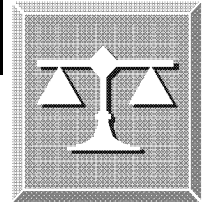


TS-45 October 1981

**Federal Wage System
Job Grading Standards**



WCPS-2 August 2002

**FEDERAL WAGE SYSTEM
JOB GRADING
STANDARD
FOR
OFFSET
PHOTOGRAPHY,
4414**



**Workforce Compensation
and Performance Service**



OFFSET PHOTOGRAPHY, 4414

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WORK COVERED

This standard is to be used for grading the nonsupervisory work of operating photographic equipment such as precision process cameras, scanners, and contact frames to make line, continuous tone, halftone, and color separation negatives and positives required for the preparation of lithographic printing plates. The offset photographer may also process film using tray development techniques and automatic film processing equipment.

The work requires knowledge of photographic equipment operations, techniques, and processes, and a practical understanding of the relationship between offset photography and other offset work operations involved in the lithographic reproduction of single-color and multicolor materials such as manuals, handbooks, pamphlets, maps and charts, and medical atlases.

Offset photographers apply knowledge and skill in the evaluation of copy; adjustment of camera and other equipment control settings; use of lenses, filters, halftone and special pattern screens, and photographic materials; selection and arrangement of lighting; determination of the type and number of exposures needed; use of photographic procedures and methods such as enlarging and reducing, dropout, dodging, compositing, vignetting, process color separation, and color correction; and film processing. The work also involves skill in mounting and registering copy, and in the use of instruments such as timers, light and light integrating meters, densitometers, dot percentage readers, and exposure computers.

WORK NOT COVERED

This standard covers work involving the use of photographic equipment, techniques, and processes only when such work is performed for the purpose of making negatives and positives for use in the preparation of lithographic printing plates. All other work is excluded. Thus, this standard does not cover the following work:

- 1 Use of camera equipment and/or photographic laboratory processing to achieve artistic purposes such as the production of aesthetic objects or the creation, communication, and evocation of aesthetic effects sought by the photographer (including emotions, moods, attitudes, or memories of a special nature). Typical of such work is the taking and/or printing of continuous tone photographs to make portraits of individuals, record or report public events and ceremonies, or create original copy for special purposes, such as for incorporation in posters, displays, or models. (See the classification standard for the [Photography Series, GS-1060](#).)
2. Operation of photographic equipment, photographic processing, or any combination of both, in connection with the accomplishment of work operations or research activities in scientific, engineering, medical, graphic, or other fields of endeavor (excepting lithographic reproduction).

Positions performing such work as their primary duty are classified in the [Photography Series, GS-1060](#), when such work has as its paramount requirement knowledge and experience in the use of the equipment, techniques, and processes of photography. This



includes positions performing work which, in addition to a paramount requirement for photographic knowledge and experience, also necessitates some subject matter knowledge of the work operations or research activities involved. Typical of such work are:

Operation of micro-imagery cameras and related equipment to produce photographic miniaturizations such as of airway patterns on video projection plates. (See the classification standard for the [Photography Series, GS-1060](#).)

Operation of precision reduction and blowback cameras to (a) make reduced negatives for the purpose of preserving and facilitating the storage of maps, charts, documents, or other materials of historical, scholarly, or other interest, and (b) make blowback prints from the mininegatives for a variety of purposes, including use in the development and construction of cartographic products (for example, as base maps used in the cartographic compilation of new or revised maps). (See the classification standard for the [Photography Series, GS-1060](#).)

Operation of various types of copy cameras to produce high resolution, reduced microprecision black and white negatives and positives for use on cartographic stereoplotting, mensuration type equipment. (See the classification standard for the [Photography Series, GS-1060](#).)

3. Performance of photographic work in connection with other fields of endeavor when such work has as its paramount requirement subject matter knowledge and experience in the work operations or research activities involved. Positions performing such work as their primary duty are classified in the appropriate subject matter series under the General Schedule.

Typical of such work are rectification to remove distortions and/or precision enlargement or reduction (scaling) of aerial photographs for use in the development and construction (as distinct from the offset reproduction) of controlled photo maps. For example, the production of matched photographic color film and print materials for use in laying mosaic is excluded, regardless of the possible subsequent use of photomosaics as original copy in reproduction processes. (See the classification standard for the [Cartographic Technician Series, GS-1371](#).)

4. Set up, adjustment, operation, and monitoring of microform equipment such as computer output microfilmers, planetary cameras, rotary cameras, step and repeat cameras, and automated microfilm processors. (See the classification standard for the [Equipment Operator Series, GS-0350](#).)
5. Operation of computerized equipment to generate or enhance photographic images used in the creation of cartographic products. (See appropriate classification standards for series under the General Schedule, such as [Cartographic Technician, GS-1371](#), or [Computer Operation, GS-0332](#).)

6. Analysis of continuous tone color separation negatives and positives in comparison with original films, color illustrations, or other original copy to determine the amount of color correction and percentage of color required, and altering tone values using masking, staining, and tray or local etching.
7. Development of motion picture film and related work including machine operations in matching, cutting, and splicing negatives; film development and printing; film cleaning and slitting; washing, splicing, and assembling film strips; and mixing development solutions. (See appropriate occupations in the [Film Processing Family, 9000.](#))
8. Processing photographic images onto paper, plastic, or metal plates which are used in the offset reproduction of printed matter. This exclusion also applies to the operation of photo-direct or electrostatic equipment to make paper or plastic masters/plates. (See the FWS Job Grading Standard for [Offset Platemaking Jobs, 4416.](#))
9. Preparation of metal templates by photographic methods of transferring drawings to light sensitized surfaces of metal stock. (See [Metal Phototransferring, 3735.](#))
10. Operation of copier/duplicator equipment such as xerographic or electrostatic copiers, diazo equipment, and photostat equipment. (See the classification standard for the [Equipment Operator Series, GS-0350.](#))
11. Making zinc, brass, and copper plates for use in letter press printing. (See [Photoengraving, 4425.](#))

TITLES

Jobs graded by this standard are to be titled *Offset Photographer*.

GRADE LEVELS

This standard describes four levels of nonsupervisory offset photography work (grades 7, 9, 10, and 11). Depending on the nature of the work performed, any one of these grade levels may represent the highest nonsupervisory level or full performance level of offset photography work found in a particular offset photography work situation or organization.

However, this standard does not describe all possible grades at which jobs may be established in this occupation, or in any way limit the authority of agencies to assign work or particular duties to positions. If jobs differ substantially from the levels of skill, knowledge, and other work requirements of the grades described in this standard, they may warrant grading either above or below these grades, based on the application of sound job grading principles.



HELPER AND INTERMEDIATE JOBS

Under the Federal Wage System, the [Job Grading Standard for Trades Helper](#) jobs is used to grade helper jobs only in work situations in which the full performance level of nonsupervisory work is grade 9 or higher. Similarly, the [Job Grading Standard for Intermediate Jobs](#) applies to jobs that are a part of a planned program of training and development of skills for advancement to a higher grade when the level of the target job is grade 9 or above. (In applying the Intermediate Job Grading Table, the grade to be used as the "journey level grade" is the grade of the full performance target job, as determined by application of this standard.)

NOTES TO USERS

Verifiers. Due to the requirement for accuracy and other quality standards in the printing processes, and the great number of discrete items of information to be conveyed, it is common practice to assign to some senior employees the task of reviewing projects to assure that all assigned work has been performed, that accuracy and other quality standards have been met, and that no errors have been introduced during the process of accomplishing the work. This review and verification work must be graded by reference to the [Job Grading Standard for Inspectors](#).

The review of numerous projects does provide the verifier with a broad understanding of the work of the unit and the capabilities of the other workers. As a result, the verifiers are often given additional assignments to evaluate and report on the work of the other employees of the unit or to provide training, advice, and assistance to a small group of employees. If such additional work is being performed, it must be graded by reference to the [Leader](#), [Supervisor](#), or other appropriate standards in accordance with the [procedures for grading mixed jobs under the Federal Wage System](#).

Nature of Copy Materials. A great variety of different kinds of copy materials are photographed and reproduced lithographically by the various departments and agencies of the Federal Government. Because there are so many of them, only a few of these kinds of copy materials are mentioned in the Work Covered section of this standard and no further specific reference is made to them in the grade level descriptions. Instead, the grading criteria are expressed in terms of the nature of the copy (for example, line or tone, single-color or multicolor), and the quality and other requirements of the work. Thus, the grade level criteria described at the various grade levels in this standard apply, as appropriate, to jobs involving the offset photography of a wide range of copy materials. For example, the fact that copy materials such as maps, charts, or medical illustrations are not specifically identified at particular grades in this standard does not in any way preclude the applicability of the grading criteria to work involved in the photography of such copy materials.



4414-7**OFFSET PHOTOGRAPHER, GRADE 7****4417-7**

General. Grade 7 offset photographers independently photograph a variety of line reflection and/or transmission copy materials to make negatives and positives required for the preparation of lithographic printing plates subsequently used in the single-color reproduction of printed matter. The copy photographed consists of single-color and/or multicolor line materials of uniform value over all components.

Work performed at this level requires skill and knowledge in the operation and use of one or more process cameras and other photographic equipment; practical understanding of the principles, procedures, and techniques of same size photography and photographic enlarging, reducing, and compositing; and ability to determine camera settings, select lenses and film, center and align copy on copy board, arrange light sources to assure balanced illumination of copy, and expose and process film so as to meet work order, specification, and other quality requirements.

In accomplishing their work, grade 7 offset photographers follow work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. At this grade level, tolerance requirements concerning scale and dimensions, alignment registration, and line weight range from visually close (not requiring optical measurement) to hairline tolerances (not closer than plus or minus .003 inch).

Skill and Knowledge: Grade 7 offset photographers must have knowledge of basic photographic principles, procedures, and methods to accomplish different types of work including same size photography, compositing, enlarging, and reducing of a variety of single-color line reflection and/or transmission copy materials. This also includes skill and knowledge in the photography of multicolor line copy when such copy is treated as single-color copy, and negatives and positives are made as required for the preparation of printing plates subsequently used in single-color reproduction.

They apply skill and knowledge in operating one or more process cameras, and a variety of other photographic equipment, accessories, materials, and facilities such as vacuum contact frames, light sources, lenses of various focal lengths, various types of film (for example, blue-sensitive, orthochromatic, panchromatic), chemical developers and fixers, film processors, and/or darkroom facilities. This includes knowledge of standard procedures and practices for determining camera and other equipment settings, and for controlling the variables involved in exposing film, such as the dimensions of the copy and the desired degree of enlargement or reduction (if any); type and speed of film; focal length of the lens; distances between the copy (object), lens, and focal (image) planes; number, type, and positioning of light sources, their distance from the copy board, and the intensity and evenness of illumination at the focal plane (i.e., on the ground glass of the camera); length of exposure; and aperture setting (i.e., lens opening or F-stop).

In developing film, grade 7 offset photographers similarly apply knowledge of the basic procedures and techniques involved. When operating film processors, they must control

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variables such as the speed of the processor, temperature, and rag of replenishment of processor chemistry. When developing film manually, offset photographers at this level apply knowledge of darkroom procedures and use of safety lights, and are skilled in the techniques of still and agitated tray development.

Grade 7 offset photographers must be skilled in mounting and centering copy; handling film (both camera back and in the darkroom) to prevent unwanted exposure or loss of film; checking for correct camera focus; aligning several overlays of copy for simultaneous exposure; using punch, pin, or other registration systems; mixing chemical solutions in standard proportions; performing operator maintenance of equipment (such as cleaning, oiling, and adjusting); and using a variety of photographic instruments and aids' such as integrating or other light meters, focusing scales, densitometers, timers, test strips (for example, using six step gray control strips to check on the chemistry of film processors), and proportion scales in slide rule or circular form. They must also apply knowledge of arithmetic and be able to make calculations involving fractions, decimals and proportions (for example, in scaling copy).

Responsibility: Grade 7 offset photographers perform their work on the basis of work orders, and verbal or written instructions from the supervisor. At this level, offset photographers are responsible for independently determining the procedures and methods required, and for accomplishing routine or repetitive types of assignments in accordance with specification requirements and other directly applicable guides such as technical manuals, information provided by manufacturers of photographic equipment and materials, and established practices (for example, arrangement of light sources to assure balanced exposure, adjustment of exposure as required by the number of overlays being composited, and substitution of auxiliary lenses for the standard process camera lens so as to increase the enlargement or reduction range of the camera). This includes responsibility for grouping (batching) similar assignments to increase efficiency in performing the work, and for following safe work practices and procedures in operating equipment, mixing chemicals, and handling photographic materials.

In addition to assuring balanced exposure, proper density and image fidelity, and consistency in sharpness and clarity of detail, grade 7 offset photographers also are responsible for assuring that completed products meet tolerance requirements concerning scale, dimensions, alignment registration, and line weight which range from visually close (not requiring optical measurement) to hairline tolerances (not closer than plus or minus .003 inch).

Completed work is checked for compliance with instructions, established practices, and specification requirements.



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Physical Effort: The work involves prolonged standing, frequent walking, and occasional climbing, bending, and crouching such as when checking and operating equipment, and obtaining materials. Offset photographers frequently handle objects weighing from 11 to 20 kilograms (25 to 45 pounds) and, occasionally, objects weighing in excess of 20 kilograms (45 pounds), for example, in setting up work or lifting, carrying, pushing, or pulling containers of chemicals, films, and other photographic materials.

Working Conditions: The work is done indoors, in areas that are normally well heated and ventilated. It involves exposure to fumes, odors, and the possibility of skin, eye, or other irritation from photographic chemicals. Offset photographers may be exposed to ultraviolet illumination, eye irritation from high intensity light sources, and eye strain when working under subdued lighting or in dark rooms. There is also a possibility of cuts in handling photographic materials and operating photographic equipment under subdued lighting, as well as electrical shock and burns from lighting systems or other electrically powered equipment. There is discomfort when wearing protective clothing such as face shields, goggles, rubber or nylon gloves, and aprons.

4414-9**OFFSET PHOTOGRAPHER, GRADE 9****4414-9**

General: Grade 9 offset photographers independently operate one or more process cameras and other equipment, and photograph a variety of multicolor line reflection and/or transmission copy materials, to make negatives and positives required for the preparation of lithographic printing plates subsequently used in the multicolor reproduction of printed matter. The copy consists of multicolor line materials with areas of inconsistent tone or other deficiencies such as faded type matter, uneven color, or stains. (Single-color line materials may be included if they are photographed in combination with such multicolor line copy.)

In comparison with the application of standard procedures and methods to photograph a variety of copy materials involving line copy of uniform value over all its components, for use in connection with single-color reproduction as described at the grade 7 level, grade 9 offset photographers must apply more skill and knowledge in modifying standard procedures and using additional methods including filter techniques, dodging, dropout, and masking, to correct or enhance poor copy (for example, strengthen weak images and even out overly strong ones), and accomplish nonprocess color separation of multicolor materials.

Grade 9 offset photographers perform their work on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. In comparison with tolerance requirements ranging from visually close to hairline, as described at the grade 7 level, work performed at this level involves tolerance requirements with respect to scale and dimensions, alignment registration, and line weight which range from hairline tolerances of plus or minus .003 inch to critical (e.g., plus or minus .001 inch) or finer tolerances.

Note: Some offset photographers at this level may perform work involving the application of halftone methods and techniques similar to those described at the grade 10 level. Although not further described at this level, such work is graded at the grade 9 level when it is performed only in connection with single-color reproduction, does not involve critical tolerance and halftone quality requirements, or use of the full range of equipment, procedures, and methods described at the grade 10 level. When the work differs even more substantially from the duties described at the grade 10 level (for example, halftone photography limited to use of contact frames), such work should be graded by cross comparison with the job grading standard for Offset Platemaking, 4416.

Skill and Knowledge: Grade 9 offset photographers must have knowledge of photographic principles, procedures, and methods to accomplish different types of work, including same size photography, compositing, enlarging, and reducing of a variety of reflection and/or transmission copy materials. At this level, the copy photographed consists of multicolor materials with areas of inconsistent tone or other deficiencies. Grade 9 offset photographers must be skilled in photographing such multicolor line copy, or combinations of such multicolor line copy with single-color line materials.



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They apply skill and knowledge in operating one or more process cameras, and a variety of other photographic equipment, accessories, materials, and facilities such as vacuum contact frames, light sources, lenses of various focal lengths, filters, van type of film that differ in their sensitivity to different portions of the light spectrum (for example, blue sensitive, orthochromatic, panchromatic) and in other characteristics (such as size, speed, and contrast), chemical developers and fixers, film processors, and darkroom facilities.

In comparison with the use of standard procedures and practices to determine camera and other equipment control settings, and photograph line copy of uniform value, as described at the grade 7 level, grade 9 offset photographers must apply more skill and knowledge to examine and evaluate copy; determine its condition; and select, adjust, or modify the procedures, including camera and other equipment control settings, to be used in exposing and processing film so as to enhance weak images or compensate for any other deficiencies in the copy.

At the grade 9 level, offset photographers require a thorough knowledge of the relationships among the variables which must be controlled in exposing and developing film, such as the dimensions of the copy and the desired degree of enlargement or reduction (if any); type and speed of film; focal length of the lens; distances between the copy (object), lens, and focal (image) planes; number, type, and positioning of light sources, their distance from the copy board, and the intensity and evenness of illumination at the focal plane (i.e., on the ground glass of the camera); length of exposure; and aperture setting (i.e., lens opening or F-stop). Grade 9 offset photographers apply knowledge of the relationships among these variables to determine the variations from standard procedures which are required to produce specifically intended results (for example, increasing exposure to strengthen line weight as needed in one portion of the copy, while dodging other parts of the copy to prevent overexposure; increasing agitation during film development to improve contrast; or changing the temperature of the chemical baths and the length of film immersion to compensate for overexposure or underexposure).

Grade 9 offset photographers, in addition to the methods and techniques required at the grade 7 level, must have skill and knowledge in the use of filter techniques to perform nonprocess color separations and to enhance weak images as required by the condition of the original copy. This includes application of knowledge of the ability of various filters to absorb differing portions of the light spectrum, and to determine the filters to be used for separating colors on a single negative or changing color intensities of original copy as required to correct deficiencies. Offset photographers, at this level, also must have knowledge of the adjustments required in exposure because of the use of filters. In addition, they must be skilled in manipulating the exposure of parts of the copy being photographed, for example, by manually shielding light from a particular area of the negative during a portion of the exposure time (dodging); preparing and using photographic drop out masks, mechanical masking materials (such as tape or goldenrod), and filters to drop out unwanted parts of the image area; and preparing color proofs (using wet and/or dry methods).

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Grade 9 offset photographers must be skilled in mounting and centering copy; handling film (both camera-back and in the darkroom) to prevent unwanted exposure or loss of film; checking for correct camera focus; aligning several overlays of copy for simultaneous exposure; using punch, pin, or other registration systems; mixing chemical solutions in standard proportions; performing operator maintenance of equipment (such as cleaning, oiling, and adjusting); and using a variety of photographic instruments and aids, such as integrating or other light meters, focusing scales, densitometers, timers, test strips (for example, using six step gray control strips to check on the chemistry of film processors, or 21-step gray scales to note variations in illumination that occur as light sources age), and proportion scales in slide rule or circular form. They must also apply knowledge of arithmetic and be able to make calculations involving fractions, decimals, and proportions (for example, in scaling copy, or determining nonstandard camera and other equipment settings).

Responsibility: Grade 9 offset photographers perform their work on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. In comparison with the accomplishment of routine or repetitive assignments in accordance with directly applicable guides such as technical manuals, information provided by manufacturers of photographic materials and equipment, and established practices, as described at the grade 7 level, grade 9 offset photographers are responsible for independently evaluating copy involving areas of inconsistent tone or other deficiencies, determining the specific nature of the problem, and applying judgment in selecting and adapting photographic methods and techniques as required to enhance or correct the deficiency. They are also responsible, as described at the grade 7 level, for following safe work practices and procedures in operating equipment, mixing chemicals, and handling photographic materials.

In addition to assuring balanced exposure, proper density, and image fidelity, as described at the grade 7 level, offset photographers at this level are also responsible for assuring that completed work meets quality standards with respect to consistency of tone in the image area and color. In comparison with tolerance requirements ranging from visually close to hairline tolerances not tighter than plus or minus .003 inch, as described at the grade 7 level, grade 9 offset photographers are responsible for meeting more difficult tolerance requirements concerning scale, dimensions, alignment registration, and line weight which range from hairline tolerances of plus or minus .003 inch to critical (e.g., plus or minus .001 inch) or finer tolerances. For example, some work at this level may involve line weight tolerance standards for type and symbols, such as in map and chart or other critical reproduction products, which do not permit any deviation.

Completed work is checked for compliance with instructions, specification requirements, and trade practices.

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Physical Effort: The physical effort required at this grade is the same as that described at [grade 7](#).

Working Conditions: The working conditions at this grade are the same as those described at [grade 7](#).

4414-10**OFFSET PHOTOGRAPHER, GRADE 10****4414-10**

General: Grade 10 offset photographers independently operate one or more process cameras and other equipment, apply and adapt the full range of standard halftone methods and techniques, and photograph a variety of multicolor tone reflection and/or transmission copy materials to make negatives and positives required for the preparation of lithographic printing plates subsequently used in the multicolor reproduction of printed matter. The copy consists of multicolor tone materials which contain areas of inconsistent tone or other deficiencies, such as weak images or inadequate contrast. (Line and single-color materials may be included if they are photographed in combination with such multicolor tone copy.)

In comparison with the photography of multicolor line copy which includes areas of inconsistent tone or other deficiencies, as described at the grade 9 level, grade 10 offset photographers apply greater knowledge and skill in evaluating multicolor tone copy and determining its density range by means of gray scales and instruments such as densitometers; photographing such copy using multi-function exposure methods (e.g., three stop, exposure and flash) and a variety of halftone, special pattern, and tint screens; and controlling and improving negative/positive dot formation during both the exposure and processing phases of the work.

Grade 10 offset photographers perform their work on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. At this grade level, tolerance requirements with respect to scale and dimensions, alignment registration, and line weight range, as at the grade 9 level, from hairline tolerances of plus or minus .003 inch to critical (e.g., plus or minus .001 inch) or finer tolerances. However, in addition, grade 10 offset photographers must meet critical, controlled requirements concerning other parameters such as dot size and density, faithful reproduction or enhancement of the tonal range of the original copy, color balance, contrast, and avoidance of moire effects.

Skill and Knowledge: Grade 10 offset photographers must have knowledge of photographic principles, procedures, and methods to accomplish different types of work, including same size photography, compositing, enlarging, reducing, and making nonprocess color separation negatives and positives of a variety of reflection and/or transmission copy materials. At this level, the copy photographed consists of multicolor tone materials with areas of inconsistent tone or other deficiencies. Grade 10 offset photographers must be skilled in photographing such multicolor tone copy, or combinations of such multicolor tone copy with single-color and line materials.

They apply skill and knowledge in operating one or more process cameras, and a variety of other photographic equipment, accessories, materials, and facilities such as vacuum contact frames, light sources, lenses of various focal lengths, filters, various types of film that differ in their sensitivity to different portions of the light spectrum (for example, blue sensitive, orthochromatic, panchromatic) and in other characteristics (such as size, shape, speed, and contrast), chemical developers and fixers, film processors, and dark room facilities. Grade 10 offset photographers also must have thorough



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knowledge of the specific effects of variations from standard procedures, including camera and other equipment control settings, and of the relationships among the variables which must be controlled in exposing and developing film, as described at the grade 9 level, such as the dimension of the copy and the desired degree of enlargement or reduction (if any); type and speed of film; focal length of the lens; distance between the copy (object), lens, and focal (image) planes; number, type, and positioning of light sources, their distance from the copy board, and the intensity and evenness of illumination at the focal plane (i.e., on the ground glass of the camera); length of exposure; and aperture setting (i.e., lens opening or F-stop).

However, in addition to the selection, adjustment, and modification of procedures (including camera and other equipment control settings); use of filter techniques and methods such as dodging, dropout, and masking to correct or enhance poor copy; preparation of color proofs; and nonprocess color separation of multicolor copy materials as described at the grade 9 level, grade 10 offset photographers must apply greater skill and knowledge in the use of a variety of screens such as magenta, gray, and glass cross line halftone screens with various rulings (e.g., 100-, 120-, 133-, 200-, 250-line screens or finer), special pattern screens (such as random dot, bullseye, straight line, bi-angle, and symbol), and tint screens in various strengths (ranging from 5 percent to 95 percent).

Grade 10 offset photographers must have skill and knowledge in the use of gray scales and densitometers to examine and evaluate copy, determine its tonal range, and identify specific problems with respect to inconsistencies in tone or other deficiencies. In addition to the variables considered in performing work as described at the grade 9 level, grade 10 offset photographers must apply greater knowledge in determining the multifunction exposure method to be used such as two-stop or three-stop, and/or use of flash exposures to harden highlight dots, and the sequence of exposure, to assure coverage of the tonal range of the copy including highlight, middle tone, and shadow detail. In determining the method of exposure and accomplishing the work (for example, direct or indirect screening of copy), the offset photographer must consider the possible use of other equipment, such as contact frames in conjunction with contact screens, to supplement the process camera; select film with optimal values for the work to be done, considering the speed, range, and contrast of the film in relation to the needs of the copy; select and position screens at appropriate angles to avoid the appearance of undesirable patterns (moire effects) in the final product (i.e., after reproduction); determine and adjust lens aperture, camera extension, and screen distance in relation to screen aperture as required for correct dot formation on halftone negatives; and determine other exposure values (e.g., selection of lens with appropriate focal length, arrangement of light sources, filter factors), considering the adjustments required because of the use of varying types of screens.

In comparison with the grade 9 level, offset photographers also must be skilled in applying a greater variety of methods including the creation of vignette effects; production of two halftone negatives, for opposite ends of the gray scale, from the same monochrome copy (for subsequent use in the production of two-color halftone, i.e., duotone, reproductions); and, in addition to the



use of dropout masks, preparing and using highlight overlay masks to increase highlight detail when required.

Responsibility: Grade 10 offset photographers perform their work independently on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. In comparison with the grade 9 level, offset photographers at this level must be familiar with more complex and extensive technical guides and procedures involved in accomplishing halftone photography. They are also responsible for more difficult judgments in determining and adapting the procedures and methods to be used because of the larger number of interacting variables (e.g., proper line and percentage of screen, tonal range of the copy, screen distances and angles) which must be considered in accomplishing halftone multicolor photography. Because of the greater sensitivity of halftone procedures to variations in exposure and development control, grade 10 offset photographers, in comparison with the grade 9 level, also are responsible for applying greater care in carrying out work procedures, for example, maintaining precise time and temperature controls during film development, and frequently using magnification or other aids such as dot percentage readers to control dot formation and image intensity.

Grade 10 offset photographers are responsible for meeting tolerance requirements concerning scale, dimensions, alignment registration, and line weight which range from hairline tolerances of plus or minus .003 inch to critical (e.g., plus or minus .001 inch) or finer tolerances. However, in addition to responsibility for assuring balanced exposure, proper density and image fidelity, and consistency of tone in the image area, as described at the grade 9 level, grade 10 offset photographers must meet critical requirements with respect to additional parameters such as dot size, density, and avoidance of unwanted halation (for example, requirements for hard core dots with density values of approximately 1.95 at the core, graduating to approximately .35 at the dot perimeter); faithful reproduction or enhancement, as required, of the tonal range of the original copy; precise percentage of screen tints; and color saturation and balance.

Completed work is checked for compliance with instructions, specification requirements, and trade practices.

Physical Effort: The physical effort required at this grade is the same as that described at [grade 7](#).

Working Conditions: The working conditions at this grade are the same as those described at [grade 7](#).



4414-11**OFFSET PHOTOGRAPHER, GRADE 11****4414-11**

General: Grade 11 offset photographers independently operate one or more process cameras and/or electronic color scanners, as well as other photographic equipment, to accomplish projects requiring the application of advanced or unconventional photographic methods and techniques to make negatives and positives, or other photographic products, required for the preparation of lithographic printing plates subsequently used in the multicolor reproduction of printed matter. The copy consists of a variety of multicolor tone reflection and/or transmission copy materials which contain areas of inconsistent tone or other deficiencies such as weak images or inadequate contrast. (Line and single-color materials may be included if they are photographed in combination with such multicolor tone copy.)

In comparison with the use and adaptation of standard halftone and nonprocess color separation methods and techniques as described at the grade 10 level, grade 11 offset photographers apply greater knowledge and skill in accomplishing photographic projects which require the use of advanced or unconventional techniques and methods such as simulating natural light conditions to produce highly controlled shadows on reproduction products; tone matching joined products or sets of products to exacting standards, using negatives made from different source materials with a variety of tones and contrasts; and making sets of balanced, color corrected separation negatives and positives using photographic process color separation and color correction methods and techniques and/or electronic color scanners.

Grade 11 offset photographers perform their work on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. As at the grade 10 level, grade 11 offset photographers must meet tolerance requirements with respect to scale and dimensions, alignment registration, and line weight ranging from hairline tolerances of plus or minus .003 inch to critical (e.g., plus or minus .001 inch) or finer tolerances, as well as critical quality standards concerning dot size and density, and other parameters such as faithful reproduction of the tonal range of the original copy, color balance, and contrast. However, in comparison with the grade 10 level, grade 11 offset photographers must meet additional and more difficult requirements such as maintaining uniform dot size over film areas consisting of joined products (e.g., within a dot size variance tolerance of plus or minus .0001 inch) or controlling tone variations between adjoining or overlapping products (e.g., plus or minus .05 D minimum; and plus or minus .10 D maximum).

Skill and Knowledge: In comparison with the use and adaptation of standard halftone and nonprocess color separation methods and techniques to photograph multicolor tone copy materials containing areas of inconsistent tone, or other deficiencies, as described at the grade 10 level, grade 11 offset photographers must apply greater skill and knowledge to accomplish photographic projects requiring the use of advanced or unconventional methods and techniques. Such projects are characterized by one or both of the following:



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- photography of multicolor tone or other copy materials of an unusually difficult or special nature, requiring the use of unconventional methods and/or the application of a very high degree of photographic skill and knowledge to meet exacting tolerance and other quality standards; and/or
- preparation of sets of balanced, color corrected process color separation negatives and positives of multicolor tone copy materials involving the use of process cameras and/or electronic color scanners, as well as other photographic equipment.

Typical of the first type of project (involving unusually difficult copy and the use of unconventional methods), and indicative of the skill and knowledge required at this level, is the photographic conversion of three-dimensional color models of portions of the earth's surface, complete in minute detail, to halftone imagery for subsequent reproduction. In accomplishing the project, the grade 11 offset photographer must apply skill and knowledge in evaluating the "copy" materials (i.e., the models); determining the methods, procedures, and techniques to be used; and exercising stringent exposure and processing control during all three stages of the project including photographic conversion of the "copy" (consisting of ten or more different models) to continuous tone negative form; conversion of the continuous tone negatives to positive images; and conversion of the positive images to halftone negative imagery. The grade 11 offset photographer, in comparison with the use of standard methods and techniques at the grade 10 level, also must apply greater skill in the use of unconventional lighting techniques to simulate natural light conditions. This includes precise placement of light sources, considering the degree of elevation depicted on the models, to assure that the resulting shadows and relief modeling are within exacting tolerance requirements concerning length and direction. Because of differences in the tonal portrayal among the models, the offset photographer at this level also must apply knowledge of the photographic techniques required to accomplish the tonal shifts needed to reconcile these differences.

In comparison with the use of nonprocess color separation methods and techniques, as described at the grade 10 level, grade 11 offset photographers must have greater skill and knowledge of photographic principles, methods, procedures, and techniques, and a thorough practical understanding of the additive and subtractive primary colors, and the process inks, to accomplish all stages of process color separation and to make sets of balanced, color corrected separation negatives and positives from full color tone copy. They accomplish the work using process cameras and other equipment, and/or operate electronic color scanners to perform parallel functions.

They apply skill and knowledge in evaluating copy; selecting the method of process color separation to be used (i.e., direct or indirect); determining the exposure settings (exposing test film as required); exposing copy using the standard tricolor filters (blue, green, red) to make the uncorrected yellow, magenta, cyan, and black printer separations; determining the masking system to be used (e.g., single stage, or two stage); preparing the color correcting photographic masks (including pre masks and principal masks, depending on the method used to correct the



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method used) as required to correct for the hue error and other deficiencies of the process inks, and to accomplish undercolor removal; and preparing the final screen color separation negatives or positives (in the process camera or a vacuum contact frame).

In accomplishing process color separation of full color tone copy, grade 11 offset photographers also must apply skill and knowledge in the selection and use of screens (e.g., magenta contact screens for making color separation negatives or positives by the indirect method, gray contact screens when the direct method of color separation is used); use of methods including color filters, controlled flash, controlled agitation during processing, and supplementing highlight exposures to control and adjust contrast in the different color separations; use of a gray scale exposed with the copy to check on tone separation in the highlight, middletone, and shadow areas of each negative; and use of solid and tint color control patches (closely matched or identical to the process inks and papers to be used in reproduction) to evaluate color separation products and to determine the required strengths of the color correcting masks.

In using electronic color scanning equipment to prepare process color separation products, grade 11 offset photographers must apply knowledge of photographic principles, and of the variables which must be considered and controlled, which is substantially similar to that required in accomplishing process color separation using a process camera. In addition, they must apply thorough knowledge of the extensive, detailed procedural guides applicable to the specific scanning equipment used so as to perform the required color separation and color correcting functions.

Responsibility: Grade 11 offset photographers perform their work independently on the basis of work orders, specifications, accepted photographic practices, established procedures, and verbal or written instructions from the supervisor. In comparison with the grade 10 level, offset photographers at this level must be thoroughly familiar with additional and more complex technical guides and manuals (for example, operating manuals and procedures for electronic color scanners) applicable to the advanced or unconventional photographic techniques used, process color separation and color correction, and/or the operation of color scanning equipment.

As at the grade 10 level, grade 11 offset photographers must meet tolerance requirements with respect to scale and dimensions, alignment registration, and line weight ranging from hairline tolerances of plus or minus .003 inch to critical (e.g., Plus or minus .001 inch) or finer tolerances. They must also meet critical quality standards concerning dot size, density, and avoidance of unwanted halation, as well as other parameters such as faithful reproduction or enhancement, as required, of the tonal range of the copy, contrast, precise percentage of screen tints, and color saturation and balance. However, in comparison with the grade 10 level, grade 11 offset photographers are responsible for meeting additional and more difficult quality standards in accomplishing complete photographic projects (including all intermediate stages). For example, depending on the nature of the project involved, offset photographers at this level are responsible for assuring matched dot portrayal along the sides of adjoining or overlapping products, and maintaining uniform dot size over film consisting of joined products within a dot size variance



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tolerance of plus or minus .0001 inch. Also typical of requirements at this level is responsibility for controlling tone variations between adjoining overlapping products so as to retain the tonal character and detail of interior images while maintaining the continuity of overlap densities from product to product. Similarly, in making sets of balanced, color corrected process color separation negatives and positives, grade 11 offset photographers are responsible for all phases of the project including evaluation of copy, determination of camera settings for use in conjunction with tricolor filters to record primary colors, determination of color correction requirements using color control patches, application of photographic masking techniques to perform color correction and under-color removal, and/or performance of parallel functions through appropriate control settings and operation of color scanning equipment.

Completed work is checked for compliance with instructions, specification requirements, and trade practices.

Physical Effort: The physical effort required at this grade is the same as that described at [grade 7](#).

Working Conditions: The working conditions at this grade are the same as those described at [grade 7](#).

