ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
SOUTHERN REGION

SO 3410.9

12/8/92

SUBJ: AIRWAY FACILITIES ENGINEERING CONVERSION PROGRAM

1. PURPOSE. The purpose of the engineering conversion program is to provide an avenue for technical employees to enter the professional engineering series. This order restates existing policy inclusive of the U. S. Office of Personnel Management (OPM) Federal Personnel Manual and Handbook of Qualification Standards, and advises all interested personnel of the requirements for participation in the engineering conversion program. This program is primarily targeted for electronic and environmental support technicians.

2. DISTRIBUTION. This order is distributed to Airway Facilities Division, section level; Human Resource Management Division, branch level; and all Airway Facilities field offices.

3. BACKGROUND. In September 1976, the Airway Facilities Division announced the establishment of the Engineering Student Trainee Program which would allow interested technicians to gain the necessary education and experience to move into engineering positions. A standard curriculum was developed based on Southern Technical Institute (STI), Marietta, Georgia (now the Southern College of Technology), courses satisfying CSC Announcement Number 424, May 1977, Alternate Method 3, completion of specific academic courses of at least 60 semester (90 quarter) hours.

Since the establishment of this program, OPM has revised the qualification standards for engineers and student trainees. As a result, the program as described in FAA Order SO 3410.5B, Airway Facilities Engineering Student Trainee Program, has been modified to comply with the revised qualification standards. The significant change between the current program and the modified program is the deletion of the GS-899 Engineering Student Trainee phase. The modified program resulted in the issuance of a new FAA Order, SO 3410.9, Airway Facilities Engineering Conversion Program. FAA Order SO 3410.5B will remain in effect until those employees presently in the GS-899 program complete the requirements of the existing program. At that time, FAA Order SO 3410.5B will be cancelled.

4. ACTION. Special announcements will be issued on an as needed basis. Personnel interested in the engineering conversion program for electronic and environmental support technicians should refer to the following appendices for information/guidance concerning the program:

a. Appendix 1. Sample Advertisement.

b. Appendix 2. Sample Training Plan.

c. Appendix 3. Sample Letter of Mutual Understanding.

Distribution: A-X(AF)-4; A-X(HR)-3; A-(FAF)-0

Initiated By: ASO-425

d. Appendix 4. Copy of CSC and OPM Announcements.

e. Appendix 5. Guidelines for Implementing the Engineering Conversion Program.

f. Appendix 6. Special Tours of Duty for Educational Purposes.

g. Appendix 7. Guidelines for Noncompetitive Promotion Within the Program.

h. Appendix 8. Sample Conversion Package.

i. Appendix 9. Funding Procedures for the Engineering Conversion Program.

j. Appendix 10. General Questions and Answers Relating to Program Operation.

k. Appendix 11. Ad Hoc Review Board.

C. R. Pinkerton
Manager, Airway Facilities Division

APPENDIX 1. SAMPLE ADVERTISEMENT USING COURSE LISTINGS FROM THE GEORGIA INSTITUTE OF TECHNOLOGY

1. PURPOSE. This appendix provides a typical special announcement for a GS-856/802-11/12 engineering conversion program position in the Technical Inspection Field Office (TIFO) and is shown in Figure 1, Appendix 1.

2. BACKGROUND. The selection criteria as well as curriculum requirements have been developed to ensure selectivity in terms of demonstrated educational success, training, experience and management potential.

a. As a factor in considering the program, potential applicants are advised that travel to and from classes is at their own expense. Further, classes and travel are not on official duty time although work hours may be adjusted to accommodate the program. The program will pay cost of tuition, books, and special supplies (excluding calculators). Participation in the engineering conversion program as outlined in the various announcements will not preclude selection for the Cooperative Engineering Development Program.

b. All Engineering Conversion Program positions will be advertised through the merit promotion program, and will normally be at the GS-856/802-11/12 level. The target position in the Regional Office, ARTCC and GNAS sectors is GS-855-13 and GS-855-12 in the TIFO. Upon successful completion of the program, the employee will be converted to an engineer position. The length of the programs will depend on the amount of education and experience that each selectee has upon selection. Individual programs may continue up to a maximum of 5 years.

c. Bids will be accepted from employees with technical experience who qualify for the GS-856/802 series. Normally, this will only include employees in the GS-856/802 series. Selectees will be reassigned in grade to the engineering conversion program position description. If the employee is in a higher grade than GS-12, he/she will be changed to a lower grade and be entitled to pay retention in accordance with Order 3550.11.

NOTE: TO BE CONSIDERED FOR THESE POSITIONS, ALL APPLICANTS MUST HAVE COMPLETED ENTRANCE LEVEL REQUIREMENTS, AND IF THE COLLEGE OR UNIVERSITY REQUIRES IT, PREREQUISITES FOR CALCULUS SUCH AS ENTRANCE LEVEL ALGEBRA AND TRIGONOMETRY. YOU MUST PROVE THIS IN YOUR APPLICATION. FURTHERMORE, THESE ENTRANCE LEVEL REQUIREMENTS AND/OR PREREQUISITES MUST BE RECENT ENOUGH SO THAT THE SCHOOL IN WHICH YOU ARE APPLYING FOR ENTRANCE MUST ACCEPT YOU IN THEIR FRESHMAN CURRICULUM WITHOUT ANY MAKE UP PREREQUISITE COURSES. FAILURE TO SATISFY THESE REQUIREMENTS WILL BE CAUSE FOR NONSELECTION INTO THE PROGRAM.

FIGURE 1. SAMPLE ADVERTISEMENT

FEDERAL AVIATION ADMINISTRATION
SOUTHERN REGION
ATLANTA, GEORGIA

SPECIAL ANNOUNCEMENT
ENGINEERING CONVERSION PROGRAM
GS-856/802-11/12
TARGET POSITION: ELECTRONIC/ELECTRICAL ENGINEER
GS-855/850-12

SPECIAL ANNOUNCEMENT
ENGINEERING CONVERSION PROGRAM
MPP NO.
LOCATION: ATLANTA, GEORGIA

The best qualified candidates will be selected regardless of race, age, color, religion, sex, or national origin.

****

FAA EMPLOYEES ONLY

AREA OF CONSIDERATION: SOUTHERN REGION

OPENING DATE:
CLOSING DATE:

****

1. PURPOSE. To establish a list of eligible electronic and environmental technicians who desire to participate in the engineering conversion program and progress to the professional engineering series.

2. BACKGROUND. Since the establishment of this program in September 1976, the Office of Personnel Management has revised the qualification standards for engineers and student trainees. As a result, the program as described in FAA Order SO 3410.5B has been modified to comply with the revised qualification standards. The significant change between the current program as described in Order SO 3410.9 and the modified program is the deletion of the GS-899 Engineering Student Trainee phase. The program still provides an avenue for technical employees to enter the professional engineering series.

3. PROGRAM DESCRIPTION. The FAA Southern Region has established an engineering conversion program. The program provides opportunities for technicians possessing appropriate background to convert to the engineering career series. With the FAA providing the participant appropriate engineering experience and engineering level courses, an employee can qualify for conversion to an engineering series upon successful completion of the program requirements.

The selection criteria as well as curriculum requirements ensure fair and equitable consideration in terms of demonstrated educational success, training and experience.

TECHNICAL INSPECTION FIELD OFFICE (TIFO)

The following training program was developed based on the Engineering Curriculum at the Georgia Institute of Technology, Atlanta, Georgia. The courses were prepared using the 1991-1992 General Catalog. The U. S. Office of Personnel Management, Handbook of Qualification Standards, GS-800, dated June 1991, for professional engineering positions require Specified Academic Courses to meet the educational requirements for the Alternate Method of qualifying. To be acceptable, the curriculum must: (1) Be in a school of engineering with at least one curriculum accredited by the Accreditation Board for Engineering and Technology (ABET) as a professional engineering curriculum; (2) Include differential and integral calculus and courses (more advanced than first-year physics and chemistry) in five of the following seven areas of engineering science or physics: (a) statics, dynamics; (b) strength of materials (stress-strain relationships); (c) fluid mechanics, hydraulics; (d) thermodynamics; (e) electrical fields and circuits; (f) nature and properties of materials (relating particle and aggregate structure to properties); and (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics. In order to meet the specified academic coursework, it requires successful completion of at least 60 semester hours of courses in the physical, mathematical, and engineering sciences and in engineering, which included the courses specified in the basic requirement. The courses must be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in the basic requirements.

I. Physics. (Not required, however, if required as prerequisite for other required courses, they are countable in hours towards the minimum required for completion of the Specified Academic Courses Alternate Method of meeting the basic engineering qualifications.)

Department	Course	Course Title	Credit
Phys	2121	Particle Dynamics	4-3-5
Phys	2122	Electromagnetism	4-3-5
Phys	2123	Optics & Modern Physics	4-3-5

II. Mathematics (Required)

Department	Course	Course Title	Credit
Math	1507	Calculus I	5-0-5
Math	1508	Calculus II	5-0-5
Math	1509	Calculus III	5-0-5
Math	2507	Calculus IV	5-0-5
Math	2508	Calculus V	5-0-5
Math	3308	Differential Equations	5-0-5

III. Required Engineering Science Courses. Program requires five of the following seven areas:

Department	Course	Course Title	Credit
a. Statics, Dynamics			
ESM	2201	Statics	3-0-3
ESM	3201	Dynamics I	3-0-3
b. Thermodynamics			
ME	3720	Thermodynamics	4-0-4
c. Strength of Materials			
ESM	3301	Mechanics of Deformable Bodies	5-0-5
d. Fluid Mechanics - Hydraulics			
CE	3053	Fluid Mechanics I	3-0-3
CE	3054	Fluid Mechanics II	3-0-3
e. Electrical Fields and Circuits			
EE	3200	Elements of Electrical Engineering I	3-0-3
EE	3250	Elements of Electrical Engineering II	3-0-3
EE	3300	Electromagnetics I	3-0-3
EE	3310	Electromagnetics II	3-0-3
EE	3320	Electromagnetics III	3-0-3
EE	4411	Senior Electrical Engineering Laboratory I	0-3-1
f. Nature and Properties of Materials (relating particle and aggregate structure to properties).			
EE	3350	Fundamentals of Semi-conductor Devices	3-0-3

g. Other comparable areas of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics. (Note: Because our program is the Specified Academic Courses Alternate Method for conversion to either an Electrical Engineer or Electronics Engineer, no

technical electives other than those that have an EE prefix will be allowed without written approval of the Ad Hoc Review Board for Conversion.

Department	Course	Course Title	Credit
EE	1300	Computer and Digital Design Fundamentals	3-0-3
EE	3211	Circuits and Systems	3-0-3
EE	3216	Circuits, Signals, and Systems I	3-0-3
EE	3221	Circuits, Signals, and Systems II	3-0-3
EE	3260	Engineering Electronics	3-0-3
EE	3270	Non-linear Devices and Circuits	3-0-3
EE	3330	Electromechanical Systems and Energy Conversion	3-0-3
EE	3360	Digital Hardware	3-0-3
EE	3411	Junior Electrical Engineering Laboratory I	0-3-1

In analyzing the selection of the five of seven areas, unless the student already has some college level courses for prerequisite purposes, it is recommended that the student choose five of the following six areas as listed above in meeting the requirements needed for conversion to the engineering series:

a. Statics-Dynamics

b. Thermodynamics

c. Strength of Materials

e. Electrical Fields and Circuits

f. Nature and Properties of Materials

g. Other comparable areas as announced.

This will allow the student more opportunity to take courses of study in the electronics area. An exception to the above recommendation would be if the student has already met area "d" (Fluid Mechanics and Hydraulics) at another college or university and the Georgia Institute of Technology has accepted them in their degree program.

A minimum of 60 semester/90 quarter hours of courses as specified above are required for the completion of the Alternate Method of meeting the basic engineering qualifications.

NOTE: EE courses marked "not for electrical or computer engineering students," i.e., EE 3702, Elementary Electronics, are not counted towards the 90 quarter hours needed for conversion, nor will FAA pay for such courses.

4. CANDIDATES EVALUATION AND ASSIGNMENT. Bids will be accepted from employees in the GS-802/856-11/12 grade levels and other FAA employees in the WG series who are eligible for the GS-802/856 series. Candidates are encouraged to bid across specialty areas. Ranking factors will be used to establish an applicant's position on the list of eligibles. Applicants who are selected will be in the GS-856/802 series. It is anticipated that the total program for each student will be completed in 3 to a maximum of 5 years depending on the candidate's former education and engineering experience. Personnel selected under this program will be assigned to a position in the Southern Region, Airway Facilities Division, Technical Inspection Field Office, to provide engineering experience. Failure to complete the program will result in reassignment to available positions within the Southern Region for which the technician is qualified (normally the grade and series held upon entrance into this program).

Participants will attend school on alternate school quarters. One quarter the participant will be performing technical inspections requiring travel throughout the region. The next quarter, the participant will work 40 hours a week and attend classes either after work hours or on a special 40-hour work tour to accommodate class schedules. Duties during the school quarter will include tasks associated with the technical inspection program and other engineering assignments. Upon successful completion of the program, participants will be converted and reassigned to an engineering position.

5. HOW TO BID. Applicants interested in the engineering conversion program for Electronic and Environmental Support Technicians must submit the following:

- An up-to-date SF-171, Application for Federal Employment
- FAA Form 3330.42, Request for Promotion Consideration and Acknowledgement
- FAA Form 3330.52, Knowledges, Abilities, Skills, and Other Characteristics (KASO's) Evaluation
- Current Performance Appraisal Document
- A separate sheet describing your experience/training in the KASO's listed in paragraph 5.
- A separate sheet containing a summary of all training completed.
- A college transcript; or OPM Form 1170/17.

It is important that all Academy training be reflected in complete detail by course title, number, and grade. Also, previous college level coursework shall be shown by school, date of course, course number, quarter/semester hours credit, grade obtained, etc. A copy of college transcript(s) is highly desirable. Since engineering is a science based on mathematics, a pattern of failures, withdrawals, incompletes, and grades below "B" in courses which are prerequisites for calculus, such as entrance level algebra and trigonometry

will be the basis for nonselection without successful completion (a grade of "C" or better) of the first calculus course.

NOTE: To be considered for these positions, all applicants must have completed entrance level requirements, and if the college or university requires it, prerequisites for calculus such as entrance level algebra and trigonometry. You must prove this in your application. Furthermore, these entrance level requirements and/or prerequisites must be recent enough so that the school in which you are applying for entrance must accept you in their freshman curriculum without any make up prerequisite courses. Failure to satisfy this requirement will be cause for nonselection to the program.

6. RANKING FACTORS. Ranking of eligible candidates to determine the highly qualified will be accomplished by comparing each candidate's Knowledges, Skills and Abilities with the evaluation factors listed within this advertisement. These factors, which are assigned values and defined by a crediting plan, are essential for satisfactory employee performance. Supervisory appraisals, experience, training and awards will be considered in the ranking process.

For each of the following Knowledges, Abilities, Skills and Other Characteristics (KASO's), describe the following: (1) Work experience - describe the tasks you have performed which demonstrate your knowledge or ability for each KASO. (2) Training and/or Awards - describe the training or awards you have received which contribute or confirm your knowledge or ability for each KASO. (Please attach a copy of any award justification which confirms your knowledge or ability in any of these KASO's). Please include dates and where you received the experience, training or awards. Do not rely on position descriptions to explain your experience. Give What, When, Where and How. Please describe your experience in these KASO's on a separate sheet and attach to your bid. This information will be used in the rating process.

KNOWLEDGES, ABILITIES, SKILLS, AND OTHER CHARACTERISTICS (KASO's)

- Ability to read, comprehend and interpret written material.

- Skill in problem-solving techniques.

- Ability to communicate in writing.

- Ability to establish controls and meet deadlines.

- Ability to communicate orally.

- Ability to work with others.

- Personal Characteristic - Initiative.

7. TRAINING AGREEMENT. Personnel selected for the engineering conversion program will attend an accredited college/university and enroll in an engineering curriculum accredited by the Accreditation Board for Engineering and Technology (ABET). Additionally, courses taken at any college/university must be transferable to the Georgia Institute of Technology, Atlanta, Georgia, since the training program was developed based on Georgia Tech, which satisfies the U.S. Office of Personnel Management's Handbook of Qualification

Standards for the professional engineering series. School will be attended on the employee's own time, but, at government expense. The FAA will pay for tuition and other direct school training costs (does not include calculators). FAA will not pay for mileage to and from training classes. A training agreement and an agreement to accept an engineering position within the Southern Region after completion of the program must be signed. All trainees will work under the direction of an engineer performing technical inspections or other engineering assignments to provide the engineering experience required by the Handbook of Qualification Standards X-118.

NOTE: All bids should be mailed to the Federal Aviation Administration, P.O. Box 20636, Attention: ASO-14B, Atlanta, Georgia 30320.

BID DOCUMENTS WILL BE RETAINED WITH THE MERIT PROMOTION FILE. IF ALL REQUESTED FORMS ARE NOT SUBMITTED, APPLICATION WILL BE RATED INELIGIBLE.

APPENDIX 2. SAMPLE TRAINING PLAN FOR ENGINEERING CONVERSION PROGRAM PARTICIPANTS

1. PURPOSE. This appendix provides a sample training plan developed for the engineering conversion program using the curriculum at the Georgia Institute of Technology (Georgia Tech). The same format is to be used in developing a plan for each location that has a conversion program. All references and courses in the plan to Georgia Tech should be deleted and substitute the name and courses of the college in your area. A similar plan is to be developed for each student prior to their entering school. A copy of the plan is to be provided to ASO-425 for review and concurrence. This plan is shown in Figure 1, Appendix 2.

a. A training plan must be developed for each student entering into the program. The college courses advertised for a sector's location are to be used in developing the plan. This training plan must be submitted to ASO-425 for approval and returned to the appropriate office before any college training expenses are incurred for the student. Training plans may be amended when required; however, no courses other than those shown on the approved training plan are to be taken without ASO-425 approval of the amended training plan.

b. A timetable for the ongoing Conversion Program must also be developed and provided to ASO-425. The format is as shown in Figure 2, Appendix 2.

c. A progress report for each participant in the Conversion Program must be completed at the end of each academic quarter and provided to ASO-425. The format for the progress report is shown in Figure 3, Appendix 2.

2. TRAINING ACTIVITIES. Training activities are to be evaluated to assure compliance with regional and national policies and procedures, and ensure that the training received produced the desired change in the engineering students' skills and knowledge for assignment of more comprehensive duties and responsibilities leading to conversion to engineering series. The training evaluation is conducted on a regular basis not less than quarterly to ensure:

a. Counseling of engineering students prior to the beginning of each training quarter with regard to agency policy, training objectives, desired outcome, relationship of training to the position assigned, etc.

b. Proper application of teaching/learning principles by the engineering student.

c. Accomplishment of training required to satisfy Announcement No. QIS-800, June 1991, the Specified Academic Courses Alternate Method, and engineering work experience as required by X-118, OPM Qualification Standards.

d. Review of internal practices to assure compliance with policies and procedures.

e. End of quarter evaluation by supervisor/engineering student to assure training assignments have contributed to career enhancement and attainment of the FAA's engineering conversion program.

3. ANALYSIS OF THE TRAINING PROGRAM. The program has been designed to meet the Specified Academic Courses as the Alternate Method of qualifying under the basic engineering requirement of the OPM Qualification Standards for Engineers (Announcement No. QIS-800, June 1991). The specific requirements are successful completion in an accredited college or university of at least 60 semester (90 quarter) hours of courses acceptable for credit toward a B.S. in professional engineering in the physical, mathematical, and engineering sciences. The program is a totally integrated program of professional on-the-job training under the direction of a fully qualified engineer and attendance, during other than duty hours, at Georgia Tech or other approved college or university for which credit can be transferred to Georgia Tech. Three separate programs are available and include the NAS Sector Program (GNAS or ARTCC), the Regional Office Program, and the Technical Inspection Field Office (TIFO) Program. In the NAS Sector Program, the participant will be in the Airway Facilities Sector maintenance and inspection program and attend school generally on alternate quarters. In the Regional Office program, the participant will be performing engineering duties requiring travel throughout the Region and attend school generally during alternate quarters. In the TIFO Program, the participant will perform technical inspections and attend school generally during alternate quarters. During the school quarter, the participant will work 40 hours with adjusted work schedule, as necessary, to accommodate class schedules.

4. REQUIRED TRAINING. The following is an outline of basic course requirements for Electronic Technicians to qualify for engineering positions. The courses outlined are based upon requirements outlined by Office of Personnel Management (OPM) Announcement No. QIS-800, June 1991. The Specified Academic Courses Alternate Method is the basis for the qualifications for the program.

OPM Announcement No. QIS-800, the Alternate Method of Specified Academic Courses, outlines completion of 60 semester/90 quarter hours of courses in the physical, mathematical, and engineering sciences and in engineering. The courses must include differential and integral calculus and courses (more advanced than first year physics and chemistry) in five of the seven areas of engineering science or physics: (a) statics, dynamics; (b) thermodynamics; (c) strength of materials; (d) fluid mechanics, hydraulics; (e) electrical fields and circuits; (f) nature and properties of materials; and (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

Engineering course requirements are specified utilizing Georgia Institute of Technology (General Catalog 1991-92) courses that satisfy OPM Announcement No. QIS-800, June 1991.

Course Number/ Subject area	Course Description	Quarter Credit Hour
Required Mathematics:		
Math 1507 Calculus I	Differential calculus. Cartesian and polar coordinates, real and complex numbers, algebraic and trigonometric functions, geometric and physical applications of the derivative.	5
Math 1508 Calculus II	Integral calculus. Definite and indefinite integrals, techniques of integration, geometric and physical applications, approximate methods, improper integrals, separable and low-order linear differential equations.	5
Math 1509 Calculus III	Geometry and vectors in Euclidean spaces, systems of linear equations and matrices. The differential calculus of functions of several variables, curvilinear motion and line integrals.	5
Math 2507 Calculus IV	Lagrange multipliers. The calculus of vector-valued functions of several variables. Multiple integrals. Surface integrals and Theorems of Green, Gauss, and Stoke with applications.	5
Math 2508 Calculus V	Low-dimensional linear algebra and its applications to linear systems. Series approximations and convergence tests.	3
Math 3308 Differential Equations	Analytic and numerical solutions of elementary differential equations. Applications. Matrix treatment of linear systems: eigne value method and exponential matrix. Series methods.	5

Course Number/ Subject area	Course Description	Quarter Credit Hour
	Courses in five of the seven following areas are required:	
a. Statics, Dynamics		
ESM 2201 Statics	Elements of statics in two and three dimensions, centroids, analysis of structures and machines, friction.	3
ESM 3201 Dynamics I	Kinematics and kinetics of rigid bodies in plane motion.	3
b. Thermodynamics		
ME 3720 Thermo-dynamics	Fundamentals of engineering thermodynamics, thermodynamic properties of matter, the concept of conservation of energy, the second law of thermodynamics and application to engineering processes.	4
c. Strength of Materials		
ESM 3301 Mechanics of Deformable Bodies	Definition and analysis of strain and stress, applications to axially loaded elements, torsion of circular shafts and bending of beams, intro-duction to simple plasticity and to column stability.	5
d. Fluid Mechanics - Hydraulics		
CE 3053 Fluid Mechanics I	Elementary mechanics of fluids with emphasis on analysis, fluid kinematics, equations of motion, momentum and energy principles, surface and form resistance.	3
CE 3054 Fluid Mechanics II	Elementary mechanics of fluids with emphasis on engineering applications. enclosed conduit flow, open channel flow, hydraulic machinery, fluid measurements, dynamic similitude.	3
e. Electrical Fields and Circuits		
EE 3200 Elements of Electrical Engineering I	Introduction to basic concepts of circuit elements, elements of circuit models, and techniques for circuit analysis.	3

Course Number/ Subject area	Course Description	Quarter Credit Hour
EE 3250 Elements of Electrical Engineering II	Time-domain analysis, ac circuits, and two-port networks.	3
EE 3300 Electro-magnetics I	A study of Maxwell's equations. Electromagnetic theory of simple media. Electrostatics, magneto-statics, and electromagnetostatics.	3
EE 3310 Electro-magnetics II	An introduction to the theory and applications of plane waves and transmission lines.	3
EE 3320 Electro-magnetics III	Introduction to the concepts and techniques involved in the analysis and design of basic waveguides and antennas.	3
EE 4411 Senior Electrical Engineering Laboratory I	The use, operation, and limitations of standard electromagnetic field measurement and signal generating equipment.	1

f. Nature and Properties of Materials (relating particle and aggregate structure to properties).

EE 3350 Fundamentals of Semi-conductor devices	A study of the electrical properties of semi-conductors with applications to electronic devices. Emphasis is on the relationship between internal physical operation and circuit character-istics.	3

g. Other comparable areas of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics (Note: Because our program is the Specified Academic Courses Alternate Method for conversion to either an Electrical Engineer or Electronic Engineer, no technical electives other than those that have an EE prefix will be allowed without written approval of the Ad Hoc Review Board for Conversion.

EE 1300 Computer and Digital Design Fundamentals	An introduction to the fundamental concepts of digital systems, including digital computers. Emphasis is placed on the structure of digital systems and the basic organization of digital computers.	3

Course Number/ Subject area	Course Description	Quarter Credit Hour
EE 3211 Circuits and Systems	Laplace transform techniques in circuits and systems. Frequency response characteristics. Feedback principles.	3
EE 3216 Circuits, Signals, and Systems I	An introduction to linear time-invariant systems and Fourier analysis.	3
EE 3221 Circuits Signals, and Systems II	An introduction to applications of signal and system theory using communications and signal processing.	3
EE 3260 Engineering Electronics	Development of techniques necessary for the analysis of active linear electronic circuits.	3
EE 3270 Nonlinear devices and Circuits	Presentation of concepts important in the analysis design of systems utilizing linear and nonlinear devices and circuits.	3
EE 3330 Electro-mechanical Systems and Conversion	Fundamentals of electromechanical energy conversion, electromechanical devices and systems. Energy state function, force energy relationships, basic transducers, introduction to A.C. and D.C. machines.	3
EE 3360 Digital Hardware	A study of gates, flip-flops, counters, registers, memory devices, and integrated circuits. Consideration of the architecture of computers and digital systems.	3
EE 3411 Junior Engineering Laboratory I	Exercises in combinational and sequential design and hardware implementation utilizing TTL gates, flip-flops. Electrical multiplexers, and counters.	1

FIGURE 1. SAMPLE TRAINING PLAN

BASIC ENGINEERING REQUIREMENTS

(Specified Academic Courses Alternate Method of Qualifying)

Name_____

The following provides guidance to engineering conversion participants using the program established at the Georgia Institute of Technology. The data was prepared using the 1991-1992 General Catalog.

The courses listed are required on or counted in the 60 semester (90 quarter) hours in accordance with the Specified Academic Courses Alternate Method.

Subject	Credit Hours	Completion Date and Grade
Physics (Not required but may be prerequisite for other required courses and are countable in hours.)		
PHYS 2121 - Particle dynamics	5	
PHYS 2122 - Electro Magnetism	5	
PHYS 2123 - Optics and Modern Physics	5	
Math - Required		
MATH 1507 - Calculus I	5	
MATH 1508 - Calculus II	5	
MATH 1509 - Calculus III	5	
MATH 2507 - Calculus IV	5	
MATH 2508 - Calculus V	5	
MATH 3308 - Differential Equations	5	
Required (Must satisfy five of seven areas listed)		
a. Statics and Dynamics		
ESM 2201 - Statics	3	
ESM 3201 - Dynamics I	3	
b. Thermodynamics		
ME 3720 - Thermodynamics	3	
c. Strength of Materials		
ESM 3301 - Mechanics of Deformable Bodies	3	

FIGURE 1. SAMPLE TRAINING PLAN (cont'd)

Subject	Credit Hours	Completion Date and Grade
d. Fluid Mechanics - Hydraulics		
CE 3053 - Fluid Mechanics I	3	_____
CE 3054 - Fluid Mechanics II	3	_____
e. Electrical Fields and Circuits		
EE 3200 - Elements of Electrical Engineering I	3	_____
EE 3250 - Elements of Electrical Engineering II	3	_____
EE 3300 - Electromagnetics I	3	_____
EE 3310 - Electromagnetics II	3	_____
EE 3320 - Electromagnetics III	3	_____
EE 4411 - Senior Electrical Engineering Laboratory I	1	_____
f. Nature and Properties of Materials (relating particle and aggregate structure to properties)		
EE 3350 - Fundamentals of Semiconductor Devices	3	_____
g. Other comparable areas of fundamental engineering science or physics, such as optics, heat transfer, soil mechanic, or electronics. (Note: Because our program is the Specified Academic Courses Alternate Method for conversion to either an Electrical Engineer or Electronic Engineer, no technical electives other than those that have an EE prefix will be allowed without written approval of the Ad Hoc Review Board for Conversion.		
EE 1300 - Computer and Digital Design Fundamentals	3	_____
EE 3211 - Circuits and Systems	3	_____
EE 3216 - Circuits, signals, and Systems I	3	_____

FIGURE 1. SAMPLE TRAINING PLAN (cont'd)

Subject	Credit Hours	Completion Date and Grade
EE 3221 - Circuits, signals, and Systems II	3	_____
EE 3260 - Engineering Electronics	3	_____
EE 3270 - Nonlinear Devices and Circuits	3	_____
EE 3330 - Electromechanical Systems and Energy Conversion	3	_____
EE 3360 - Digital Hardware	3	_____
EE 3411 - Junior Electrical Engineering Laboratory I	1	_____

FIGURE 2. TIMETABLE
ENGINEERING CONVERSION PROGRAM

Name________________________________ Date_________

Educational credit hours satisfying OPM Announcement No. QIS-800, June 1991, Specified Academic Courses Alternate Method, upon entrance in program_________
____

date of entrance in program________________________

Winter Quarter	Spring Quarter	Summer Quarter	Fall Quarter
Jan - Mar 19__	Apr - Jun 19__	Jun - Sep 19__	Sep - Dec 19__
Winter Quarter	Spring Quarter	Summer Quarter	Fall Quarter
Jan - Mar 19__	Mar - Jun 19__	Jun - Sep 19__	Sep - Dec 19__
Winter Quarter	Spring Quarter	Summer Quarter	Fall Quarter
Jan - Mar 19__	Mar - Jun 19__	Jun - Sep 19__	Sep - Dec 19__
Winter Quarter	Spring Quarter	Summer Quarter	Fall Quarter
Jan - Mar 19__	Mar - Jun 19__	Jun - Sep 19__	Sep - Dec 19__
Winter Quarter	Spring Quarter	Summer Quarter	Fall Quarter
Jan - Mar 19__	Mar - Jun 19__	Jun - Sep 19__	Sep - Dec 19__

5. TRAINING EVALUATION. Following completion of the training program previously outlined, the participant will prepare a Standard Form 171, Personal Qualifications Statement, outlining all engineering and educational training, for submission to ASO-425, ATTN: Ad Hoc Review Board. Reference Appendix 8 of this Order. Transcripts outlining educational training should accompany the Standard Form 171. An evaluation team will be convened under the direction of ASO-425, Training and Support Section, to review each request for conversion to engineering status. Upon satisfactory approval of the board, the engineer will be reassigned to an available engineering position within the Southern Region.

FIGURE 3. ENGINEERING STUDENT PROGRESS EVALUATION

NAME:_____ DATE REVIEWED:_____

REPORT PERIOD:_____

PREPARED/DISCUSSED BETWEEN

Employee's Name:_____

Supervisor's Name:_____

1. Engineering Work Assignments Accomplished This Report Period

a. Engineering work assignment as related to experience required by X-118 OPM Qualification Standards:

(1) Technical Inspections:_____

_____

_____

_____

(2) Additional Work Assignments:_____

_____

_____

_____

2. Training Accomplished This Report Period

a. Education requirement to satisfy OPM Announcement No. QIS-800, June 1991, the Specified Academic Courses Alternate Method:_____

_____

_____

_____

b. FAA agency or out of agency training:

FIGURE 3. ENGINEERING STUDENT PROGRESS EVALUATION (cont'd)

3. Engineering Work Assignments and Training Planned for the Next Report Period:

a. Work Assignments:_____

_____

_____

_____

b. Training:_____

_____

_____

_____

REMARKS:

APPENDIX 3. LETTER OF MUTUAL UNDERSTANDING.

1. PURPOSE. This appendix provides a copy of the Letter of Mutual Understanding that must be signed by the employee and the FAA. It is the policy of FAA to obtain and replenish the best possible staff of qualified engineers. This is being accomplished in several ways, one of which is the engineering conversion program. In this program, the employee and the agency enter into an agreement which provides mutual benefits and protection for the financial and time investment of both. A copy of this agreement is shown in Figure 1, Appendix 3.

a. The program requires attendance in school at least two quarters or semesters each calendar year. This will meet the requirements for progression in the academic portion of the program while allowing the manager to utilize the employee during approximately half the year for engineering projects/ technical evaluations away from headquarters. The manager, at his option, may allow the engineering student to attend classes more frequently than the minimum specified based on local needs.

b. Each participant normally is expected to take a minimum of two courses, each being three or four semester hours, or four or five quarter hours long, each time he/she attends school, and more hours if possible, depending on individual background and courses offered by the school. The program is expected to be completed in no more than five (5) years.

c. This program was established as a long range training program to meet the career enhancement goals of the employees and the engineering needs of the agency. The employees are committing a significant amount of time and effort in pursuit of meeting the requirements of conversion to engineering status. The agency is committing a significant amount of funds in support of the training. Because of these facts and the policy set forth in Paragraph 3 of the Letter of Mutual Understanding, signed by the employee and the Division Manager upon entering into the engineering conversion program, participants will not be considered for any ingrade/downgrade reassignment other than a hardship or failure in the program.

FIGURE 1. LETTER OF MUTUAL UNDERSTANDING.

A LETTER OF MUTUAL UNDERSTANDING FOR FAA PARTICIPANTS IN THE ENGINEERING CONVERSION PROGRAM

INTRODUCTION. It is the Airway Facilities Division's desire and goal to obtain the best possible staff of qualified engineers. Toward this goal, many technicians have acquired experience with agency mission, policies, and programs; and except for specific knowledge of professional engineering, these technicians are excellent candidates for engineering positions within the agency. It is the purpose of this program to foster and develop these resources. This program is planned to culminate in achieving this goal. Due to the anticipated length of this training program, the year-to-year continuation is dependent on availability of funds in the annual appropriation; however, the Southern Region will make every effort to assure its continuation.

1. The FAA agrees to pay costs of tuition, books, fees, and other miscellaneous supplies for all courses required to complete the program curriculum as established for the individual. (Does not include calculators.)

2. The program goal is to qualify and prepare the participant to perform engineering duties as demonstrated by his/her ability to meet one of the basic educational engineering requirements specified in OPM Announcement Number QIS-800 dated June 1991, and to provide engineering work experience as required by X-118 Qualification Standards.

3. For the duration of the program, the student entering at the GS-12 grade must remain at that grade level to properly accrue the necessary engineering work time for conversion to the engineering series. Selectees who enter at the GS-802/856-11 level may be promoted once it is determined that he/she is performing at the higher grade level and recommended by the supervisor. Length of the program will vary for individual students depending on their individual scholastic credits. Each participant's program will be concluded when the program goal, identified in Item 2 of this document, has been achieved. Withdrawal from the program by the participant for reasons other than personal hardship may result in participant's reassignment at no cost to the agency. Determination will be made by the agency on whether reasons for withdrawal fit the "personal hardship" criteria.

4. Satisfactory performance toward the above program goal is required. A failing final grade, withdrawal from a course after drop/add day thereby incurring training expense, or a final course grade below "C" in any program course, or a grade point average below "C," shall be cause for removal of the participant from the program and from the associated position assignment unless waived by the Airway Facilities Division Manager. Retention privileges and restoration rights to a position equal to that held prior to entering the program will be in accordance with agency need and OPM approved procedures at

FIGURE 1. LETTER OF MUTUAL UNDERSTANDING (cont'd)

the time the action becomes necessary. The participant agrees to accept a position anywhere in the Southern Region.

5. Satisfactory progression in the performance of engineering duties as assigned is also required. An unsatisfactory performance rating by the student's supervisor in these training duties is also a basis for removal from the program.

6. The student must attend classes at least every other quarter/semester. Classroom attendance will be done on nonduty time while performing 40 hours of work each week.

7. State residency (applicable to out-of-state participants). All participants transferring from out of state shall take the necessary action to establish state residency with the school by the beginning of the second year. This can be accomplished by submitting a petition for residency to the registrar of the school and providing ASO-17 with a copy of the school's response. Failure to do so may result in the student paying the difference between resident and nonresident tuition and fees beginning with the second year.

8. All formal reports of progress (i.e., grade reports, student work evaluation, records, forms, certificates, etc.) must be submitted to the student's supervisor not more than 15 days after receipt.

9. The location of the assignment will become the participant's regular duty station for the duration of the program. Transfer of families and household goods will be made at Government expense. Per diem and other travel expenses will be subject to the provisions of the current version of the Travel Handbook DOT 1500.6.

10. The participant agrees to accept the position assigned to him/her at the conclusion of the program so long as:

a. It is at least the same grade as that which he/she held at the start of the program and providing qualification requirements of Paragraph 2 are met.

b. It is classified as requiring the engineering description for which he/she has been prepared by the program.

c. The position is located within the Southern Region of FAA.

_____ _____

(Type in Division Manager's Name) Date
Manager, Airway Facilities Division

_____ _____

Engineering Student Trainee Date

APPENDIX 4. COPY OF CSC AND OPM ANNOUNCEMENTS

1. PURPOSE. This appendix provides a copy of CSC Announcement Number 424, May 1977; OPM Announcement QI-0800, November 1986; and OPM Announcement QIS-800, June 1991.

2. BACKGROUND. The initial Engineering Student Trainee Program used CSC Announcement Number 424, dated May 1977. Since then, OPM has reissued these guidelines as OPM announcement QI 0800, November 1986, and QIS-800, June 1991. The CSC announcement is shown in Figure 1, Appendix 4; the OPM Announcement QI-0800 is shown in Figure 2, Appendix 4; and the OPM Announcement QIS-800 is shown in Figure 3, Appendix 4.

a. To utilize the Specified Academic Courses Alternate Method, the school selected for obtaining the training must have at least one curriculum accredited as a professional engineering curriculum by the Accreditation Board of Engineering and Technology (previously the Engineers' Council for Professional Development).

b. Initially, the general NAS sectors were set up in three target areas; (1) Radar/Automation specialty, GS-0855-12; (2) NAVAID/Communications specialty, GS-0855-12; and (3) Environmental Support specialty, GS-0850-12. Since implementation of this program, variations of the above have been developed and advertised. The highest journeyman level in FAA is at the GS-13 level. There are no provisions for a conversion participant at the GS-13 level because the participant is a trainee, and a trainee cannot provide the system level of expertise that is expected of a GS-13 engineer.

c. Qualifications standards for engineering positions at GS-11 and higher require a minimum of three years of professional experience plus four years of college level education. The education requirement may be met by successful completion of 60 semester/90 quarter hours of courses in the physical, mathematical and engineering sciences.

d. This order was developed specifically for the OPM Specified Academic Courses Alternate Method for qualifying for conversion to the professional series; however, the OPM announcements make provision for other ways for an individual to convert to a professional series, i.e., the Related Curriculum Alternate Method has provisions for individuals with a related degree. Anyone desiring to apply for conversion under Alternate Method of Qualifying Related Curriculum should contact ASO-14 for specific instructions.

e. The Related Curriculum Alternate Method is for those employees who have successfully completed a curriculum leading to a bachelor's degree in engineering technology or in an appropriate professional field, e.g., physics, chemistry, architecture, computer science, mathematics, hydrology, or geology may be accepted in lieu of a degree in engineering, provided the applicant has at least two years of professional engineering supervision and guidance. This

experience will be acquired through an intensive training plan developed between the supervisory engineer and personnel specialist. The third year of intensive training must consist of tasks comparable to the next lower level of the target position (e.g., if the target position is an Electronic Engineer, GS-12, the tasks during the last year of training should be comparable to those of an engineer at the GS-11 level).

FIGURE 1. COPY OF CSC ANNOUNCEMENT NUMBER 424

U.S. Civil Service Commission

Engineering, Physical & Mathematical Sciences & Related Professions

Opportunities in the Federal Government

Announcement No. 424
May 1977

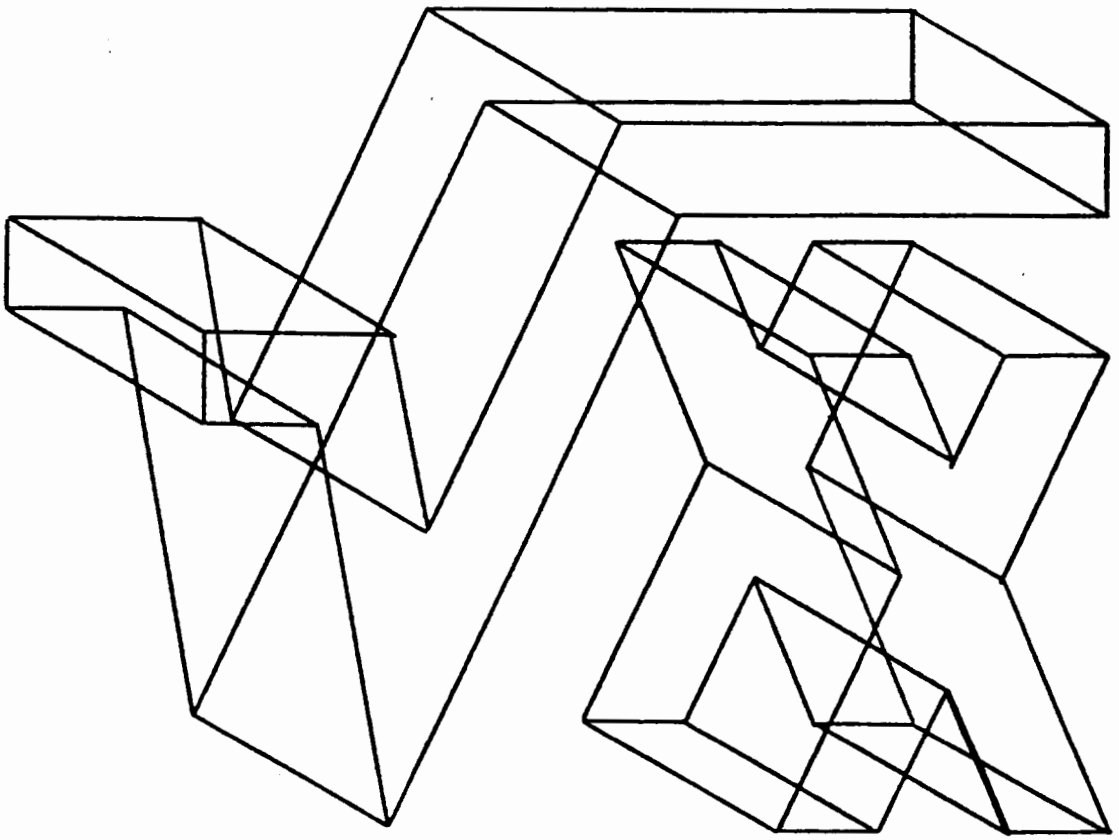

FIGURE 1. COPY OF CSC ANNOUNCEMENT NUMBER 424 (cont'd)

occupations covered

ENGINEERING

Aerospace Engineer
Agricultural Engineer
Architectural Engineer
Biomedical Engineer
Ceramic Engineer
Chemical Engineer
Civil Engineer
Electrical Engineer
Electronic Engineer
Fire Prevention Engineer
General Engineer
Geological Engineer
Geophysical Engineer
Industrial Engineer
Materials Engineer
Mechanical Engineer
Mining Engineer
Nuclear Engineer
Ocean Engineer
Petroleum Engineer
Safety Engineer
Sanitary Engineer
Welding Engineer

PHYSICAL SCIENCES

Astronomer
Cartographer
Chemist
Cryptographer
Food Technologist
Forest Product Technologist
General Physical Scientist
Geodesist
Geologist
Geophysicist
Health Physicist
Hydrologist
Land Surveyor
Metallurgist
Meteorologist
Oceanographer
Photographic Technologist
Physicist
Textile Technologist

ARCHITECTURE

Architect*
Landscape Architect*
Naval Architect

MATHEMATICS

Actuary
Mathematician
Mathematical Statistician
Operations Research Analyst
Statistician

RELATED OCCUPATIONS

Patent Advisor
Patent Examiner

* Applicants for Architect and Landscape Architect positions please see footnote on page 12.

FIGURE 1. COPY OF CSC ANNOUNCEMENT NUMBER 424 (cont'd)

general information

This announcement covers both entry level and advanced positions in engineering, the physical sciences, mathematics and patent examining. It will be used to fill jobs in grades GS-5 through GS-15 throughout the United States and a small number of positions in foreign countries.

Most positions at the higher grade levels (GS-13 through GS-15) are filled by employees within the career service who have demonstrated their advancement potential. Opportunities for appointment from outside the Government at these levels are therefore limited.

Students

If you are a senior or a graduate student, you may file prior to completing all the scholastic requirements if you expect to complete such requirements within 9 months of the date you file. You should submit a list of titles and credit hours of courses which you expect to complete within this period. You may be offered an appointment but may not enter on duty until successful completion of all the required study.

Basis of Rating

NO WRITTEN TEST IS REQUIRED. Referrals to specific vacancies will be based on an evaluation of your experience, education, and training as shown in your application, plus any corroborative or supplementary information which may be obtained.

In the application forms you are asked to indicate your grade level availability and disciplinary fields and/or specializations in which you have had substantial experience or education. You will be considered for the grades and occupational areas for which you indicate potential eligibility and availability.

If qualified for grades GS-5 or 7, you will be assigned a numerical rating and your name will be referred to hiring agencies in the order of your standing on a list of eligibles.

For grades GS-9 and above, your application will be reviewed as vacancies occur for which you indicate availability. Your qualifications will then be evaluated against the specific requirements of that position and you will be ranked and referred for consideration if you are among the best qualified.

Length of Eligibility

You will receive consideration for appointment for a period of 1 year unless removed from consideration due to acceptance of a position, failure to reply to official correspondence or for other reasons. For continued consideration you must submit up-to-date information about your qualifications at intervals of not less than 10 months nor more than 12 months from the date of your notification.

Jobs with State and Local Governments

State and local governments may use the referral list as a supplementary source for recruiting qualified candidates. However, applicants whose primary interest is in State or local government employment should apply directly to the jurisdiction in which they are interested.

Equal Employment Opportunity

Qualified applicants will be considered for appointment without regard to race, religion, color, sex, age, national origin or any other nonmerit factor.

Salaries

Salary rates are adjusted on occasion for many occupations covered and are therefore not listed here. Special salary rates are sometimes authorized for shortage areas. For current salary information, see CSC Salary Supplement AN 2500 at any Federal Job Information Center. (An FJIC should be listed in your telephone directory under "U.S. Government.")

Additional Information

For information about citizenship, age, physical requirements, types of appointments, veterans preference, and other general information, see the Civil Service Commission Pamphlet BRE-37, *Working for the U.S.A.*, which you can obtain from any Federal Job Information Center.

FIGURE 1. COPY OF CSC ANNOUNCEMENT NUMBER 424 (cont'd)

requirements

The following basic education and experience requirements qualify for enterance level positions at the GS-5 level

Basic Engineering Requirements

The primary method of qualifying for professional engineer positions is through successful completion of a full 4-year professional engineering curriculum (*not engineering technology*) leading to a bachelor's or higher degree in engineering in an accredited college or university. To be acceptable, the curriculum must:

1. Be in a school of engineering with at least one curriculum accredited by the Engineers' Council for Professional Development (ECPD) as a professional engineering curriculum, or

2. Include differential and integral calculus and courses (more advanced than first-year science or engineering) in *five* of the *seven* areas of engineering science or physics: (a) statics, dynamics; (b) strength of materials (stress-strain relationships); (c) fluid mechanics, hydraulics; (d) thermodynamics; (e) electrical fields and circuits; (f) nature and properties of materials (relating particle and aggregate structure to properties); (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

Alternate Methods of Qualifying

If you do not meet the basic engineering requirements above, you may qualify for entry-level positions through four years of experience or a combination of education and experience.

Candidates may substitute for the basic requirement of at least 4 years of college-level education, training and/or technical experience that furnished (1) a thorough knowledge of the physical and mathematical sciences underlying professional engineering, and (2) a good understanding, both theoretical and practical, of the engineering sciences and techniques and their application to one of the branches of engineering. This knowledge and understanding must be equivalent to that provided by a full 4-year professional engineering curriculum with respect to (a) the knowledges, skills, and abilities required to perform professional engineering work in the speciality field of the position to be filled, and (b) the ability to develop and progress in a career as a professional engineer in the specialty field. The adequacy of such background *must* be demonstrated by one of the following:

1. Professional Registration:
   Current registration as a professional engineer by any State, Guam, Puerto Rico, the District of Columbia, or the Canal Zone. Such registration must have been achieved by a passing score on the written test administered by the registration board. Those who have achieved registration without passing the written test must have demonstrated eminence in the specialty field. For purposes of this standard, eminence would require a record of accomplishment, professional competence, and recognition in the profession for planning, organization, direction, and coordination of engineering projects of major scope and complexity, or in the well-established service of the candidate as an expert consultant. The nature and necessary quality of this record of engineering leadership should be such as would normally qualify the candidate for the GS-15 grade level in the Federal service, or

2. Written Test:
   Evidence of having successfully passed the Engineer-in-Training (EIT) examination, or the written test required for professional registration, which is administered by the Boards of Engineering Examiners in the various States, District of Columbia, Puerto Rico, Guam, and the Canal Zone, or

   Candidates who have completed all the requirements for a bachelor's degree in engineering technology (BET) including 60 semester hours of courses in the physical,

FIGURE 1. COPY OF CSC ANNOUNCEMENT NUMBER 424 (cont'd)

mathematical and engineering sciences and in engineering as listed in the basic requirements, in an accredited college or in a program accredited by the Engineers' Council for Professional Development (ECPD), *and who pass the EIT examination*, may be eligible for certain engineering positions at GS-5. Eligibility is limited to positions that are within or closely related to the specialty field of the engineering technology program. Positions covered by the minimum educational requirement, which involve highly technical research, development, or similar functions requiring an advanced level of competence in basic science are excluded.

Because of the diversity in kind and quality of BET programs, graduates of other BET programs are required to complete at least one year of additional education or highly technical work experience of such nature as to provide reasonable assurance of the possession of the knowledges, skills, and abilities required for professional engineering competence. The adequacy of this background *must* be demonstrated by passing the EIT examination. Candidates with less education would require correspondingly more highly technical experience of appropriate level and quality so as to provide equivalent knowledge, or

3. Specified Academic Courses:
Successful completion in an accredited college or university of at least 60 semester hours of courses acceptable for credit toward a B.S. in professional engineering, in the physical, mathematical, and engineering sciences. These must have included the courses specified in the basic requirement above. The courses must also be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in the basic requirements.

4. Related Curriculum:
Successful completion in an accredited college of a full 4-year or longer related curriculum leading to a bachelor's or higher degree in engineering technology or in an appropriate professional field, for example physics or architecture, may be accepted in lieu of a degree in engineering *provided you have had at least 1 year of professional engineering experience which was acquired under professional engineering supervision and guidance.*

BASIC REQUIREMENTS FOR ALL OTHER FIELDS

1. Completion of a full 4-year or longer professional curriculum in an accredited college or university leading to a bachelor's degree with specific study in an appropriate field; or

2. a. Completion of courses in an accredited college or university, consisting of lectures, recitations, and appropriate practical laboratory work in the specific field for which you are applying, *plus* appropriate experience or education which when combined with the coursework totals 4 years of education and experience. This combination must have provided technical and professional knowledge comparable to that acquired through successful completion of a 4-year college course as described in "1." above.
b. For some positions, 4 years of appropriate experience, usually with proof of licensing, registration or certification, is qualifying.

FIGURE 2. COPY OF OPM ANNOUNCEMENT QI-0800

Professional Engineering Positions GS-5/15

Qualifications Information Statement

This Statement contains the qualification requirements for Federal positions at grades GS-5 through GS-15 requiring professional engineering skills. The List of Disciplinary Fields and Occupational Specialties at the end of this Statement shows all of the disciplines and specialties covered, and is used to record your academic major(s) and occupational choices on the application Form B.

Specific, current information on how to apply, employment opportunities by occupation and geographic location, and current salary levels is provided in the *Competition Notice for Professional Engineering Positions* (CN-0800). *In many cases, positions in the professional engineering occupations may be filled by direct application to Federal agencies. Consult the* Competition Notice *or the Federal Job Information/Testing Office (FJI/TO) in the area where you wish to work to learn more about these opportunities.*

You may obtain the *Competition Notice* and application forms from any FJI/TO. These are located in many cities across the country, and are listed under "U.S. Government" in the blue pages of major metropolitan area telephone directories. You may also get the address of the nearest FJI/TO by contacting your local State Job Service (or State Employment Security) Office.

Basic Qualifications Requirements

The primary method of qualifying for professional engineer positions is through successful completion of a full 4-year professional engineering curriculum *(not engineering technology)* leading to a bachelor's or higher degree in engineering in an accredited college or university. To be acceptable, the curriculum must:

- Be in a school of engineering with at least one curriculum accredited by the Accreditation Board for Engineering and Technology (ABET) as a professional engineering curriculum (if you qualify this way, you do not need to list your courses on your OPM Form 1170/17), *or*
- Include differential and integral calculus and courses (more advanced than first-year science or engineering) in *five* of the *seven* areas of engineering science or physics: (a) statics, dynamics; (b) strength of materials (stress-strain relationships); (c) fluid mechanics, hydraulics; (d) thermodynamics; (e) electrical fields and circuits; (f) nature and properties of materials (relating particle and aggregate structure to properties); (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

Alternate Methods of Qualifying

If you do not meet the basic engineering requirements above, you may qualify for entry-level positions if you have four years of experience or an equivalent combination of education and experience that meets the requirements listed on the next page.

Candidates may substitute for the basic requirement of at least 4 years of college-level education, training and/or technical experience that furnished (1) a thorough knowledge of the physical and mathematical sciences underlying professional engineering, and (2) a good understanding, both theoretical and practical, of the engineering sciences and techniques and their application to one of the branches of engineering. This knowledge and understanding must be equivalent to that provided by a full 4-year professional engineering curriculum with respect to (a) the knowledges, skills, and abilities required to perform professional engineering work in the specialty field of the position to be filled, and (b) the ability to develop and progress in a career as a professional engineer in the specialty field. The adequacy of such background *must* be demonstrated by one of the following:

- Professional Registration:
  Current registration as a professional engineer by any State, Guam, Puerto Rico or District

United States
Office of
Personnel
Management

QI-0800
November 1985

FIGURE 2. COPY OF OPM ANNOUNCEMENT QI-0800 (cont'd)

of Columbia. Absent other means of qualifying for engineering positions, those candidates who achieved such registration by means other than written test (for example, State grandfather or eminence provisions) are eligible only for positions that are within or closely related to the specialty field of their registration. For example, a candidate who attains registration through a State Board's eminence provision as a manufacturing engineer typically would be eligible only for manufacturing engineering positions; *or*

- Written Test:
  Evidence of having successfully passed the Engineer-in-Training (EIT) examination, or the written test required for professional registration, which is administered by the Boards of Engineering Examiners in the various States, District of Columbia, Puerto Rico and Guam.

  Candidates who have completed all the requirements for a bachelor's degree in engineering technology (BET) including 60 semester hours of courses in the physical, mathematical and engineering sciences and in engineering as listed in the basic requirements, in an accredited college or in a program accredited by the Accreditation Board for Engineering and Technology (ABET), *and who pass the EIT examination*, may be eligible for certain engineering positions at GS-5. Eligibility is limited to positions that are within or closely related to the specialty field of the engineering technology program. Positions covered by the minimum educational requirement, which involve highly technical research, development, or similar functions requiring an advanced level of competence in basic science are excluded.

  Because of the diversity in kind and quality of BET programs, graduates of other BET programs are required to complete at least one year of additional education or highly technical work experience of such nature as to provide reasonable assurance of the possession of the knowledges, skills, and abilities required for professional engineering competence. The adequacy of this background *must* be demonstrated by passing the EIT examination; *or*

- Specified Academic Courses:
  Successful completion in an accredited college or university of at least 60 semester hours of courses acceptable for credit toward a B.S. in professional engineering, in the physical, mathematical, and engineering sciences. These must have included the courses specified in the basic requirement above. The courses must also be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in the basic requirements; *or*

- Related Curriculum:
  Successful completion in an accredited college of a full 4-year or longer related curriculum leading to a bachelor's or higher degree in engineering technology or in an appropriate professional field, for example, physics, chemistry, architecture, computer science, mathematics, hydrology, or geology, may be accepted in lieu of a degree in engineering *provided you have at least 1 year of professional engineering experience which was acquired under professional engineering supervision and guidance.*

Qualification Requirements by Grade Level

GS-5
The basic requirements are fully qualifying for GS-5 positions.

GS-7
The basic requirements plus:

- One year of professional experience in an appropriate field comparable in difficuly and responsibility to GS-5 level work in the Federal service (if you have a professional engineering degree, up to 12 months of appropriate experience gained as a technician or technologist equivalent to the GS-5 level or higher, may be credited in qualifying for GS-7 engineer); *or*
- One full academic year, or completion of the equivalent 30 semester hours, of graduate education in an appropriate field; *or*
- Successful completion of a 5-year program of study (i.e., one designed to be completed in no less than 5 years) of at least 160 semester hours leading to a bachelor's degree in engineering in an accredited college or university; *or*
- One year of appropriate student trainee experience or work experience in a cooperative work-study educational curriculum; *or*

FIGURE 2. COPY OF OPM ANNOUNCEMENT QI-0800 (cont'd)

- Completion of all requirements for a bachelor's degree (not a B.S. in engineering technology) which meets one of the following Superior Academic Achievement standards:
  1. A standing in the upper third of your class or major subdivision (e.g., school of engineering) at the time you apply; *or*
  2. A grade average of "B" (2.90 of a possible 4.0) or its equivalent for all courses completed: (a) at the time of application; or (b) during the last 2 years of your undergraduate curriculum; *or*
  3. A "B+" (3.5 of a 4.0) average or its equivalent for all courses completed in a qualifying major field of study, either: (a) at the time of application; or (b) during the last 2 years of your undergraduate curriculum; *or*
  4. Election to membership in one of the national honorary societies (other than freshman societies) that meet the requirements of the Association of College Honor Societies.

If you apply based on Superior Academic Achievement, you must indicate the basis for this achievement in the proper section of OPM 1170/17.

If more than 10 percent of your courses were taken on a pass/fail basis, your claim must be based on class standing or membership in an honorary society.

Note: If you are a senior, you may be rated provisionally eligible under *2* or *3*, above, if you had the required average in your junior year. You will be required to submit evidence at the time of appointment that you maintained the required average in your senior year.

GS-9

The basic requirements plus:

- Two years of professional experience in an appropriate field including at least 1 year comparable in difficulty and responsibility to GS-7 level work in the Federal service; *or*
- Completion of all requirements for a master's or equivalent degree in an appropriate field; *or*
- Two full academic years, or completion of the equivalent of 60 semester hours of graduate education in an appropriate field; *or*
- A combination of Superior Academic Achievement (as required for GS-7 above) plus 1 year of appropriate professional experience comparable to the GS-7 level.

GS-11

The basic requirements plus:

- Three years of professional experience in an appropriate field including at least 1 year comparable in difficulty and responsibility to GS-9 level work in the Federal service; *or*
- Completion of all requirements for a doctoral degree (Ph.D. or equivalent) in an appropriate field; *or*
- Three full academic years, or completion of the equivalent of 90 semester hours of graduate education in an appropriate field; *or*
- For some Research Positions only: completion of all requirements for a master's or equivalent degree for which at least 2 full academic years of graduate study is required.

GS-12/15

The basic requirements plus:

- Three years of professional experience in an appropriate field including at least 1 year comparable in difficulty and responsibility to that of the next lower grade in the Federal service; *or*
- For some GS-12 Research Positions only: completion of all requirements for a doctoral degree (Ph.D. or equivalent).

General Provisions

The provisions listed below apply in crediting eduction or experience for any grade:

- For all grades, qualifying experience may be either paid or volunteer experience.
- Time spent in *military service* may be credited as an extension of experience gained immediately prior to entering the service or it may be credited on its own merits, whichever is more favorable.
- In order to qualify for most positions in *research, development, evaluation* or *similar creative activities*, completion of a full 4-year curriculum in an accredited college leading to a Bachelor's degree in an appropriate field will normally be required.
- Positive evidence of *highly creative* or *outstanding research*, e.g., development of a basic principle, concept, method, approach or technique which opened the way for major advances in the field, may result in eligibility at one grade higher than that for which you would normally be rated. This principle does not apply if your eligibility is based on graduate study.

FIGURE 3. COPY OF OPM ANNOUNCEMENT QIS 800

United States
Office of Personnel Management
Huntsville Area Office

PROFESSIONAL ENGINEERING POSITIONS GS-9/15

Qualifications Information Statement

This pamphlet contains the qualifications requirements and application procedures for Federal positions at grades GS-9 through GS-15 requiring professional engineering skills.

Basic Qualification Requirements: The primary method of qualifying for professional engineering positions is through successful completion of a full 4-year professional engineering curriculum (not engineering technology) leading to a bachelor's or higher degree in engineering in an accredited college or university. To be acceptable, the curriculum must:

- Be in a school of engineering with at least one curriculum accredited by the Accreditation Board for Engineering and Technology (ABET) as a professional engineering curriculum, or

- Include differential and integral calculus and courses (more advanced than first-year science or engineering) in five of the seven areas of engineering science or physics: (a) statics, dynamics; (b) strength of materials (stress-strain relationships); (c) fluid mechanics, hydraulics; (d) thermodynamics; (e) electrical fields and circuits; (f) nature and properties of materials (relating particle and aggregate structure to properties); (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

Alternate Methods of Qualifying: If you do not meet the basic engineering requirements above, you may qualify for entry-level positions if you have four years of experience or an equivalent combination of education and experience that meets the requirements listed below.

Candidates may substitute for the basic requirement of at least 4 years of college-level education, training and/or technical experience that furnished (1) a thorough knowledge of the physical and mathematical sciences underlying professional engineering, and (2) a good understanding, both theoretical and practical, of the engineering sciences and techniques and their application to one of the branches of engineering. This knowledge and understanding must be equivalent to that provided by a full 4-year professional engineering curriculum with respect to (a) the knowledge, skills, and abilities required to perform professional engineering work in the specialty field of the position to be filled, and (b) the ability to develop and progress in a career as a professional engineer in the specialty field. The adequacy of such background must be demonstrated by one of the following:

June 1991
QIS-800

FIGURE 3. COPY OF OPM ANNOUNCEMENT QIS 800 (cont'd)

- **Professional Registration:** Current registration as a professional engineer by any State, Guam, Puerto Rico or the District of Columbia. Absent other means of qualifying for engineering positions, those candidates who achieved such registration by means other than written test (for example, State grandfather or eminence provisions) are eligible only for positions that are within or closely related to the specialty field of their registration. For example, a candidate who attains registration through a State Board's eminence provision as a manufacturing engineer typically would be eligible only for manufacturing engineering positions.

- **Written Test:** Evidence of having successfully passed the Engineer-in-Training (EIT) examination, or the written test required for professional registration, which is administered by the Boards of Engineering Examiners in the various States, District of Columbia, Puerto Rico and Guam.

  Candidates who pass the EIT examination and complete all the requirements for a bachelor's degree in engineering technology (BET) that: (a) included 60 semester hours of courses in the physical, mathematical and engineering sciences and in engineering as listed in the basic requirements; or, (b) was in an accredited college or in a program accredited by the Accreditation Board for Engineering and Technology (ABET), may be eligible for certain engineering positions at GS-5. Eligibility is limited to positions that are within or closely related to the specialty field of the engineering technology program. Positions covered by the minimum educational requirement, which involve highly technical research, development, or similar functions requiring an advanced level of competence in basic science are excluded.

  Because of the diversity in kind and quality of BET programs, graduates of other BET programs are required to complete at least one year of additional education or highly technical work experience of such nature as to provide reasonable assurance of the possession of the knowledge, skills, and abilities required for professional engineering competence. The adequacy of this background must be demonstrated by passing the EIT examination.

- **Specified Academic Courses:** Successful completion in an accredited college or university of at least 60 semester hours of courses acceptable for credit toward a B.S. in professional engineering, in the physical, mathematical, and engineering sciences. These must have included the courses specified in the basic requirement above. The courses must also be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in the basic requirements.

- **Related Curriculum:** Successful completion in an accredited college of a full 4-year or longer related curriculum leading to a bachelor's or higher degree in engineering technology or in an appropriate professional field, for example, physics, chemistry, architecture, computer science (not computer programming), mathematics, hydrology, or geology, may be accepted in lieu of a degree in engineering provided you have at least 1 year of professional engineering experience which was acquired under professional engineering supervision and guidance.

- **Completion of Advanced Engineering Degree:** Successful completion of an advanced degree in engineering which reflects the possession of the knowledge of the basic principles, concepts, and theories or professional engineering.

June 1991
QIS-800

FIGURE 3. COPY OF OPM ANNOUNCEMENT QIS 800 (con'd)

Additional Experience and Education Requirements for all Positions:

In addition to meeting the basic qualification requirements, applicants must have either specialized experience or directly related education in the amounts shown in the table below. Applicants who meet requirements for a higher grade are also qualified for appropriate positions at lower grades.

GRADE	EDUCATION	SPECIALIZED EXPERIENCE
GS-9	2 full years of graduate level education or master's or equivalent graduate degree	1 year at least equivalent to GS-7
GS-11	3 full years of graduate level education or Ph.D. or equivalent graduate degree	1 year at least equivalent to GS-9
GS-12 and above		1 year at least equivalent to next lower grade
GS-11 research positions	Master's or equivalent graduate degree	1 year at least equivalent to GS-9
GS-12 research positions	Ph.D. or equivalent doctoral degree	1 year at least equivalent to GS-11
GS-13 and above research positions		1 year at least equivalent to next lower grade
NOTE: Education and experience may be combined to meet the above requirements.		

Specialized Experience: Experience which is in or related to the line of work of the position to be filled and which has equipped the applicant with the specific knowledge, skills, and abilities to successfully perform the duties of the position.

Graduate Education: Education above the baccalaureate level in a field of study which provided the knowledge, skills, and abilities necessary to do the work.

Completion of graduate level education in the amounts shown in the table, in addition to meeting the basic requirements, is qualifying for positions at GS-9, GS-11, and GS-12 research positions. A year of full-time graduate education is considered to be the number of credit hours which the school attended has determined represents one year of full-time study. If you cannot obtain this information from the school, 18 semester hours will be considered an academic year of graduate study.

Research Positions: Positions which primarily involve scientific inquiry or investigation, or research-type exploratory development of a creative or advanced scientific nature, where the knowledge required to successfully perform the work is typically and primarily acquired through graduate study (master's or equivalent degree for GS-11, Ph. D. or equivalent for GS-12). The work is such that the academic preparation will equip the applicant to fully perform the professional work of the position after a short orientation period.

June 1991
QIS-800

FIGURE 3. COPY OF OPM ANNOUNCEMENT QIS 800 (cont'd)

General Provisions: **The following provisions apply in crediting education or experience for any grade:**

- **For all grades, qualifying experience may be either paid or volunteer experience.**
- **Time spent in military service may be credited as an extension of experience gained immediately prior to entering the service or it may be credited on its own merits, whichever is more favorable.**
- **In order to qualify for most positions in research, development, evaluation or similar creative activities, completion of a full 4-year curriculum in an accredited college leading to a Bachelor's Degree in an appropriate field will normally be required.**

Length of Eligibility: Eligibility will be established for six months from the date you are processed into the system. Your eligibility will expire on the date shown on the front of your Notice of Results (NOR). You may extend your period of eligibility by using the reverse side of your NOR and submitting it to the address shown below.

Special Notice: *All Federal agencies in the Atlanta Region have been given direct-hire authority to make immediate offers of employment to qualified eligibles at grades GS-9 through GS-15 for positions outlined in this qualifications statement. You are encouraged to file an application directly with the agency with which you wish to be employed.*

Equal Employment Opportunity: All qualified applicants will receive consideration for employment without regard to race, creed, religion, national origin, sex, or age.

What to File:

- Employment Availability Statement, OPM Form 1203-AH
- Application for Federal Employment, SF-171
- College Course List, OPM Form 1170/17, or copy of your college transcript
- Application for 10-point Veteran Preference, SF-15 (This form is applicable only to persons claiming 10 points veterans preference.)

Where to File:

U.S. Office of Personnel Management
Huntsville Area Office
Building 600
3322 Memorial Parkway, S.
Huntsville, AL 35801-5311

June 1991
QIS-800

APPENDIX 5. GUIDELINES FOR IMPLEMENTING THE ENGINEERING CONVERSION PROGRAM

1. PURPOSE. This appendix provides guidelines for implementing and maintaining the engineering conversion program.

a. The following is a sequential checklist procedure to be used once it is determined to establish a conversion program at a location.

(1) Each responsible office planning to have personnel in the engineering conversion program must submit estimates of requirements for tuition, fees, books, supplies, etc. (in form of Memo), to support its program to ASO-17 through ASO-425 with its annual call for training requirements (does not include calculators).

(2) Each responsible office will contact the college/university to discuss and establish an acceptable procedure for administering the program and paying tuition/fees. The procedure using the SF-182 between the FAA and the college/university and having the student/sector manager initiate FAA Form 3120-5 (Authorization and Certification of Entrance or Reentrance into Training) each quarter/semester or each time the student starts a new set of courses is recommended. Books and supplies can be paid for by the student and reimbursement obtained by submitting an SF-1164 or other methods of reimbursements of official expenses.

(3) Advertise the Engineering Conversion positions and identify potential participants. NOTE: When it is determined that a sector desires to participate in the engineering conversion program, submit to ASO-425 a current copy of the college/university catalog for the development of an announcement using the current catalog course descriptions. This announcement requires mandatory approval by the Ad Hoc Review Board for Conversion before being advertised.

(4) Employee receives conditional selection letter, travel agreement forms from personnel and a Letter of Mutual Understanding for FAA participants in the engineering conversion program.

(5) Employee applies to appropriate college for acceptance.

(6) College accepts employee via letter.

(7) Employee submits copy of acceptance letter, the signed travel agreements and the signed Letter of Mutual Understanding to the receiving sector manager.

(8) Gaining office arranges release date from losing office.

(9) Release date along with acceptance letter from college and travel agreement and Letter of Mutual Understanding is sent to ASO-14 through ASO-425.

(10) ASO-14 issues permanent selection letter.

(11) PCS travel order is prepared after obtaining PCS number from ASO-421.

(12) Each responsible supervisor prepares training plan for each participant as appropriate according to background and prior credited college level courses and forwards the plan to ASO-425 for review and concurrence. NOTE: A TRAINING PLAN, INCLUDING A TIMETABLE AS IN APPENDIX 2, FIGURE 2, MUST BE DEVELOPED FOR EACH STUDENT ENTERING INTO THE CONVERSION PROGRAM. The college courses advertised for a sectors location are to be used in developing the plan. This training plan must be submitted to ASO-425 for approval and returned to the appropriate office before any college training expenses are incurred for the student. Training plans may be amended when required; however, no courses other than those shown on the approved training plan are to be taken without ASO-425 approval of the amended training plan.

(13) The responsible office estimates one full year of tuition and fees for all engineering conversion participants planning to attend the college/university and sends to the Training Branch, ASO-17, through ASO-425, for approval.

(a) On an annual basis, submit to ASO-17, through ASO-425, an annual estimate for next FY funding (submit during the annual call for training and include tuition, fees, books, supplies, etc. Use Memo/SO Form 2500-33, RIS: BU 2510-26F. Does not include calculators).

(b) Each responsible office initiates a separate SF-182 to cover the cost(s) incurred for each engineering conversion program participant planning to attend the college/university and sends it to the Employee Development Branch, ASO-17, through ASO-425, for approval at least six weeks before class start date.

(14) The following items are required each quarter/semester for each student:

(a) TRIMATE, Request for Out-of-Agency Training, approved by ASO-17. Submit via TRIMATE through ASO-425 to ASO-17. NOTE: FAA Training Order 3000.6B and Comptroller General Decision B143118 prohibits the TPMO/ASO-17 from providing administrative approval after the training has started. therefore, request for expenditures for training funds must receive administrative approval prior to starting any training. Individuals authorizing and/or attending training not previously approved will be personally responsible for the expenditures and other consequences resulting from their actions.

To prevent problems in this area, each manager is requested to submit TRIMATE request to ASO-17, through ASO-425, far enough in advance of the training start date to ensure the approval/disapproval is received back in the office or facility to allow appropriate arrangements to be made.

Additional guidance on preparing requests for out-of-agency training is contained in FAA Order 3000.6B, Chapter 11.

(b) TRIMATE Copy of the initial Request for Out-of-Agency Training, showing completed Part III - Summary of Training Completed after the student completes a quarter/semester. This is to be provided to ASO-17, via TRIMATE. A hard copy is to be provided ASO-425, within 10 days of completed training.

(c) Copy of Student Grade Report. This report to be provided to ASO-425 with the progress report in Item "e" below.

(d) FAA Form 3120-5, approved by one of the ordering officers and distributed as follows: college/university, sector files, ASO-425, ASO-17. This form should include the amount of money and the call order number.

(e) Quarterly/semester progress report (should cover engineering work assignments for that report period, training accomplished for that report period, enginecring work assignments and training planned for the next report period). Submit to ASO-425.

(f) Work schedule if tour changes. Submit to Payroll Branch, ASO-26, with a copy to ASO-425.

(15) The college/university submits the bill for tuition/fees to the address in Block 25 of the SF-182.

(16) The student purchases his/her books and supplies and gets reimbursed using SF-1164 or other methods of reimbursement for official expenses.

(17) The responsible office will submit a quarterly report of the engineering conversion program expenditures/funds required, covering tuition, fees, books, supplies, etc., to ASO-17 (copy to ASO-425) by the 20th of December, March, June, and August (mid-fourth quarter) of each year. The August report should also include estimated funds required (by quarter) for the next fiscal year. SO Form 2500-33 should be used for this report and include the school number and sub-object class in Column 1 (RIS: BU 2510-26F).

NOTE: These guidelines also apply to the TIFO and Regional Office Engineering Conversion programs.

APPENDIX 6. SPECIAL TOURS OF DUTY FOR EDUCATIONAL PURPOSES.

1. PURPOSE. This appendix provides examples of special tours of duty for educational purposes.

2. BACKGROUND. The engineering conversion program requires the students to attend school on their own time while performing 40 hours of work per week. At times, school courses are offered during the administrative workweek which does not allow the student to attend such classes because of work. Order 3600.6, Workweeks and Hours of Duty, authorizes special tours of duty of not less than 40 hours per week. Chapter 3 provides guidance concerning these special tours. Handbook 3550.10, Pay Administration, Paragraph 102, stipulates that no premium pay will be authorized as a result of the special tours of duty for educational purposes. Figure 1 of this appendix shows two examples of typical special tours of duty for educational purposes.

FIGURE 1. EXAMPLE OF SPECIAL TOURS OF DUTY

Example No. 1 shows a tour as follows:

Monday and Friday
7 a.m. - 8 a.m.; 4 p.m. - 11 p.m.

Tuesday and Thursday
7 a.m. - 3:30 p.m. (includes lunch time of 11:30 a.m. - 12 p.m.)

Wednesday
7 a.m. - 8 a.m.; 7 p.m. - 11 p.m.

Saturday
10 a.m. - 1 p.m.

Example No. 2 shows a tour as follows:

Monday and Friday
1 p.m. - 9 p.m.

Tuesday
11 a.m. - 7 p.m.

Wednesday
12 p.m. - 2 p.m.; 7 p.m. - 9 p.m.

Thursday
11 a.m. - 1 p.m.; 6 p.m. - 9 p.m.

Saturday
9 a.m. - 4 p.m.

APPENDIX 7. GUIDELINES FOR NONCOMPETITIVE PROMOTION WITHIN THE PROGRAM.

1. PROGRAM. This appendix provides appropriate guidelines for noncompetitive promotion within the program.

2. BACKGROUND. Engineering conversion program positions are advertised at the GS-11 and GS-12 levels. The GS-12 level is considered the full performance level for these positions as established in the General NAS Sectors Technical Support Staff, as well as the Technical Inspection Field Office. Employees selected into the GS-11 positions may be promoted without further competition to GS-12 subject to meeting certain requirements, since these jobs were advertised as GS-11/12 positions. Positions not filled through advertisement as GS-11/12 may not use this procedure.

a. The following are the minimum OPM guidelines for promotion within the program:

(1) The employee must have been ingrade one year.

(2) The employee must be accomplishing engineering duties at the GS-11 level to be promoted to GS-12.

(3) The employee must have a minimum of one year of documented engineering experience.

(4) The employee must be performing the duties of the position fully satisfactorily and be recommended by his supervisor.

b. Through the program, it is the responsibility of the employee's supervisor to provide progressively more difficult engineering projects, problems and/or tasks to assure the exercise and application of theoretical engineering techniques and sciences. In most situations, for the employee to perform engineering duties will require the completion of, as a minimum, some basic engineering level courses. However, there may be exceptions where the employee has been in a unique position of working with or for engineers and has gained the necessary applied experience to accomplish engineering duties. The position of engineering conversion participant includes not only the technical performance but also successful completion of the academic requirements. For courses to count toward the conversion, an overall minimum average of "C" is required.

APPENDIX 8. SAMPLE CONVERSION PACKAGE.

1. PURPOSE. Upon completion of the program, the employee is expected to make application for conversion to the Regional Human Resource Management Division. The trainee's package for conversion should contain a cover letter from the sector manager addressed to ASO-425, ATTN: Ad Hoc Review Board for Conversion. The request is to be submitted as soon as possible at the beginning of the last quarter/semester of study. This will allow the review board ample time to convene for reviewing the package. The cover letter should also state that Mr./Ms._____ will have satisfied the requirements at the conclusion of the current academic quarter/semester and that a final transcript (showing the grade/hours of the current courses) will be provided at that time. An updated SF-171 should be submitted covering the period of time since entering in the conversion program. Three full years of engineering experience is required prior to conversion to engineering series. This may be accomplished by time in the conversion program, fully documented previous engineering experience, or a combination of both. Figure 1 of this appendix shows an example of a summary of academic courses and the format they should be in for review by the Ad Hoc Review Board.

FIGURE 1. EXAMPLE OF COURSE SUMMARY.

SUMMARY OF ACADEMIC COURSES

(SHOW NAME OF COLLEGE HERE)

AREA		COURSE NUMBER/TITLE	QTR/SEM	GRADE	HOURS
Required		Math 1507 253 Calculus I	Spring 92	B	5
		Math 1508 Calculus II	Summer 92	A	5
		Math 1509 Calculus III	Fall 92	B	3
		ETC.	etc.	etc.	etc.
			"	"	"
a.	Statics, Dynamics	ESM 2201 Statics	"	"	"
		ESM 3201 Dynamics	"	"	"
b.	Thermodynamics,	ME 3720 Thermodynamics	"	"	"
c.	Strength of Material	ETC.	"	"	"
d.	ETC.	ETC.	"	"	"
e.	ETC.	ETC.	"	"	"

A college transcript is to be submitted with the application (a copy will suffice).

Submit a course description for each course listed in the Summary of Academic Courses, i.e., ESM 2201, Dynamics I, Kinematics and Kinetics of Rigid Bodies in Plane Motion.

These should be the same as in the training plan set up at the beginning of the trainee's entrance in the position. A copy of that plan will suffice.

If there are any questions concerning this procedure, please call the Training and Support Section, FTS 404-763-7085.

APPENDIX 9. FUNDING PROCEDURES FOR THE ENGINEERING CONVERSION PROGRAM PARTICIPANTS

1. PURPOSE. This appendix provides guidance and procedures for planning, using and reporting of funds required to administer the engineering conversion program.

2. BACKGROUND. Various documents have provided guidance and procedures relating to funding the engineering conversion program in the past. This order provides current procedures for funding of this program area.

3. GUIDANCE/PROCEDURE. Each responsible office planning to have personnel in the engineering conversion program shall use the following procedures to ensure funds are planned, provided, used, and reported in accordance with the budgeting and accounting procedures:

a. Submit estimates (SO Form 2500-33, Quarter Review) for tuition, fees, books, supplies, etc., required to support the program to ASO-425 during the "ANNUAL CALL FOR FY TRAINING REQUIREMENTS" (10 months before the fiscal year begins).

b. Contact the college/university and establish the estimated amount of tuition, fees, etc., and an acceptable procedure/method for paying these tuition/fees using a Standard Form-182, Request, Authorization, Agreement, and Certification of Training. The SF-182 has now been approved with certain limitations to acquire commercially available/non-government "off-the-shelf" training such as existing predeveloped standard training courses taught at and/or by a local college. Authorized costs include instructor fees, tuition, the purchase or rental of books, materials, supplies, etc. The SF-182, however, cannot be used to fund training in excess of $2500.00. Training costs exceeding this amount must be obligated through a separate purchase order. The SF-182 serves as a purchase order as well as an enrollment request. See Figure 1 of this appendix for a sample SF-182. NOTE: GENERAL INSTRUCTIONS FOR COMPLETING THE SF-182 CAN BE FOUND ON THE BACK OF THE FORM AND ADDITIONAL GUIDANCE IS CONTAINED IN THE CURRENT VERSION OF FAA ORDER SO 3000.8, MANAGEMENT OF TRAINING QUOTA AND FUNDS.

c. Each responsible office initiates a separate SF-182 to cover the cost(s) incurred for each engineering conversion program participant planning to attend the college/university and sends it to the Employee Development Branch, ASO-17, through ASO-425, for approval at least six weeks before class start date.

d. The following items are required each quarter:

(1) TRIMATE request for out-of-agency training. This form requires approval by ASO-425 and ASO-17 before the training starts. Part III, Summary of Training Completed, shall be completed via TRIMATE and returned to

ASO-17. A hard copy is to be provided to ASO-425 within ten (10) days after the training is completed.

(2) FAA Form 3120-5, approved by ASO-425, shall be used to enroll the student in the college/university each quarter/semester or each time a new set of courses is started. This form shall include the Accounting Appropriation Code, amount of money, SF-182 Document Number (Block 23), courses, dates, etc., and be distributed as follows: college/university, sector files, ASO-425.

(3) The college/university submits the invoice for tuition and fees with a copy of the SF-182 to the address in Block 25 of the SF-182. Obligation should be reported in the appropriate quarter using SO 2500-33 form. The student purchases his/her own books/supplies and gets reimbursed using SF-1164, Claim for Reimbursement on Official Business, or other appropriate methods of reimbursement for official expenses. To receive reimbursement, submit the SF-1164, a cash receipt signed (full signature) by the training institute/vendor and a copy of the TRIMATE request to ASO-17 for approval. A copy of the SF-1164 is to be sent to ASO-425. The TRIMATE request must be printed out AFTER being approved by ASO-17, but BEFORE Part III has been completed and returned to ASO-17.

(4) Quarterly budget report, using SO Form 2500-33, should be received in ASO-425 by December 20, March 20, June 20, and August 20 (mid-fourth quarter). Also a report covering estimates for the next fiscal year is due August 20. Each report shall include the school number and sub-object class in column 1 of SO Form 2500-33. All costs (tuition, fees, books, supplies, etc.,) shall be charged to cost center 1843, Fiscal Program 81R, college/university school number, and sub-object class 2555. SF-1164's and imprest funds are not obligated until the bills reach Accounting Operations Branch, ASO-22. Please ensure reports reflect the correct quarter for actual expenditures and other quarterly estimates. SF-182 charges made by the college (tuition, fees, etc.), should be a separate line item in the report from those paid by SF-1164 or other methods of reimbursement.

FIGURE 1. SAMPLE SF-182

RACT. ASO-17 FUNDED

REQUEST, AUTHORIZATION, AGREEMENT AND CERTIFICATION OF TRAINING

A. Agency code agency subelement and submitting office number — 01
B. Office use only
C. Request status (Mark (X) one) — 02: Initial or Resubmission / Correction or Cancellation

Section A—TRAINEE INFORMATION

Field	Entry
1. Applicant's name (Last-First-Middle Initial)	Walters, Sue
Enter first 5 letters of last name (03)	WALTE
2. Social Security Number (04)	123-45-6789
3. Date of birth (Year and month) (05)	
4. Home address (Number, street, city, State, ZIP code)	4174 Shinny Way, Downriver, GA 30296
5. Home telephone	Area code 404, Number 555-7760
6. Position level (Mark (X) one only)	X a. Non-supervisory; b. Supervisory; c. Manager; d. Executive
7. Organization mailing address (Branch-Division/Office/Bureau/Agency)	Airway Facilities Division, ASO-400, East Point, GA 30344
8. Office telephone	Area code 404, Number 555, Extension 3567
9. Continuous civilian service	Years 8, Months 1
10. Number of prior non-government training days	
11a. Position title/function	Secretary/Typing
11b. Applicant handicapped or disabled (See instructions)	
12. Pay plan/series/grade/step	GS/318/6/3
13. Type of appointment	Career
14. Education Level	12

Section B—TRAINING COURSE DATA

15a. Name and mailing address of training vendor (No., street, city, State, ZIP code)
OPM Training Registrar, Suite 940
75 Spring St., S.W., Atlanta, GA 30303

15b. Location of training site (If same, mark box)
Swissotel, 3391 Peachtree Rd.
Atlanta, GA 30971

16. Course title and training objectives (Benefits to be derived by the Government)
Secretarial Skills: The purpose of this training is to enhance the employee's proficiency in her position.

17. Catalog/Course No.

18. Training period (6 digits) (06)	Year	Month	Day
a. Start	92	04	24
b. Complete	92	04	24

19. No. of course hours (4 digits) (07)	
a. During duty	0008
b. Non-duty	
c. TOTAL	0008

20. Training codes (See instructions)	Code			Code	
a. Purpose	4	08	c. Source	2	10
b. Type	6	09	d. Special interest	0	11

AGENCY USE ONLY
TRIMATE # 2003167

Section C—ESTIMATED COSTS AND BILLING INFORMATION

21. Direct costs and appropriation/fund chargeable

Item	Dollars	Cents	Appropriation/fund
a. Tuition	$ 100	00	7/201.0/1843/81W 2555
b. Books or materials			
c. Other (Specify)			
d. (Enter 4 digits in dollar column) TOTAL (12)	$ 100	00	

22. Indirect costs and appropriation/fund chargeable

Item	Dollars	Cents	Appropriation/fund
a. Travel	$		
b. Per diem			
c. Other (Specify)			
d. (Enter 4 digits in dollar column) TOTAL (13)	$		

23. Document/Purchase Order/Requisition No.
ASO-3167-WALT

24. 8-Digit station symbol (Example—12-34-5678)
69-00-1104

25. BILLING INSTRUCTIONS (Furnish invoice to)
DOT/FAA, SOUTHERN REGION
P. O. Box 45719
ATTN: ASO-22A
Atlanta, GA 30320

Section D—APPROVALS

26a. Immediate supervisor—Name and title
Vicke Smith
Manager, ASO-407
Area code/Tel. No./Extension: 404/555-4077
b. Signature: Vickie Smith — Date: 3/15/92

27a. Second-line supervisor—Name and title
Melissia Cook
Manager, ASO-400
Area code/Tel. No./Extension: 404/555-5437
b. Signature: Melissia Cook — Date: 3/16/92

28a. Training officer—Name and title
Monica Brown
Supervisor, ASO-425H
Area code/Tel. No./Extension: 404/555-4257
b. Signature: Monica Brown — Date: 3/18/92

Section E—APPROVAL/CONCURRENCE

29a. Authorizing official—Name and title
Manager, Employee Development Branch
Area code/Tel. No./Extension: 404/763-7508
b. Signature: Robert C. Dixon — ✓ Approved / Disapproved — Date: 3/20/92

Section F—CERTIFICATION OF TRAINING COMPLETION

30a. Certifying official—Name and title
Area code/Tel. No./Extension

LEAVE BLANK

TRAINING FACILITY ▶ Bills should be sent to office indicated in Item 25. • Please refer to number given in Item 23 to assure prompt payment.

Copy 1—AGENCY (TRAINING/PERSONNEL FOLDER)
NSN 7540-01-006-3801 Previous edition usable
182-106
Standard Form 182 (Rev. 12/79) (10 Parts)
U.S. Office of Personnel Management FPM Chapter 410

APPENDIX 10. GENERAL INFORMATION, QUESTIONS AND ANSWERS RELATING TO PROGRAM OPERATION.

1. PURPOSE. The Technical Support Staff (TSS) Engineering Student Trainee Program (now engineering conversion program) was developed based on experience gained in a similar program used in the Division in the Evaluation Staff's Technical Inspection Program.

a. The special announcement used to solicit employee bids to fill the positions in the sectors provides a listing of required courses to meet the OPM Announcement, Specified Academic Courses Alternate Method for the school selected at each sector location.

b. The program was designed to allow flexibility by the sector manager in managing the program. The following are questions and answers relating to the Engineering Student Trainee Program, GS-899, (now engineering conversion program) for Sector Technical Support Staff Program operation:

Question: How many school semesters or quarters should the student attend each calendar year?

Answer: Either two semesters or quarters. Work requirements of the TSS should be considered along with courses required by the employee and the times the particular school teaches the required courses. The sector manager, after considering these requirements, has the option of approving any two quarters or semesters (including summer semesters) during a calendar year/school year. The sector manager at his option may allow the attendance at school of more than two quarters or semesters a year.

Question: Can the employee be required to travel during the time he/she is attending school?

Answer: Every effort should be made to preclude the employee from having to miss any portion of a class. The same guidelines used when the employee is assigned to school at the Academy should be used since we are funding for this schooling.

Question: What if an employee wishes to expedite the academic portion of the program by paying his/her own way and going to school a quarter/semester when the sector manager has planned a work period involving possible travel?

Answer: In the past, we have adjusted work schedules at the duty station to permit this so long as it did not jeopardize the work required and the employee fully understands that travel requirements of the job come first, which may result in missing classes.

Question: If an employee has veteran's benefits relating to schooling, can he use these in these program?

Answer: Yes, provided the Sector Manager concurs, the courses taken are a part of the program, and FAA does not provide any supplemental payment of any type during the period the veteran's benefits are used. Basically, we would only assure the training program is being pursued and work hours are adjusted during the quarter or semester we would normally have set up for the program. If used outside the program, then guidance in answer to question number 3 would be used.

Question: What does FAA pay for in this program?

Answer: Tuition, required textbooks and special school supplies not available from FAA's office supplies. Students are responsible for any calculators required and transportation to and from school.

Question: Does this program provide for on-the-clock study time or classroom time?

Answer: No. This program only provides for reimbursement for expenses as stated in the previous question. The employee is required to work 40 hours per week.

Question: Are there limits on how work hours can be adjusted?

Answer: Employees can work no more than eight hours per day. No premium pay can be paid for hours worked before 6 a.m. or after 6 p.m., because hours are adjusted for training purposes. Employees can work Monday through Saturday for a total of 40 hours. Employees cannot work on Sunday since premium pay cannot be paid for hours adjusted for training purposes. Other than the above hours, work schedule should be adjusted to accommodate class schedules. Refer to Appendix 7, Special Tours of Duty for Educational Purposes.

Question: How are adjusted work hours handled on the employee's T&A?

Answer: A letter is prepared to Accounting (ASO-20) as soon as hours of work are determined versus hours away attending school showing how the 40 hours each week will be accomplished; T&A reports are then documented for actual hours worked. Note added to T&A that no premium pay is authorized for adjusted work hours as they were adjusted for training purposes.

Question: Does this program provide for a degree?

Answer: No. Directives preclude providing training for the purpose of obtaining a degree. However, depending on circumstances, a degree may be obtained. Example: Employee already has sufficient credits when added to those required in this program so that the government has no additional cost and the employee still meets degree requirements. Example 2: Some schools charge a fixed amount for tuition after a minimum number of hours are scheduled and thus no charge for additional hours to a full quarter or semester load. The employee would be expected to fund for the books and other

related costs of nonprogram required courses. Employees should be cautioned, however, not to overload themselves as failure of a required course is grounds for removal from the program. Also, the sector manager may not be willing to adjust work hours to accommodate the additional nonprogram required courses. Example 3: Employee obtains on his own expense and time the courses not required by program to obtain degree.

Question: What problems can occur if the employee requests to take courses other than those developed as required and published in the announcement for the position?

Answer: Approval should be obtained through ASO-425, who will assure the course meets program requirements, prior to spending government funds and the student's time in the course.

Question: Can the employee enroll in a school other than the one used in the announcement?

Answer: Yes. However, the courses must be transferable to an Engineering School with at least one Engineering curriculum accredited by the Accreditation Board for Engineering and Technology (ABET).

Question: Are there any set academic standards for the program?

Answer: Yes. They are set basically by the Engineering school attended and OPM requirements. The 60 semester/90 quarter hours of required courses must be accepted as counting toward a BS Degree in Engineering, thus a "C" average or better must be maintained.

Question: If the trainee fails the program, is there a possibility that he/she would have to geographically relocate?

Answer: If the employee fails the training courses, there is a possibility that he/she will be relocated. This is in accordance with the training agreement signed by the employee which states that he/she would be reassigned to an available position for which he/she qualifies. The position would be similar to the position from which the employee was first selected into the GS-899 program (now engineering conversion program) and could be at any location in the region at which a vacancy was available.

Question: Some colleges require several nontechnical prerequisite courses prior to entering the technical school. Will the agency pay for the courses?

Answer: If the courses are required by the university or college as prerequisites for continuing in the engineering curriculum and are in the standard engineering curriculum, FAA would pay for the courses the same as for other required courses. Individual situations of this type should be coordinated with ASO-425 for clearance with ASO-17 prior to entering school by the employee.

Question: In locations where there are no technical schools, if an employee entered and completed a two-year pre-engineering program, would the agency pay for a PCS move to a location where the employee could then enter a technical program?

Answer: Since the GS-899 Engineering Student Trainee Program (now engineering conversion program), is not for the purpose of obtaining a degree, but rather for meeting alternate requirements for conversion, a two-year pre-engineering school usually would only be able to provide two or three courses in physics, and two or three courses in calculus. An employee would only be able to obtain approximately 18 semester hours which would count towards the 60 semester hours required for conversion. Based on this, it would not appear cost effective to set up a program with a pre-engineering school to be followed by a PCS move to a location having an engineering school available.

APPENDIX 11. CONVERSION BOARD

1. PURPOSE. This appendix provides guidance for the establishment of the Review Board for the engineering conversion program.

2. BACKGROUND: An integral part of the engineering conversion program is the Review Board. This appendix will present guidelines for selection of board members and outline duties of the board. The initial Review Board was implemented in the mid-seventies when the GS-899 Engineering Student Trainee Program was established. The members were appointed by the division manager and consisted of three engineers and a representative from ASO-14. The appointments were permanent or until a member left the Regional Office (RO). There have been several new appointments recently and, with the implementation of this order, SO 3410.9, Airway Facilities Engineering Conversion Program, the appointments to the Review Board will be for a five-year term or until a member leaves the RO. To allow for staggering of its membership, the current engineers on the board will be retroactive to the beginning of their term.

a. Selection: There will be five voting board members and one non-voting member as follows:

- Engineer from ASO-450
- Engineer from ASO-460
- Engineer at large
- Supervisor, ASO-425
- Human Resource Management Division
- ASO-425 Program Manager for engineering conversion program; non-voting member

b. Selection Criteria for board members:

- The three engineer members will be appointed by the AF Division Manager, and will be for a five-year term.
- Participation of the ASO-425 Program Manager for the engineering conversion program will be as a resource only and a non-voting member of the board.
- Engineers on the board should be GS-13 or above.
- Chairman of the board is the ASO-425 supervisor.

c. Duties of the board members.

The board will:

- Review/approve vacancy announcements associated with the program prior to advertising
- Review/approve training plans
- Rule on requirements fulfilled
- Only be involved in conversion of engineers in the engineering conversion program.