

Chapter 4

Introduction

Developing your career, whether it is in the Commissioned Corps (CC) or Civil Service (CS) personnel systems, involves the same basic principles. Each system has significant differences that can be used to your advantage. This chapter (and Chapter 5) will outline some of those distinctions. For example, CS engineers may have greater control over their assignments and can more readily move back and forth between the private sector, academia, and government. Although CC engineers are less likely to cycle in and out of government service and may be subject to unplanned assignment changes, they may have more opportunities available to them within the government, e.g., details to the Department of Defense, the Environmental Protection Agency, National Park Service or the Coast Guard. Also CC personnel can often retire from government service at an earlier age to begin a second full career. In either case, engineers and architects in both systems require a base of knowledge and must **plan** their careers to be successful. This chapter emphasizes knowledge and planning.

Career planning is the deliberate, systematic process by which an engineer – or any professional – charts and progresses through a series of work experiences that ultimately leads to the career goal he or she has predetermined. As an engineer, you have a great advantage. Equipped by education with an orderly, logical, thought process, you understand that obtaining any desired result, whether building a hospital or developing a medical device, requires careful planning and the application of basic scientific information under established criteria. That same approach is the key to successful career planning, if you do not know where you are going how will you know whether you get there or not. A detailed plan will help you track progress.

Begin by creating a career file, which you will maintain throughout your professional career. Your file should contain your career plan and revisions to it, all job-related documents including old resumes, job descriptions, certificates, diplomas, personnel action forms, commendation letters, work samples, notes, etc.

Part 1 - Developing Your Career Plan

Your career plan should be a written document. There are several advantages to this.

- Preparing a written document requires the use of a deliberate thought process to identify the types of positions, additional education, and professional accomplishments necessary to achieve a desired career goal. The plan should include the positions and desired dates to be in those positions.
- A written plan remains available as years pass to serve as a means of assessing progress. You probably will not follow your plan throughout your career. Indeed, most plans are revised many times. Nevertheless, a written plan stimulates

efforts toward career development by signaling the advisability of seeking additional training and/or more responsible positions.

- The likelihood of favorable consideration for training support is enhanced when it can be shown that the training requested is an integral part of a long-range plan.

Your plan may also include goals for a post-retirement career. It may be difficult for entry-level engineers to conceptualize a second career that is 20 or 30 years in the future, but as retirement nears, you should take steps to ensure a smooth transition if a second career is planned.

There are no short-cuts in career planning. If you want something more than “just a job,” you must be prepared for a process that requires **time, thought, and action**. Properly applied, these factors will ensure that your career uses your abilities and interests at the highest possible level. It is a good practice to share the plan with your supervisor and other senior officers.

Part 2 – Six Steps to Career Planning

Step 1: Taking Charge

You are responsible for your career. You cannot rely on others or the organization for which you work to plan and promote your career for you.

Career planning is hard work, but it can be rewarding. Without the potential rewards, you may not be sufficiently motivated to carry out the tasks associated with the planning process. Ask yourself these five questions. **Write down the answers.**

- Why did you choose engineering as a profession?
- What competencies and skills do you possess that make you especially suited to engineering? To the Public Health Service?
- What are the rewards and drawbacks of working in your present assignment?
- Where is your career headed, and how is it being directed?
- Is this what you really want to be doing? Is there something else that may look attractive?

It is important that you write down the answers to these questions and that you review them periodically. As time passes, attitudes and perspectives change. The answers that you give today may be entirely different in 5 or 10 years.

Step 2: Self Assessment/Life Concerns

To develop the best possible match between yourself and the available career options, you must begin with a thorough knowledge of yourself. Career planning and life

planning are inseparable. Ask yourself three questions. ***Again, write down the answers.*** Because the answers to these questions will provide the information you need about yourself for your career plan, it is important to fully explore each question and any attendant issues it raises.

Interests, values, and skills change with the passage of time. So think not only about where you are now and how you feel, but about where you would like to be and how you may feel in the future.

1. What are my work values?

A wide range of values can be actualized in any career. What kinds of activities do you enjoy during a typical work day? What kinds of hours do you work? What kinds of hours would you prefer? Do you prefer working alone, or with others? Do you enjoy challenging problems? What sorts of situations and/or assignments do you generally avoid? It is helpful to also consider the negative aspects of all these questions, i.e., what don't you enjoy in those activities.

2. What are my skills?

There are three categories of career skills: work competency, functional, and personal. List at least five attributes that you have in each category. Work competency is a knowledge of specific procedures, languages, or subjects, e.g., designing a software package, servicing a machine, etc. Functional skills involve the basics of dealing with data, people, and/or things, e.g., coordinating, communicating, etc. These skills are transferable. If you are good at them in one position, you will probably be good at them in another. Personal skills are values or character traits, e.g., dependability, punctuality, etc.

3. What are my interests and relationships?

When considering your future, remember also that none of us exists in a vacuum. Your career is a part of your life, a life that consists of other interests and that is inextricably tied to others – spouse, children, parents, etc. How will what you do now change your life and affect others in 5 or 10 years? As a point of departure, make a list of life planning considerations similar to the one below. Your interests and relationships will provide insight into the lifestyle most satisfying to you. Career gratification begins with a job that is compatible with your interests and relationships. Prioritize your list according to your own personal views.

The following is a Partial List of Life Planning Considerations:

- Affiliations: Clubs, professional organizations, political groups
- Dignity: Self-respect, self-esteem, integrity
- Education: Graduate school, developing new skills

- Employer Requirements: commitments, benefits, travel, experience, transfers
- Family: Marriage, having children, educating children, spouse's career, caring for elders
- Finances: Salary, budget, savings, investments, spouse's income
- Health: Diet, exercise, stress level
- Location: Rural or metropolitan, dry or wet climate, warm or cold temperatures, proximity to extended family, interests, etc.
- Professional Growth: Choosing a direction, designing and preparing for a profession, promoting yourself publicly (journal articles, professional registration)
- Social Life: Friends, colleagues, establishing trust and partnership, developing social skills
- Spirituality: Religion, poetry, humor, philosophy, art, a sense of peace

All of the considerations listed here may not be of particular significance in your life. Add or subtract items as you see fit to ensure that the list is completely relevant to you.

Step 3: Assessing Your Professional Interests in PHS

Engineers in the Public Health Service have a wide variety of assignments from which to choose. Each assignment requires different skills and knowledge. Identifying your personal and professional interests will help you to decide which of the following categories best suits you now and in the future. Detailed descriptions of these and other categories are provided in Chapter 3. Initially, you may be considering a functional category. Later, however, you may choose to develop additional technical expertise or to go into administration. All of these options are discussed below.

Research

PHS engineers participate in and conduct many types of scientific research and reviews. These engineers are experts in scientific method and generally like to observe, learn, and analyze. Research in the PHS typically involves rigorous systematic, critical, and intensive investigation directed toward development of new or fuller scientific applications. The work also involves theoretical, taxonomic, and experimental investigations or simulation of experiments.

PHS engineers may help to plan, develop, and implement testing programs and protocols in the areas of physical science and engineering. Such tasks frequently include developing, modifying, and calibrating scientific instruments

and equipment. PHS engineers may also create new materials, devices, processes, techniques, etc., for public health applications or problems.

Regulatory Compliance

When assigned to regulatory Agencies, PHS engineers may assist in criteria and standards development or regulatory compliance enforcement.

Criteria and standards development includes the development, review, and modification of Agency guidelines, criteria, and performance standards, and the review of standards proposed from outside PHS, e.g., the states. This type of assignment requires familiarity with existing regulations and laws, and the ability to coordinate the development, review, and approval of national standards with technical and legal professionals having diverse opinions.

Compliance enforcement includes managing or coordinating activities associated with public health regulatory actions. Such activities include, but are not limited to, products testing, inspections, seizures, shutdowns, takeovers, and banning actions against manufacturing operations, drinking water plants, and/or pollution control facilities. Engineers assigned in this category generally spend many hours in the field conducting inspections and must, therefore, possess tact and diplomacy along with their other skills.

Facilities Engineering

PHS engineers participate in the planning, design, construction, renovation, and management of hospitals, research facilities, and pollution control and drinking water facilities. Because this option encompasses many of the traditional engineering skills taught in college, it is frequently the starting point for entry-level engineers in the PHS.

PHS facilities engineers develop drawings and specifications and may be involved in troubleshooting hydraulic, mechanical, or electrical systems. PHS facilities engineers can be found in rural hospitals and clinics as well as major biomedical research facilities. These engineers also manage design and construction contracts and often interface with private sector engineers involved in the same type of work. PHS engineers also participate in the evaluation and remediation of hazardous waste sites and provide support for health scientists in determining the public health implications of such sites.

Billets and position descriptions for senior facilities engineers often require professional registration, which is discussed in detail in Chapter 6.

Technical vs. Administration Career Paths

Career growth within the PHS can be achieved along one of two paths. You may develop a high degree of expertise in a relatively specialized technical field or

you may steer your career toward program management, which requires a broader base of knowledge supplemented by training and experience in management topics.

It is very rare for an engineering graduate to begin his or her career in an administrative position. After some years of experience, a PHS engineer may have to choose between concentrated technical expertise and a managerial or administrative position. Each of these career paths has many advantages and opportunities. Either can be achieved within each of the three primary categories just described.

While most engineers have strong technical abilities, not all engineers have the skills necessary for a successful management career. Ask yourself this: Am I technically oriented or management oriented? Think about your motivations and how you wish to be respected in your profession. A detailed discussion of engineers in management is presented later in this chapter.

For the technical expert, satisfaction comes from the challenge presented by the work itself. Typically, technical experts seek recognition for their contributions to the technological state-of-the-art. Such recognition can come from other technical professionals as well as the broader professional community. In the arena of the technical expert, loyalty to the profession may outweigh loyalty to the Agency. Although they tend to avoid purely administrative work, technical experts will accept project management responsibilities, provided they can be kept close to the technical "action."

There is some risk associated with over specialization. Extremely narrow technical abilities can be a hindrance to advancement within the PHS. Those engineers who possess strong verbal and interpersonal skills may wish to advance towards the top of the organization where they can enjoy the visibility and influence that frequently accompanies the responsibility of managerial and/or administrative positions. Motivated by a broader sense of accomplishment and a desire to see programs succeed, administrators typically maintain technical proficiency as required. Unlike the technical expert, the administrator generally obtains respect for rank and position rather than technical ability.

Step 4: Career Investigation and Information Gathering

Several formal and informal means are available to the PHS Engineer for investigating various types of positions and career paths within the PHS.

PHS Organizations

Some organizations can assist PHS engineers with career planning development.

- The Office of the Chief Engineer makes career counseling available to Commissioned Corps Engineers. The Chief Engineer or their designee can review your Official Personnel File (OPF) with you, provide advice on career paths, answer questions about commissioned corps policies and procedures, and when necessary, be your advocate. You can find more information about the Office of the Chief Engineer at the PHS Engineer's home page at: www.usphsengineers.org
- The Engineer Professional Advisory Committee (EPAC) meets regularly to discuss issues of significance to PHS engineers and makes recommendations to the Chief Engineer. The EPAC is comprised of 20 engineers or architects (Civil Service and Commissioned Corps). They represent the EPA, NPS and each of the PHS Agencies with a significant number of engineers. The EPAC representative from your Agency can be an excellent source for current information. A member list of agency representatives is also located on the PHS Engineer's Home Page.
- The Engineer Professional Advisory Committee's Mentoring Subcommittee can also help you find an experienced senior engineer or architect to help you with your career planning. Contact information for the Mentoring Subcommittee is available on the PHS Engineer's Homepage.
- As an advocate for all PHS engineers, the Chief Engineer of the Public Health Service routinely advises the Surgeon General and others on issues affecting PHS engineers. Typically, the Chief Engineer is not available for counseling; however, his or her assistant may field or answer questions.
- To bring PHS engineers together, the EPAC and Office of the Chief Engineer frequently sponsors events such as the junior officer conference call, Engineer and Architect Leadership Development Seminars, COA Engineer's Symposium and various social events. These functions are particularly valuable for obtaining first-hand information on the various PHS engineering and architectural programs. These seminars also represent an excellent opportunity to meet and hear program managers from throughout the Agencies. Because nomination and support for seminar attendance are the responsibility of the employing programs, make sure your supervisor is aware of your interest in attending.

- Information on engineering program activities and vacancies is available from PHS Agency personnel offices. Vacancy information can also be found at Federal Job Websites like www.usajobs.opm.gov. Additionally, commissioned corps officers can find a listing of currently available jobs at the DCP web site: <http://dcp.psc.gov/Jobs.asp>.

Networking

Beyond formal information sources, you should develop your own network of PHS contacts. Typically, these contacts are people you know and can contact to obtain information about career opportunities. The value of this network cannot be overestimated not only in career planning but in other aspects of your job as well.

We practice networking in other areas of our lives, many times without thinking about it. Asking coworkers or neighbors for referrals for plumbers or physicians is a form of networking. Mobility, early in your career, is one of the best methods for building a network of contacts throughout PHS. A variety of assignments ensures that you will meet and get to know a variety of people – and they will get to know you. Over the years, as these people move into different assignments and perhaps advance into more responsible positions, they will be your most powerful sources of information about career opportunities throughout the PHS.

Joining organizations, associations, societies, and/or clubs is another excellent way to build your network. For example, you will meet other PHS engineers by participating in EPAC or in the Commissioned Officers Association (COA). Professional conferences, lectures, and seminars are also good sources for contacts.

Compile a list of the people you currently know who could provide you with information on possible positions and opportunities. When the list is complete, put it in your career file. Be sure to update the list as you make new contacts. You will be surprised, not only at how many sources you currently have, but at how fast the list will grow.

EPAC Mentoring Program

The EPAC considers mentoring to be a vital component of career development and enhancement. A strong, viable mentoring program will not only strengthen the career potential of our architects and engineers, it is key to developing competent and confident leaders that will face the public health challenges of the 21st century. The EPAC developed and implemented a pilot mentoring program for USPHS architects and engineers in 1996. The pilot program has been evaluated and modified based on input from the participants. The revised program is now available to architects and engineers who feel they would benefit from being a mentor or a protégé. Detailed information on the Mentoring Program can be found via the PHS Engineer's home page at:

<http://www.usphsengineers.org/Mentoring/menthome.htm>

The goals of the EPAC mentoring program are:

- To foster cross-organizational communications and share institutional knowledge
- To affirm the commitment to people and their development at every level of the PHS

- To provide protégés with the ways and means to promote an enhanced professional experience and upward mobility within the Public Health Service
- To provide mentors with an opportunity to develop new skills, and see different viewpoints.

Step 5: Career Decision and Goal Setting

The importance of making the right career decision and setting attendant goals cannot be overemphasized. The following information is designed to help you in your approach to these tasks.

Career Decision

Now is the time to begin making career decisions. Career decision making is a continuous process that includes:

1. Identifying the decision to be made.

Is your current position a “dead end?” Are you bored or stressed? Do you feel that your contribution to your branch or division is unrecognized? Do you feel you are capable of increased responsibility?

It may be time for a transfer, or time to expand your knowledge base to include expertise in another engineering discipline, thus making yourself more marketable. It may also be time for changes in other areas of your life. Consider the following options:

- Restructure your current position. Progress and planning review sessions with your supervisor may provide an opportunity to reshape your job to your satisfaction. Your supervisor may not be aware of your desire to assume a different set of responsibilities. Create new assignments for yourself by examining the work of your branch or section. Then take this initiative and the resultant proposals to your supervisor and convince him or her that these changes would not only benefit you but your supervisor and the organization as a whole.
- Change jobs within the PHS. You may want a different assignment within the same Agency/OPDIV or a transfer to another Agency/OPDIV. Another assignment will provide new challenges, responsibilities, and experiences as well as new supervisors, coworkers, and a new work setting. Compare these to your present assignment. You should consider staying in any one location for a minimum of two years. This will give you an opportunity to establish a sense of permanency and provide professional growth for your career.
- Change yourself. Sometimes you do not need to change your job to improve your situation. You may need to change your attitude or your work style and get additional training. For example, practice work stress reduction techniques. Consider changing some other aspect of your life such as leisure and/or family activities.

- Change your area of concentration. Consider additional training or education in another engineering discipline, or even outside of engineering.
2. Gathering Information. If you have followed the guidelines in Steps 1 through 4, you have already collected a significant amount of information about yourself, your professional interests, and career options.
 3. Weighing the Evidence. Ask yourself: If I do this, what will be the outcome? If I do not do this, what will be the outcome? How accurate is the information I have? Is there a more attractive (or better) alternative?
 4. Choosing Your Path. Make a choice. Remember that no decision is completely irreversible. Conversely, making no decisions allows others to make them for you.
 5. Taking Action. Make your choice a reality.

Goal Setting

A career goal is an overall goal reached by accomplishing a series of achievable intermediate goals called benchmarks (not all goals are, or should be, reached - if they are they may not have been lofty enough). The dictionary defines a benchmark as “a point of reference from which measurements of any sort may be made”. This definition is particularly well suited to the career planning process. By providing order and direction for your energies, benchmarks become the landmarks that tell you where you have been and where you expect to go.

Right now you are in the process of establishing your career goals. Make a list of benchmarks by which to judge your progress. This list is an essential part of your career plan. It is a working document and as such should be reviewed regularly, perhaps every three months, to assess your progress and to decide if the list needs to be amended as milestones are achieved and other goals established. It is important that you establish short-term goals (1 month - 1 year), intermediate goals (6 months - 3 years), long-term goals (1 year - 5 years), and beyond. Without these various goals you will not be able to map your progress or know when you have succeeded.

The following list is provided only as a sample to raise considerations that might otherwise be overlooked. The relative importance or applicability of these benchmarks will vary from individual to individual. The numerical sequence is not absolute nor necessarily chronological. Benchmarks eight through sixteen may not be strict measures of professional development per se; however, they do indicate significant career progress.

List of Possible Benchmarks (*Not necessarily a recommended chronological order*)

1. Orientation to the Public Health Service and Public Health Service engineering programs.
2. Fundamentals of Engineering (Engineer-in-Training) registration.

3. Progressively more responsible work assignments in PHS engineering activities.
4. Technical publications.
5. Work assignments in PHS research and/or development activities.
6. Continuing education courses in a technical specialty and/or administration and management.
7. Supervisory assignments in engineering research and/or development activities.
8. Awards and/or medals for work achievements.
9. Graduate training for a Masters Degree and/or a Ph.D.
10. Work assignments in supervisory activities and/or positions of authority.
11. Professional registration (See Chapter 6).
12. Participation in professional organizations and seminars.
13. Assignments in charge of segments of program activities of increased responsibility, importance, and/or scope, e.g., Section Chief, Branch Chief, Assistant to Division Chief, and more complex or significant research efforts.
14. Advanced professional certification in a technical specialty, e.g., Diplomate in American Academy of Environmental Engineers (See Chapter 6).
15. Publication in national and international journals of material significant to the promotion of national health and environmental programs.
16. Awards and/or medals in recognition of exceptional professional competence.
17. Postdoctoral education.
18. Increased responsibility and participation in professional organizations as an officer, chairman of technical committee, seminar director, etc.
19. Assignments in advisory and/or consultant positions as a recognized authority on broad program areas or an intensely specialized area of considerable uniqueness and importance.
20. Assignments and/or recognition as a research specialist in the formulation and guidance of attacks on problems of exceptional difficulty and of marked importance to the program organization or industry.
21. Assignments to top level positions that entail responsibility for entire programs and/or important segments of highly diversified and extensive program activities.

Assignment Types and Duration

Once you have identified an ultimate career goal and begun a specific, written career plan, with benchmarks, you are ready to evaluate positions that: (1) satisfy your plan, (2) contribute to your professional development, and (3) benefit the Agency for whom you will be working.

Initial positions should be two to three years in duration. Subsequently, more complex positions may last four to five years each. Short assignments in several different program areas provide enough time for you to learn the fundamentals and gain a general knowledge of the mission and function of the program. Entry-level engineers can usually make changes easily; however, it becomes harder to identify suitable positions if the job change is delayed too long. If there are no assignments available at the time, an increase in responsibility should be pursued. Typically, individuals are considered too advanced for most entry-level positions after six years. Conversely, they are not advanced enough to go directly into a senior-level position in another program, especially an established program. It may be easier to advance in a new and growing program.

Although the length of time in each position will vary according to the needs of the specific program, the overall philosophy of the Commissioned Corps is one of increasing responsibility and mobility. If you are reluctant to relocate during your career, the Civil Service personnel system is the more appropriate mechanism for you. PHS programs may involuntarily reassign any Civil Service employee (within certain limitations) or commissioned officer to meet current staffing needs; however, this is more likely to affect a commissioned officer than a Civil Service employee. You may enhance your career by taking one headquarters (administrative) position. Should you later decide on a career goal with a specific Agency, one or two positions in related program areas of other Agencies will be valuable to broaden your knowledge base and interagency understanding.

Step 6: Strategies for Changing Positions within PHS

Obtaining a desirable position within the PHS can be challenging and competitive. Although credentials are useful, the candidate with the most credentials is not always the one who gets the job. The candidate who has planned well, outlined and implemented a strategy, and remained flexible will frequently be the one who succeeds. To obtain another position you must learn about a desirable vacancy, apply for it, and be selected for it.

Finding a Desirable Position

If you have completed the work outlined in Steps 1 through 5, you have already:

- Identified your interests and professional abilities,
- Gathered information on various types of opportunities,
- Familiarized yourself with the overall structure of the PHS and its use of engineers,
- Created a career plan with an ultimate goal and intermediate benchmarks.

Having completed these tasks, you may decide that now is the time to look for another PHS engineering position. This may be the first step in implementing your career plan.

But perhaps your plan does not include moving to another position right away. That is certainly acceptable. Remember, however, that it is highly unlikely that the ideal position will become available at a time that coincides exactly with your career plan. Always be flexible enough to seize an opportunity whenever it arises.

As you begin to investigate possible positions, avoid the temptation to panic if nothing you desire is currently available. Here are some helpful considerations.

1. Job vacancies are not always advertised, or the advertising may be limited. Advertising depends on the policies of the Agency. If the vacancies are advertised, the Agency will use the Civil Service personnel system and/or the Division of Commissioned Personnel vacancies database web site: <http://dcp.psc.gov/Jobs.asp>. From this web site there are links to other Agency vacancy announcements. Some PHS (DHHS) Agencies may not advertise a particular vacancy at all or they may limit the announcement to a very narrow circulation. This is where your network of contacts becomes invaluable for possible leads.
2. The Division of Commissioned Personnel (DCP) distributes certain job advertisements to those subscribed to the Commissioned Corps Vacancies List Serve. You can sign up for this list serve at: http://dcp.psc.gov/v_maillist.asp.
3. Most Agency personnel offices can provide vacancy information which should be reviewed periodically. These vacancies can usually be filled by Civil Service or Commissioned Corps applicants. Applicants should submit a letter of interest with an attached résumé to the personnel office that issued the announcement. A vacancy announcement may require additional submittals such as a knowledge, skills and abilities (KSA) statement which all applicants should submit.
4. A formal vacancy announcement may not have been prepared as yet. Perhaps the job is not yet vacant, but the person currently in the position is planning to transfer or retire in the near future. Contact the supervisor **now** to express your interest in the position and to request a vacancy announcement when it becomes available. You may even wish to send a résumé to the supervisor **now**.
5. Vacancy announcements are not always an accurate reflection of the position. Suppose, for example, an Agency is looking for an engineer to design a solid waste incinerator. The Agency may advertise the position as a generic environmental engineer vacancy. Although a contact person is usually given on the vacancy announcement as the person to call for more information, it is best to talk with the person who will be supervising the position.
6. Finally, it is always possible that there are no desirable positions available right now. This should not prevent you from contacting potential employers. A résumé delivered to a potential supervisor may be circulated and filed for the moment, but if a position becomes available later on, you may be the first to know and your prior interest could be an advantage in the selection process.

Getting the Desired Job

Once you have identified the position you are interested in, be prepared to work very hard to get it. Again, prior planning is the key element to success. If you have already studied the requirements for the position and thoroughly familiarized yourself with the Agency and/or program, you will be able to act fast and decisively. You should:

- Have an up-to-date résumé ready to use. (Take a résumé writing course.) The closing date on the vacancy may be only one or two days away by the time you find out about it. This gives you very little time to react.
- Find out who will be making the selection. Make yourself available for an interview, but do not badger the selecting official during the selection process.
- Prepare and practice for the interview. Review your research on the organization and the specific position available. Know your career goals. Dress appropriately. Ask questions and give honest answers. If you still do not feel at ease, your local library has many books on successful interview strategies and techniques.
- After the interview, contact the person who interviewed you to: (1) thank them for the opportunity for an interview, and (2) find out when a decision will be made. This is a good professional practice. Even if you are not selected for this position, a follow-up call or personal note could ensure that you are considered in the future should another position become available

Part 3 - Technical vs. Management Career Paths

Engineers are sometimes promoted into management positions solely on the basis of good technical performance and with no thought to the capabilities that are required in a good manager. It is the non-technical factors, such as inept communication, inflexibility, and an inability to delegate, that can make the transition to management unsuccessful and unsatisfying.

To avoid the possible pitfalls in such a transition, begin with an assessment of your managerial capabilities. First, consider the fact that moving into management may mean foregoing a primary source of professional satisfaction – technical involvement. Because it is difficult to be objective about yourself, your next step is to obtain opinions from colleagues and friends who can be trusted to give you an honest opinion (and not just say the things you may wish to hear!). Ask for their thoughts in the following areas:

Problem Solving Skills

Have you shown an ability to handle ill-defined problems and live with a certain amount of ambiguity? Can you integrate emotional and intuitive data into your decision-making process? Do you maintain an acceptably broad gauge in dealing with new or unusual problems, or do you stick to the security of known procedures and tried-and-true methods? How good is your judgment?

Emotional and Motivational Patterns

Are you essentially stable, i.e., not prone to significant peaks and valleys, neither highly volatile nor overly emotional? Do you trust others enough to delegate? Do you have the self-confidence to move from responsibilities that have provided you with security and success to more nebulous and ill-defined areas? Do you have the energy and resilience to handle setbacks?

Interpersonal Style

Do you communicate effectively? Do you have good interpersonal skills? Do you build and maintain good relationships? Do you have the respect of your peers? Can you operate in an open, accepting, and non-defensive manner when dealing with other people?

Insight

Do you understand yourself and your motivations? Do you have the ability to empathize, tolerate, and understand others? Can you accept your own shortcomings as well as those of others? Are you aware of your own needs for growth, development, and improvement? Can you recognize similar needs in others and assist them?

Approach to Work

Are you willing to take responsibility while simultaneously giving up some control? Can you work with others? Can you fit into a teamwork environment? Can you handle conflict productively? Can you handle negative situations and make difficult “people” decisions when needed? Could you seek opinions, ideas, and support from your subordinates as well as from peers and superiors?

Are you flexible, i.e., can you integrate new information and ideas, discard your own ideas when proven faulty, and support and encourage others to do the same? Can you confront other people when they are not performing?

In his book, *Careers in Engineering and Technology*, George C. Beakley states: “The engineer in management is concerned more intimately with long range effects of policy decisions. Where the engineer considers first the technical phases of a project, the engineer in management must consider how a particular decision will affect the employees who work to produce a product. The engineer in management must have the ability to reduce a large number of variables to the most significant factors and then move decisively to a plan of action. “

If engineering can be described as more science than art, clearly good management is more art than science. While the two disciplines are by no means mutually exclusive, they do require very different types of expertise and perspective. Engineering is based on physical laws and predictable behavior. Management is based on people and the various factors that cause people to behave less predictably. This means that

engineering training and management training focus on the development of entirely different types of thinking and problem solving skills.

In describing an engineer, we use words such as practical, logical thinker, cautious, detail-oriented, and problem-solver. Words we use to describe a good manager include broad thinker, quick decision maker, motivational leader, delegator, and strategist. Clearly, not all of these characteristics will exist in one individual; however, the proper mix of these qualities is critical for the engineer who wishes to succeed, and excel, as a manager.

In *Your Career in Engineering*, William F. Shanahan states: "It is the job of engineers in management to get results through others. If they like and understand people, they can make excellent managers."

Transition to management is by no means impossible, but you should be aware of the problems that can surface as a result of that decision. In *Managing Your Career Success*, Terry D. Schmidt lists sixteen skills that can be helpful for the engineer who moves into management.

- Be well-grounded in the fundamental technology of a specific field;
- Know how to apply techniques;
- Have professional knowledge in areas related to your specific field;
- Understand organizational goals, structure, relationships, and procedures;
- Understand budgeting, cost estimating, and cost-control techniques and procedures;
- Know the informal means (and restrictions) applicable to the full range of personnel activities from recruitment through separation;
- Be familiar with and have the ability to handle constituent or professional group interests, interagency problems or relations, interested officials from other component organizations within the agency, organizational politics;
- Communicate ideas effectively;
- Work well with people with diverse abilities and temperaments;
- Know how to coordinate, facilitate, and negotiate group efforts;
- Possess a leadership style that draws positive responses from subordinates;
- Have the ability to gain the confidence of superiors;
- Accurately perceive and assess relationships;
- Identify and define critical issues with a view toward developing potential solutions;
- Have the ability to make decisions;
- Be capable of creative thinking.

Engineers can be effective managers depending on their desire to learn and to work with and understand people. Engineers already possess the aptitude for successful program and personnel management, but may need to learn and properly implement new skills. Management may not be the best choice for everyone. You can become a manager because you have a strong desire and potential to manage or you just think you might like it. If you do decide to move into management, it would be wise to, at least, seek management training and probably wisest to obtain a management degree. There are many different options available, e.g., Engineering Management, Management of

Technology, Masters of Public Administration, etc. At the very least, whether an engineer chooses a management or technical career track they should seek training in management basics (budgeting, accounting, etc.).

If you have selected the management path as your career goal, prepare yourself to succeed before accepting a position. Your Agency or a local college may offer management training programs.

Part 4 - Recommendations for Moving up the Career Ladder

There is no magic formula for success. Other people can help, but do not rely entirely on them. **Take your career into your hands!** During the course of a career, everyone experiences good opportunities and problem situations. The successful person maximizes the good opportunities while minimizing the effects of problems. Here are some suggestions that you may find helpful.

- Be sure your supervisor knows that you are worth more than you are paid, i.e., that the department or program is getting a great deal of value for the dollar from your work;
- Be aware of what is important to your supervisor;
- Be sure your supervisor knows **specifically** what you are doing. You cannot get credit for your work if your supervisor is unaware of it;
- Seek assignments that others have failed to complete. Such assignments may represent opportunities for you to demonstrate your capabilities to the fullest;
- Never blame someone else for an error or problem regardless of who is at fault. Assume that your supervisor is interested in results, not excuses. The person in control is the person who accepts responsibility and then goes on to get the job done. **Be that person;**
- After a problem has been resolved, analyze it and the events that lead up to it. What could you have done to prevent the problem or improve the results;
- Never be afraid to change your style to improve your abilities and thus enhance your effectiveness;
- Be a risk taker. A high risk situation is **not** a chance to fail. It is an opportunity to succeed. Still, do not take the risk without appropriate preparation and guidance;
- Learn from other people's mistakes;
- Carry a mental five-year plan with you at all times. Decide what you want to be doing in five years and start working toward that goal now;
- Pay your dues - get your tickets punched! Do not avoid undesirable, but necessary, assignments. Be sure to get credit for completing them;
- Good communication skills are vital. If you do not already know how to communicate well, verbally and on paper, **learn;**
- Maintain a positive attitude. Show those around you that you care;
- Be excited about your job. If you are not and cannot be, find another position.

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