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DEPARTMENT ADMINISTRATIVE ORDER
No. 2004-23

SUBJECT: **Guidelines for the Computerization of Land Records**

Pursuant to the provisions of Republic Act. No. 8792, otherwise known as the Electronic Commerce (E-Commerce) Act of 2000, particularly Part IV, and to institute improvements in the records management functions of the Department, initially by digital imaging of existing land records, this Order is hereby issued for the guidance of all concerned.

Section 1
Objectives

This Order aims to ensure proper management of public records to comply with operational, legal/regulatory, fiscal, archival and other requirements and for efficient storage and retrieval of land records, establishing system that increases accountability and further safeguard document security and access for present and future use.

Section 2
Coverage

The guidelines prescribed in this Order shall cover all approved land records and approved public land applications for archiving – from document preparation, classification of documents for retention purposes, and digitizing and indexing.

Section 3
Definition of Terms

For purposes of this Order, key terms are defined as follows:

Land Surveys Unit – an office under the Land Management Office, DENR Regional Offices;

Document Imaging - the process of storing images on a computer, particularly bit-mapped images; using scanning machines and other capture imaging equipment;

Scanner/Optical Scanner – a device that can read text or illustrations printed on paper and translate the information into a form the computer can use. A scanner works by digitizing an image – dividing it into a grid of boxes and representing each box with

either a zero or a one, depending on whether the box is filled in; each box is represented by up to 24-bits, the resulting matrix of bits, called a bit-map can then be stored in a file, displayed on a screen and manipulated by programs;

Camera/Digital Camera - stores images digitally rather than recording them on film. Once a picture has been taken, it can be downloaded to a computer system, and then manipulated with a graphics program and printed.

Section 4
Procedures

Procedures prescribed herein include (with corresponding Section number as indicated):

4.1 Preparing Land Records for Digitizing
4.2 Records Validation
4.3 Records Digitization and Indexing
- 4.3.1 Digital Image Files Types
- 4.3.2 Image Capture
- 4.3.3 Quality Requirements for Digital Images
- 4.3.4 Image Optimization/Editing
- 4.3.5 Records Indexing

4.1 Preparing Land Survey Records for Digitizing

Generally, all survey records which passed the regular process and verification and deemed approved, and when finally transmitted to the Survey Records Section, Land Management Division which are found to be authentic, shall be subjected to digitization.

4.1.1 The Chief Surveys Division and Land Management Division, to be assisted by the respective records clerk or custodian, shall conduct inventory and classify land records obtained by or in custody of the respective records custodian. Original documents shall be authenticated vis-à-vis, with that of photocopies or duplicates;

4.1.2 For all land application records, CENROs / PENROs shall submit a report or copies of all approved land titles (which are still in their possession) numerically (following the judicial form no.) and indicating the recommending/approving authority at the time the land title was approved and countercheck records vis-à-vis the land decree (for decreed properties) and original certificate of title (for titles acquired judicially or administratively) for inclusion in the inventory.

4.2 Records Preparation and Validation

- All survey records and approved administered land titles inventoried and classified to be authentic should be consolidated by province/ town/ barangay and arranged alphabetically (per titlee) or numerically (per judicial form number series or land title number series). First priority shall be given to records approved from January 2000 onwards. Said documents should undergo the following validation checks:

  a. Check the authenticity of signatures of recommending/ approving authority vis-à-vis their specimen signature and period when they are authorized to sign or approve lot data computation, lot survey plan and the land title. There are instances when some survey plans found their way to be approved even if it has not undergone the usual process which could make them spurious. Some are found to be counterfeit when they bear "faked" signatures of the approving and recommending officials or contain signatures of approving/ recommending officials who have actually retired or have been transferred to another office;

  b. Check the judicial form number series appearing on the document if it corresponds with those assigned to the recommending/approving authority within the specified period;

  c. The date of approval appearing on the approved title, the title number or the judicial number should be double-checked for any discrepancies on both the number series and the date for comparison with the tenure of the approving/recommending authority;

  d. Check if the correct survey symbols/survey number were applied and indicated in the survey plan;

For survey records:

  e. Check the plan if it bears the initials of the verifiers, Chief, Projection Section and the project person, the Chief of Section concerned and the Chief of Surveys Division.

  f. Check survey envelope if the basic supporting documents (may vary according to type of survey approved) are in order:

     1. Survey authority signed by the CENRO or Regional Technical Director;
     2. Certification as to whether alienable or disposable,
     3. Geodetic engineer's certificate duly signed,

4. Survey applicants' proof of ownership such as tax declaration or Barangay Captain declaration or affidavit of adjoining owners / claimants,
5. Lot description or lot data computation if the lot description is not inscribed on plan.
6. List of lot claimants (both alphabetical and numerical)
7. Technical Description
8. Approved Cadastral maps
9. Copy of LRC approved plan, if previously approved by LRA
10. Certified copy of title

- Once the records have passed scrutiny and found to be in order, respective land management Division Chiefs and records clerk or custodian will stamp "PASSED FOR DIGITAL IMAGING", affix his/her signature on the records evaluated and checked to be countersigned by the Chief, Surveys Division.

- The same will be forwarded to trained records personnel (of the Land Surveys Unit records personnel) for digitizing (follow guidelines as described in 'Records Digitization and Indexing Section).

- All survey plans digitized should be marked with an access no.

For documents found not to have passed with at least one of the above criteria, the same shall be set aside for further checking and verification by the Chief, Surveys Unit, Land Management Division, Regional Offices through the following:

1. Check with the transmittal from the approving office (Bureau of Lands or Regional Technical Director);
2. Verify with the projection section as to the correctness of plotting, if projected;
3. Verify further the signatures from the specimen signatures of signing officials in other plans or approved specimen signatures;
4. If after proper verification with the above process, the result is still negative, the survey plan should be forwarded to the Chief, Surveys Unit, Land Management Division for further scrutiny before it can be included or considered for digitizing;

These original surveys bear the following symbols:

Psu	Private Surveys	Msi	Miscellaneous Sales (individual)
Csd	Subdivision of Undecreed Property	F	Free Patent
Ccn	Consolidation of Undecreed Property	Tsi	Townsite Reservation Subdivision (individual)
Ccs	Consolidation / Subdivision of Decreed Property	H	Homestead
Fli	Foreshore Lease (individual)	Sgs	Segregation Survey
Flc	Foreshore Lease (corporation)	Gss	Group Settlement Surveys

Fls	Friar Lands subdivision	SWO	Special Work Order
As	Advance Survey	Cad	Cadastral Survey
Ap	Advance Plan	Mcc	Miscellaneous Sales (Corporation/Institution)
Ac	Agricultural Colony	Tsc	Townsite Reservation Subdivision (Corporation)
Rl	Reclaimed lands	Li	Lease Application (individual)
Rs	Resurveys	Pls	Public Land Subdivision
SI	Sales application (individual)	Fis	Fishpond Lease Application
Sc	Sales application (corporation)		
Ng	National Government Cad.	Lc	Lease Application (Corporation)
Tb	Townsite Reservation Boundary	Mli	Miscellaneous lease application (individual)
Ts	Townsite Reservation Subdiv.	Mlc	Miscellaneous lease application (corporation)
Pld	Public Land Delimitation	Nr	National Reservation
Mr	Municipal reservation	Pr	Provincial reservation

4.3 Records Digitization and Indexing

The following sections describe these procedures/guidelines for digital imaging:

4.3.1 Digital Image Files Types

There are three major types of digital imaging files expected to be created for land records: archived documents, active documents and thumbnails.

- **Archived** documents are the digital master copy of original documents. The same should be saved in *uncompressed TIFF file* format, and should not be compressed, altered or resized. Master files should be stored on a stable storage medium and should remain in a secure controlled environment.

- **Active** documents are those that are subject to comments, review and may be electronically modified or annotated. They may be converted to other digital formats (e.g., PDF, Microsoft Word, HTML) and used for printing. Active documents must be of good quality, but they may be modified as needed.

- **Thumbnail** files are for use in databases or web pages used as links for previewing archived or active documents.

4.3.2 Image Capture

The image capture process can be undertaken either by digitizing direct from the original or by digitizing a certified true copy image, such as a

photocopy, blueprint, transparency or print of that original. The capture device can either be in the form of a "scanner" designed to capture two-dimensional records or a "camera" which will be set up to work with either two-dimensional or three-dimensional originals.

4.3.2.1 Preparatory Activities to Image Capture

a. Equipment, Software and Environment

All equipment should be tested and calibrated. The digital imaging room/work area should be prepared with consistent controlled lighting and the digitization team trained in the use of all capture equipment and software within an established and standardized workflow.

b. Development and continuous refinement of Operational Manual for Image Capture

Before any image capture can be undertaken, the operators must know the required file sizes and file types. Once theses have been established they will become part of the Operational Manual. These should be established and agreed upon before the onset of the project.

c. Establish Capture Workflow

All tasks within the capture workflow should be documented and a manual of 'Good Practice' in digital imaging established to guide all operators.

d. Use of two-image color management systems

'Objective' Capture – In an objective capture workflow, the color of the digital images can be objectively measured and compared against the original work. This is normal within a 'Direct Digital Capture' workflow where there has not been any intermediary image. This is a typical capture workflow when working with a digital camera or when scanning direct from the original.

An objective capture workflow should be calibrated and characterized using the ICC profiling system and then operator color adjustment prevented.

'Subjective' Capture – In a subjective capture workflow the color of the digital image can only be compared against another 'analogue intermediary' image (often a copy transparency of the original). As this analogue intermediary has already introduced a subjective element to the digital image, it will be necessary to allow the operator to make color adjustments according to his skill and understanding of the original image to correct any possible fault within the 'analogue intermediary'.

This 'subjective' workflow is typical of any system that is working with some form of copy of the original.

e. Collect and prepare original images

The Records Custodian must determine the state or sort out documents that are fragile (requiring special handling). Start scanning documents in good condition.

f. Clean original documents

The records custodian shall determine and perform the appropriate method of preparing the originals for imaging. It is more efficient to start with clean original documents than to digitally clean the document image.

g. Clean image capture device

Scanners, cameras and other input device must be kept scrupulously clean. All capture equipment should be externally cleaned every day and internally cleaned as required, which is normally at least each week. All cleaning should be done in strict accordance with the manufacturer's recommendations.

4.3.2.2 Image Capture

a. Capture at the highest quality color settings that the image capture device is capable of producing.
Capture at the full color depth offered by the capture device. This should be at least 24-bit (8bit per channel) at present technology.

While this method will be slower, uses more memory and will increase storage requirements, the archive image will then have been stored at the best possible quality from the device allowing re-use.

b. Capture at the highest resolution necessary for your uses (or larger than your current needs).

c. Record the metadata

Collect as much administrative metadata (technical file details as possible and that is entered as close to the time of creation as possible. This should either be done automatically within software or manually by the operator at the time of capture.

d. Visually check each and every image

Every image should be given a visual check for any obvious faults, re-capturing at time of creation is easier and less time consuming than having to return to the original at a later date.

e. Once image is captured – save it

Save the image within a 'standard' open uncompressed file-format. This is normally TIFF. The image-file should be saved with a unique name following a standardized name structure that provides enough information to locate the original image.

Source: Technical Advisory Service for Images: Advice, Managing Digitization Projects, UK

4.3.2.3 Quality Requirements for Digital Images

These requirements should be viewed as the minimum necessary to create quality digital images of land records. Any technology employed – combination of hardware, software and/or packaged solution -- must meet if not exceed these basic requirements:

Image Type	Printed Text	Damaged Printed Text	Handwritten text / Annotations	Maps, Drawings
Archived Document	Scan Type: Bitonal	Scan Type: 8-bit grayscale or 24-bit color	Scan Type: 8-bit grayscale or 24-bit color	Scan Type: 8-bit grayscale or 24-bit color
	Resolution: 600 DPI	Resolution: 400 DPI	Resolution: 600 DPI	Resolution: 200-400 DPI
	Format: Uncompressed TIFF	Format: Uncompressed TIFF	Format: Uncompressed TIFF	Format: Uncompressed TIFF
Active Documents	Scan Type: 8-bit grayscale or 24-bit color	Scan Type: 8-bit grayscale or 24-bit color	Scan Type: 8-bit grayscale or 24-bit color	Scan Type: 8-bit grayscale or 24-bit color
	Format: JPEG Compression: Medium	Format: JPEG Compression: Medium	Format: JPEG Compression: Medium	Format: JPEG Compression: Medium
	Spatial Resolution: Resize to 1024 x 768 pixels	Spatial Resolution: Resize to 1024 x 768 pixels	Spatial Resolution: Resize to 1024 x 768 pixels	Spatial Resolution: Resize to 1200 pixels across the long dimension (large maps) size to 640 x 480 pixels (small maps)
Thumbnail	4-bit grayscale / 8-bit color	4-bit grayscale / 8-bit color	4-bit grayscale / 8-bit color	4-bit grayscale / 8-bit color
	Format: GIF	Format: GIF	Format: GIF (or JPEG)	Format: GIF (or JPEG)
	Spatial Resolution: Resize to 150-200 pixels across the long dimension 72 DPI	Spatial Resolution: Resize to 150-200 pixels across the long dimension 72 DPI	Spatial Resolution: Resize to 150-200 pixels across the long dimension 72 DPI	Spatial Resolution: Resize to 150-200 pixels across the long dimension

Image Type	Printed Text	Damaged Printed Text	Handwritten text / Annotations	Maps, Drawings
				72 DPI

Source: Guidelines for Digital Imaging Projects, Digital Imaging and Media Technology Initiative, University Library, University of Illinois at Urbana-Champaign, December 6, 2001

4.3.2.4 Image Optimization/Editing

Once the image has been captured by the input device via scanner or camera and saved as a master archive file, it is necessary to optimize the image-file to prepare it for its intended use. This optimization can be considered in two parts; an initial generic or basic optimization is made to all files and then a further specific optimization that creates the substitute image more suited for specific use such as 'web publishing' or printing.

Basic Optimization. The procedure to perform the following tasks will depend on the chosen imaging software. However, all stages described here are all generic and will be applicable in all common imaging programs.

i. Create a working copy

Create a working copy of the image from the maser archive file, then, if for any reason things go wrong, the master archive image is intact. This file should be named in such a way as to both connect it to the original and also indicate that it is a new working copy of the original image.

ii. Crop if necessary

Check the size, shape and orientation of image and adjust if needed.

iii. Optimize density range

Use levels tools (or its functional equivalent) of the imaging software to adjust shadow and highlight points to best use the whole range of available tones within original image.

iv. Check and correct any fault in the color of image file

Use curves tool (or its functional equivalent) of the imaging software to adjust and modify the color balance within each separate channel.

v. Check image for any defects

Inspect all images for any marks or dust. If it is easy to fix these within software, then it should be done. If not, then the image should be considered to have failed the quality assurance and should be marked for subsequent re-capture.

vi. Apply sharpening if necessary

It is best practice to add no sharpening at this point, however some scanners have an inherent softening effect on the images and it can be necessary to apply some small element of *Unsharp Masking*. This should be limited to only very slight work that repairs image than alters the image substantially.

vii. Save any editing work often

Some image editors have a limited undo capability (often just the last operation). Others keep a 'history' of operations that can be selectively deleted or changed, however remember that the number of 'history' levels will quickly expand the file size and therefore memory requirements.

4.3.2.5 Further Specific Optimization/Editing

After the image has undergone basic optimization it will be necessary to undertake further optimization specific to the required use of the image.

a. Save again; save often

It is best practice to again save the image at this point under a new filename so you have both the original 'master-archive' image and an 'adjusted-master' image for later use. Both file names should be unique but must allow authorized users to associate both files.

b. Resize

Any images should be made by re-sizing direct from the 'Adjusted-Master' archive image. Any resizing must make images smaller rather than larger.

c. Sharpen Image

If necessary, re-apply any sharpening between the re-sizing and any compression made to the image. Sharpening should be undertaken with great caution. It is imperative that image is not over sharpened and done (only to remedy rather than alter the image).

d. Save image (within appropriate file-format)

Choose the appropriate file-type for the proposed use. This is likely to be either TIFF (for print or archive) or JPEG (for on-screen initial browsing or web publishing).

e. Naming File

Save the file using a consistent naming convention that enables you to identify both the original file and the adjusted file.

4.3.2.6 Records Indexing

Data about each digital land survey record (or the record 'metadata') must be catalogued or indexed to facilitate search and retrieval. Such metadata must be in electronic form and must provide basic information about the record including, among others, its unique identifier, format, access restrictions.

In the absence of a formal standard, the record catalog shall at the minimum conform to the standards known as Dublin Core.

Indexing digitized records shall be done in any of the following ways:

a. Metadata information is entered by the scanner operator during scanning. The index so created is linked to the digital image object via its digital address in the storage medium.
b. Records are scanned or filmed to create an intermediate database of images. Then an operator displays each object on

the screen while entering index information. The index is later integrated or linked to the object database to establish links to the physical image location.

c. Indexing may be accomplished using desktop personal computers equipped with graphical viewing capabilities. The images will be presented to indexing staff for assignment of index values. These values are temporarily stored on the PC via a software using the standard metadata schema.

Section 5
Information Access and Security

A formal procedure must be in place to define the type of access to land records by officials and personnel, both on paper and digital form. Such a procedure must indicate, among others and for each type of record or transaction, whether a user may create, read, update or delete records and metadata. Tables or matrices to this effect must be created.

In the case of digital records, the information and communication system to be used must be capable of programmatically controlling access to such records based on the assigned access rights. These include ensuring that the records are easily usable and accessible, and also managing the way the resource or data is used, though **user registration** and **authentication** and **security.**

5.1 User Registration

User registration is important for management to know who is using the archive. This information can be used both as a security measure for the archive and also to offer additional functionality. Initially the user will be offered to view some content from the image archive before he/she is required to register (for example, thumbnails) but only provided the full functionality (and higher quality image) once the user has registered. During the user registration process, the user should be made aware of, and assumes agreement to certain rules and regulations governing access. Being aware of the agency's policies and regulations, the user is then bound by them.

5.2 Authentication

Three commonly used methods for user authentication and restricting access to digital records may be employed to secure hardware and software used in land records managements:

a. *Passwords* – assigning a unique username and a strong password shall be the absolute minimum authentication method used;

b. *IP filtering* – in this technique, when access is required, the server checks (pattern matches) the IP address of the client computer sot that only authorized users may gain access;

c. *Passwords and IP filtering* is preferred, providing protection of a double layer of user authentication; not only must the user provide a username and password, but the IP address of the computer he/she is using is validated as well.

5.3 Security

Digitized image archive should be made as safe as possible from a variety of threats from unauthorized users and hackers.

For maximum security, the following should be undertaken:

- The archive should be hosted on a machine that can be accessed only by 'authorized 'personnel;
- A limited 'lockout' time typing in the password must be used, either separately or in conjunction with the limitation on login attempts to discourage the unauthorized or malicious user of the image archive;
- Servers should be set so that the last login name is not displayed, thereby preventing hackers from taking an educated guess at the password or gaining access by watching a user type in their password;
- The login names and passwords of standard accounts such as system administrator shall be changed upon initial configuration. Guest accounts should be disabled. In addition, the administrator user account name should be changed to a non-obvious name;
- Regularly change passwords. This can be implemented on either the number of logins or on a time period, for example, 3 months. The server should store a history list (or *audit trail*) of users and their previous passwords so that the user cannot alternate between current and old passwords, presenting further opportunities for unauthorized or hacker access. A 'grace' period should be built into the system, so that that user knows that a password change must be implemented within a predefined number of logins.

Section 6
Maintenance of Digital Files

The long-term maintenance and preservation of digital records files is a major concern that must be addressed early on. Support systems and mechanisms must be in place to retain the ability to display, retrieve and use digital records. Digital files must be cared for, periodically refreshed, and migrated to new formats. The following are simple practices that will help ensure the long-term preservation and continued access to digital records:

a. Establishment of digital repository for land records at the DENR Central Office and Regional Offices that is secured and with controlled access;

b. Key Preservation Principles

1. Store and handle digital media with care. Once having burnt and checked an archive storage media, it should go directly into a secured storage facility and stay there. When it becomes necessary to access digital land records information, it should be copied straight onto another 'working copy' of the disc then put straight back into the archive. On no account should the archive disc ever be used for day-to-day use nor leave the secured storage facility.

2. Develop formal preservation strategies and best practices and implement immediately.

   While CD-R has, over the last few years, been the de facto choice for preservation, DVD-R is fast becoming a preferable alternative. Emerging storage technologies must be identified to prepare for future migration.

3. Hard copy, paper prints, microfilm files must be created as backup to digital files

c. Storage Requirements for Digital Files

1. Store master images on high quality, industry standard digital tape, magnetic disks, or CD-R. (Gold colored CD-R's are of much better quality than silver).
2. CD-R's should only be labeled with archival quality adhesive labels and not with markers.
3. Create backups of the master files and store them off-site in a secure location. It is recommended that three backup copies be kept of each file in different locations, the exact site(s) of which shall be subject to the Secretary's approval.
4. Store media in a controlled environment. The accepted ranges for temperature are from 62-68 degrees (65 degrees is optimum) and relative

humidity should be within a 35-45% range with 40% optimum. Records storage area and work space must have provisions to keep consistent temperature and humidity. The storage area should not be prone to sudden changes in temperature or humidity.

5. Store all media away from strong magnetic fields.
6. Maintain a clean, dust-free environment.
7. Minimize the handling of master images and the media on which they are stored.
8. Digital files maintained for an extended period should be refreshed periodically by placing them onto new media. Follow the recommendations of the manufacturer.
9. Develop a system to periodically determine the readability of digital files. Follow a verification procedure such as checksum to ensure the integrity of the data after the refreshing process is complete.

Section 7
Hardware and Software

The digitization process requires both hardware and software. The choice of hardware will depend on the nature of the source material and the intended quality of capture. The choice of software should take into account what image processing operations are required and how the images will be delivered to the user.

a. Hardware

Commonly used digital capture devices fall into two general types: scanners and cameras.

For the purpose of land records digitizing, flatbed scanners will be used as these are easy to operate and high quality alternative at a price affordable (to be complemented with the use of digital camera, for hard to handle or fragile records).

For hard to handle documents or fragile records such as those survey records which were prepared way back in the 1900s, the use of digital cameras is recommended where flatbed scanning is impractical or might cause damage to the original material.

b. Software

Digitization software needed falls broadly into three types: image capture software, image editing software, and document management systems. These are available as stand-alone products or part of a purchase solution.

Section 7
Legal Basis

In general, any information and communications systems, technologies, procedures and policies to be employed in digitizing land records must ensure compliance to the requirements of Republic Act No. 8792 otherwise known as the Electronic Commerce Act of 2000 particularly Part IV, Section 27 on the Government Use of Electronic Data Messages, Electronic Documents and Electronic Signatures, to wit:

> "Notwithstanding any law to the contrary, within two (2) years from the date of effectivity of this Act, all departments, bureaus, offices and agencies of the government, as well as all government-owned and controlled corporations, that pursuant to law require or accept the filing of documents, require that documents be created, or retained and/or submitted, issue permits, licenses or certificates of registration or approval, or provide for the method and manner of payment or settlement of fees and other obligations to the government, shall-
>
> a) accept the creation, filing or retention of such documents in the form of electronic data messages or electronic documents;
> b) issue permits, licenses, or approval in the form of electronic data messages or electronic documents;
> c) require and/or accept payments, and issue receipts acknowledging such payments, through systems using electronic data messages or electronic documents; or
> d) transact the government business and/or perform governmental functions using electronic data messages or electronic documents, and for the purpose, are authorized to adopt and promulgate, after appropriate public hearing and with due publication in newspapers of general circulation, the appropriate rules, regulations, or guidelines, to, among others, specify –
>
> 1) the manner and format in which such electronic data messages or electronic documents shall be filed, created, and retained or issued;
> 2) where and when such electronic data messages or electronic documents have to be signed, the use of a electronic signature, the type of electronic signature required;
> 3) the format of an electronic data message or electronic document and the manner the electronic signature shall be affixed to the electronic data message or electronic documents;
> 4) the control processes and procedures as appropriate to ensure adequate integrity, security and confidentiality of electronic data messages or electronic documents or records or payments;
> 5) other attributes required or electronic data messages or electronic documents or payments, and
> 6) the full or limited use of the documents and papers for compliance with the government requirements: Provided, That is Act shall by itself mandate any department of the government, organ of state or statutory corporation to accept or issue any document in the form of electronic data messages r electronic documents upon the adoption, promulgation and publication of the appropriate rules, regulations, or guidelines."

Section 8
Institutionalizaton

Parallel to establishing procedures, acquiring technologies and IT facilities, capacity building activities must be implemented at all levels to ensure that land management and records management staff are capable of handling digital land records.

8.1 Prerequisite Activities

The following activities shall be performed:

8.1.1 Updating of LMS and records management personnel profiles;
8.1.2 Conduct job analysis of LMS and records management;
8.1.3 Conduct training needs assessment of present work force;

The results of the job analysis shall be used to prepare the desired job description for LMS positions with the end of incorporating records management in the personnel duties and functions (PDF). The same shall be the basis for establishing relevant indicators and mechanisms to institutionalize records management in the Agency Work and Financial Plan.

Corollary to this, collaborative efforts among the various sectors must be done to establish a centralized records system (CRS) at the Regional Office. In this case, the E-Records TWG shall provide technical assistance. The details of the proposed CRS shall be provided by the Chief, Administrative Division.

8.2 Training Programs

Knowledge and capacities of LMS and records management personnel must be developed in the following areas:

8.2.1 *Electronic Records management* – to enable records officers to acquire better and broader understanding of electronic document management methods and to master the basics of prescribed procedures and best practices in the proper and systematic handling of electronic records
8.2.2 *Computer literacy training* shall provide a solid foundation on the use of computers and business software
8.2.3 *Geographic Information Systems* – designed to develop capability in generating digital maps, map appreciation and analysis. Such skills on the handling of digital maps are particularly relevant since applicants and their representative engineers are increasingly submitting maps in digital format.

8.2.4 *Computer-Aided Drawing (CAD)* – designed to enhance skills of cartographers and mathematicians / verifiers on map projection, plotting, computation, and verification.

8.2.5 *Values Formation* – with focus on RA 6713 or the Standard Norms of Conduct for Government Officials and Employees.

Section 9
Effectivity

This Order takes effect immediately and revokes, supersedes and amends any order and/or instructions inconsistent herewith.

ELISEA (BEBET) G. GOZUN
Secretary