes, with most interviews lasting about 15 minutes. Immediately following the interview, a written record of pertinent comments was made. As many as 16 different classifiable comments relating to student attitudes toward federal employment were noted in one interview. The average was 7.5 per interview.

Fifteen engineering professors were interviewed, and six others submitted written comments. Three deans of engineering colleges were interviewed, and a fourth submitted written comments. The notes made after each faculty interview were analyzed for attitudinal statements and such statements classified and tabulated.

Since the placement officer is often the focal point of campus recruitment, extensive interviews were held with placement office staffs at each of the six colleges One such interview yielded 31 classifiable attitudinal comments.

Analysis of the data. Most of the data collected were subject to statistical tabulation and analysis. Responses to open-end questions and interview comments were classified and tabulated by an inductively developed classification scheme of 88 categories. To facilitate analysis these categories were grouped into several areas of personnel administration to which they were related: recruitment and selection, position classification and pay, placement, training, management-worker relationships, separation and retirement, and miscellaneous.

Examination of interrelationships of data collected by student questionnaire and by student, faculty, and placement officer interview revealed no substantial conflicting testimony but a number of interesting variations in emphasis.[4]

[1] This article is based on the full report of a study conducted by The American University and supported by funds from the Manpower Branch, Human Resources Division, Office of Naval Research. George P. Bush was prineipal investigator and chairman of a university committee for the project, composed of Catheryn Seckler-Hudson, Lowell H. Hattery, Charles M. Hersh, and Robert T. Bower. An advisory committee of federal officials contributed to the planning of the study. The advisory committee was composed of Milton M. Mandell, U. S. Civil Service Commission, *chairman*; Ralph M. Hogan, Office of Naval Research; D. R. Hicks, Bureau of Reclamation; Charles W. Fotis and Lionel Murphy, Air Research and Development Command Headquarters; Raymond Randall and George Porter, National Bureau of Standards; William T. Pecora, U. S. Geological Survey; and Henry A. Sawchuck, U. S. Civil Service Commission.

[2] For a full report of findings, see G. P. Bush, *Engineering Students and Federal Employment.* Washington, D. C.: Am. Univ. (1951). Available on loan from R. M. Hogan, Manpower Branch, Human Resources Division, Office of Naval Research, Washington 25, D. C.

[3] College of the City of New York, Cornell University, Drexel Institute of Technology, North Carolina College of Agriculture and Engineering, Rensselaer Polytechnic Institute, and West Virgina University.

[4] Complete classification system and tabulations of the data are presented in the full report of the study.

Students Favor Industrial Work

In their agreement-disagreement response to six statements comparing government and industrial work, students showed a generally unfavorable attitude toward government. For example, students were asked to indicate their agreement or disagreement with the following statement:

> I would have greater opportunity for professional growth and development in government than in industry in my field.

Students were asked to check one of five degrees of agreement: strongly agree, tend to agree, neither agree nor disagree, tend to disagree, or strongly disagree. Of those who indicated strong agreement or disagreement, 13 strongly agreed and 202 strongly disagreed. Students felt, even more strongly, that the opportunity for *financial return* from a career in government was less favorable than from a career in industry. Four felt strongly that the *prestige* of government employment was higher than for industrial employment, whereas 194 felt strongly that prestige of government is less than industrial employment. Unfavorable attitudes toward government employment compared with industrial employment, though less strong, were nevertheless marked with respect to the *interesting nature of the work, contribution to engineering field,* and *training received.* Totals of responses to the six statements, which were composed in a form favorable to government employment over industrial employment were:

Strongly agree	71
Tend to agree	362
Neither agree nor disagree	773
Tend to disagree	1,382
Strongly disagree	974

Seventy-two students who had previous government employment experience showed little variation in their attitudes from those of the total group, though they were more favorable toward the interesting nature of the work in government, but less favorable toward government employment in terms of prestige.

Advantages and Disadvantages of Federal Employment

Students were queried both by questionnaire and by interview about their opinions concerning the advantages and disadvantages of federal and industrial employment. It was obvious in some cases that the student's opinion was not supported by fact; nevertheless, his opinion, even though specious, may be effective in his motivation.

Recruitment factors. Students mentioned *job security* as a factor favorable to government employment more often than any other. Job security was listed as an advantage by 336 students; job insecurity was listed as a disadvantage of industrial employment by 257 students. Fifty-six students, however, considered job insecurity a disadvantage of government, and 39 students considered job security an advantage of private industry.

Surprising to the investigators, in view of the federal civil service system, was the degree to which *political influence* was considered a disadvantage of federal employment. Eighty-four students referred to political influence as a disadvantage of federal employment with such remarks as: "There are too many political connections necessary . . . it's not what you know but who you know—in spite of apparent merit systems," "The top jobs are obtained through political influence," and "In the civil service you frequently reach a point where some politicians cross you up."

Location of the job, because of uncertainty or undesirability of location, was an unfavorable factor for federal employment. One student commented, "Federal employment would most likely take me from my desired working area; place me at some undesirable location. . . ." Another said, "It's virtually impossible to move and find housing when you have children."

There was indication that the students believe there is greater *variety of engineering jobs* in industry. Sixty-six students listed this factor as an advantage of industry, 16 listed lack of variety in kinds of jobs as a disadvantage of government. On the other hand, 32 students considered variety of positions an advantage of federal employment.

Pay. Throughout the study, *higher starting pay* and *higher pay in higher grades* were preponderant disadvantages of government and advantages of private employment. One student said simply, "Industrial offers of more money just can't be overlooked." That the pay differential is an actual deterrent to accepting federal employment was admitted by students in such comments as: "I would like to work for civil service, but the difference of $500–$800 in pay is too much;" and "I would have given much more consideration to the Naval research program had the starting salary been a little higher." More than half the students who filled out questionnaires cited pay as a disadvantage of federal employment.

Promotion. The government fared little better in the matter of promotion, which is, of course, related to pay. Only five students listed *promotion by merit* as an advantage of federal employment, contrasted with 96 students who considered the lack of it a disadvantage, and 117 who considered it an advantage of private employment. Some typical comments concerning federal promotion were: "Have lived most of life in D. C. . . . Have seen too many capable men stuck, half way up," "You have to wait for someone to die to get ahead in civil service," "The ambitious cannot rise in the civil service due to politics." The dean of an engineering school commented: "My son graduated from N. In a year he has had three jobs, each better than the last. How can a young man do this in government? If it can be done, then we on the outside are not told and hence presume that a person is stuck in his job once in."

Training. Training opportunities, through both formal training programs and experience, were rated

about even between federal and private employment. Most students who mentioned opportunities, funds, and facilities for research cited them as advantages of federal employment. This indicates that federal agencies engaged in research are in a more favorable position for recruiting engineering talent than other federal agencies. One student pointed out that, in his opinion, "government work is good only for research and development for engineers."

Unfavorable to government is the conception among a number of students that industry has regular training programs for junior engineers, whereas government does not.

Management and Working Conditions

Federal employment showed up well in student comments on *welfare* phases of working conditions, such as annual leave, sick leave, retirement provisions, short working hours, less pressure on employees, better equipment. For example, 168 commented on annual leave provisions as an advantage of government employment.

On the other hand, the tradition of red tape in government was strong among the students, 171 of whom cited *inefficiency of management* as a disadvantage of federal employment, whereas 124 cited efficiency of management as an advantage of private employment. Some typical comments about government management are: "Decisions can't be made and put through in a fast, efficient manner," "In my estimation the government has a reputation for . . . having incompetent supervisors," "I am not attracted to government service because of the seeming maze of red tape."

Several categories of student comments seemed to relate to *morale*. These included references to incentives, independence, restrictions and regimentation, prestige. Federal employment showed up unfavorably in this area, with a net of 139 citations of disadvantages in federal employment and a net of 140 citations favorable to private employment. Some comments: "Classmates look with scorn on anyone even considering government employment," "Federal employment does not stimulate initiative," "In general, individuality seems to be lost in government service."

Private enterprise. Student comments in interviews generally paralleled attitudes expressed in questionnaires. There was, however, distinctly greater emphasis on the issue of private enterprise versus government enterprise. The following remarks, taken from the interviewer's notes, are descriptive of attitudes expressed. "They [government jobs] do not interest me, because I am convinced that there are too many on government payrolls, and the free enterprise system may break down." "I don't believe in government jobs." "There is no background of civil service in my family, and I was headed for industry since I first came here." Student and faculty interviews suggest that children of parents employed in industry tend to prefer employment in industry and children of parents employed in government tend to prefer employment in government.

Faculty Attitudes

On the assumption that professors may influence students' attitudes and employment preferences, extensive interviews were held with faculty members at each of the engineering colleges, and several professors filled out a schedule listing advantages and disadvantages of federal and industrial employment.

Engineering deans and professors reflected a configuration of attitudes similar to that of their students. One departmental chairman, when asked to enumerate advantages of federal employment for a young electrical engineer, answered after some thought, "None." Engineering faculty stressed lower pay, lack of promotion by merit, and adverse morale factors as disadvantageous to federal employment.

Constructive suggestions were offered in several areas. More favorable *publicity* and *public relations* by federal agencies were stressed. Establishment of a *tradition* of going into public service was considered important to successful recruitment. And, of course, a competitive pay schedule was deemed essential. Although the majority of engineering faculty members were less favorably disposed to federal than to industrial employment for junior engineers, there was substantial evidence of conscientious attempts to bring federal employment opportunities to the attention of engineering students. One professor said, "I try to sell government service to my students."

Federal Recruitment Relations

Engineering deans and placement officers were frankly critical but sincerely constructive in discussing experience with direct recruitment by federal agency representatives. The apparent failure of government recruiters to recognize the autonomy of the school is the occasion for criticism on the part of several placement officers. Placement officers complained of (1) the manner of dealing with the college as though it were a land-grant college and (2) the fact that, having been given a scheduled time for interviews, government recruiters frequently arrived late or failed to appear.[5] In contrast, the recruiter from private industry first asked permission to visit the campus at the convenience of the college, and then meticulously met his interview schedule.

Another complaint against government recruiters is their inability to make a good personal impression either on the students or on the placement officers, through lack of knowledge of jobs for which they are recruiting, and lack of technical background in the field. As one placement officer expressed it: "Too many government recruiters are 'nice fellows' but spend too much time explaining 'sick leave' and don't

[5] From interview notes: "Both the placement officer and the students took on a decided anti-government stand when a government interview team from ——— failed to show up for scheduled interviews. This affected all 'government' not just ———."

know professional engineering." In contrast, one placement officer cited an instance in which the industry recruiter "is unusually tactful in his dealings with the placement office. He knows his company; he knows the way the placement office operates; he asks specifically for what he wants; and he gets the men. On occasion he will bring along a specialist from a particular plant."

Only two instances were cited as favorable to government recruiters. One military establishment "sent a four-man team composed of a personnel specialist, a civil engineering supervisor, a mechanical engineering supervisor, and an electrical engineering supervisor. The personnel man interviewed first on personnel matters, and the subject matter interview followed. This seemed an excellent procedure to the placement officers."

Placement officers of all the schools were impressed with the lack of organization of government recruiters after their arrival on the campus. Their interviews were not well planned. They demanded interview schedules on short notice, and no definite jobs were offered. In one instance, on request of a federal agency, 350 students with the help of the placement officer filled out Civil Service Commission Form No. 57 for summer employment and delivered the completed forms to the government installation in person. Up to the time of interview no student had received an offer of employment. Apparently the agency had retrenched in its summer employment policy.

A particularly bad impression was made upon placement officers by one team of federal recruiters. A placement officer reported, "One [recruiter] was cocky, the other three pleasant to deal with. They wanted to interview students on very short notice. . . . Evidently they were not experienced with campus contacts." In contrast, one company in private industry sent the company plane to the campus, picked up four interviewees and a member of the placement office staff and flew them to the home office and back: "All interviewees are signing up."

Appeal of Civil Service Announcements

Of 339 students who saw the announcement of the U. S. Civil Service Commission examination for junior scientists and engineers dated October 1950,[6] 41 students took the examination. Thirty-nine students had been notified they were on the register as having passed the examination.

Competitive Recruitment: A Frame of Reference

There is a shortage of junior engineers, and competition exists for the available supply, especially for those of greatest talent and ability. The federal government has a large demand for junior engineers to man its numerous projects. Some of them can be run of the mine, but others must possess outstanding talent and ability. Industry also needs engineers. The armed forces need engineers for military service. Industry assiduously combs the campus for recruits, and the federal government through its announcements and recruiters attempts to get its share of the graduates.

In this milieu we find the student subject to three principal recruiting systems: the military services, industry, and the federal government. There are other avenues into which the student may go, such as continued education, teaching, state or municipal government. The student choice is affected by the relative advantages and disadvantages, either real or fancied, of available employment. The study indicates certain attitudinal factors which seem to deter students from entering federal employment, and which decrease the effectiveness of government recruitment.

Some of the adverse factors, such as lack of prestige in federal employment, can be changed only slowly. Political influence as a deterrent may or may not be amenable to correction. Other factors could readily be changed once their importance is properly appreciated. The study indicates deficiencies in the policies, organization, and methods of federal recruitment, many of which could be substantially improved. Some adverse attitudes toward federal employment for engineers are based on at least partial misconceptions. This indicates the need for a better flow of information about federal employment opportunities to engineering faculties and students.

So far as junior engineers are concerned, the government is in an adverse competitive position. "Security" and "benefits" in federal employment are important, but there are many other factors that tend to offset or cancel out these familiar standbys.

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[6] U. S. Civil Service Commission Announcement No. 250, dated October 17, 1950.

[7] For an indexed bibliography see the full report of the study.