

MAGNETIC MEDIA OPERATIONS AND SECURITY

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1. GENERAL

- 1.01 This guideline has been developed to provide Southwestern Bell Telephone Company computer facilities with procedures for developing and maintaining well-run operations with high levels of security.
- 1.02 This guideline contains procedures designed to control processing, input/output (I/O) activities, and media handling.
- 1.03 With the implementation of 3480 tape technology, many aspects of tape processing have changed. The SWBT Standards document, SW 750-312-900, has been revised to document procedures and guidelines for the ongoing use of 3480 media.

Many of the guidelines are relevant for both 3420 and 3480 media. Others have been deleted or added depending on their impact to daily tape operations.

If there are any questions regarding the updates, or if further explanation is needed, please contact Gregg Stockmann on (314) 235-0452.

Note: Whenever this guideline is reissued, the reason(s) will be listed in this paragraph.

- 1.04 These procedures are designed to encompass all offices that process magnetic media (tape, disk, mass storage, etc.). This includes word processing systems, minicomputer systems, microcomputer systems, etc. It does not include telephone switching systems. However, computers which are used to support the switching system (i.e., operational support systems) are included.

A. Definitions

- 1.05 The term "AMA tape management area" will be used in this practice to represent the unit or center designated for AMA tape handling.
- 1.06 Magnetic Media Storage Facility (Tape Library) - The area designated for normal storage of all magnetic media. This area should be located in close proximity to the computer facility or located within the computer facility, much like 3480 cartridge libraries. The computer facility must be constructed in compliance with the standards established for data processing facilities and BSP Section 007-590-303.

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- 1.07 Magnetic Media - Any magnetic medium used to accumulate company data. This includes magnetic tape, floppy disk, disk, diskettes, mass storage, drum, etc.
- 1.08 Computer Facility - Any area housing equipment used to create or process magnetic media. This includes offices using word processing equipment, minicomputers, microcomputers, maxicomputers, microfloppy computers, or any of the elements identified in BSP Section 007-590-301 as elements of the processing environment.
2. COMPUTER FACILITY SECURITY ADMINISTRATION
- 2.01 A computer security administrator should be named to monitor all computer facility security functions.
- 2.02 Depending on the administrative setup of the computer facility, the duties of the administrator should include the following:
- o Monitoring physical security of the computer facility.
 - o Conducting physical security and contingency preparedness tests, drills, and training, or coordinating with appropriate person(s) who execute these functions to ensure that these functions are performed on time.
 - o Conducting periodic tests of the detection and alarm systems or coordinating with the appropriate person(s) who conduct these tests to ensure that these tests are conducted on time.
 - o Having access to, and maintaining familiarity with, current practices related to computer security.
- 2.03 Computer facility personnel should be trained in concepts, controls, computer operations, magnetic media handling techniques, disaster recovery procedures, and security procedures.
- 2.04 Computer facility personnel should be encouraged to discuss their feelings about their job, their working conditions, and the Company, with their immediate supervisor.
- 2.05 Regular performance appraisals should be given and discussed with employees.

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- 2.06 Supervisors should be conscious of the possibility of the disgruntled employee.
- 2.07 Personnel duties should be rotated to avoid creating indispensable personnel.

3. MAGNETIC MEDIA CONTROLS

3.01 The information contained on magnetic tape and disk is just as much an asset as computer hardware. The demand for this information is increasing as competition within the telecommunication industry increases. The procedures outlined in this section are applicable to all hardware devices and configurations; i.e. CADE, CRPS, minicomputers, microcomputers, satellite offices, etc.

A. Special Consideration For Magnetic Tape

- 3.02 Magnetic tapes are susceptible to damage and contamination, often resulting in loss of data. The reproduction of this data is time-consuming, expensive, and sometimes impossible to achieve. To avoid tape damage and loss of data, the following precautions are recommended.
- 3.03 Canisters, if used, should not be stored lying flat in stacks because there is a possibility of crushing or distorting the bottom container from the excessive weight of the stack. The excessive weight may also cause edge damage to the tape itself.
- 3.04 The above rule also applies to the tape handling and storage of wraparound tape-seal belts, E-Z load cartridges, and 3480 cartridges. Whenever possible, media should not be stacked. If there is a necessity to stack due to space constraints, reel media should be stacked no more than 10 high and cartridge media no more than 6 high.
- 3.05 Reassemble the canister even when empty to prevent the accumulation of any contaminants.
- 3.06 Canisters, tape-seal belts, and E-Z load cartridges, should be cleaned periodically with a soft, lint free cloth or paper towel to remove any buildup of dust. If a mechanical cleaning device is available, then it can be used for this purpose.

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The 3480 cartridges should also be inspected for debris on the cartridge. Use a lint free cloth to clean the surface so contaminants do not enter the cartridge.

- 3.07 Reels of tape should be handled by the hub, which is the strongest, most stable part of the reel. Force should not be exerted on the flanges, especially when mounting the tape. If the flanges are forced against the tape, irreparable physical damage (edge damage) could occur.
- 3.08 When mounting the tape, it is best not to excessively touch the tape. Fingerprints form excellent holding areas for dust and lint. They also leave oil/moisture on the tape increasing the opportunity for error.
- 3.09 Tapes should not touch the floor. This action will transfer contaminants to the tape. The tape in turn could contaminate the tape drive, which could transfer contaminants to other tapes.
- 3.10 The 3420 type devices should be cleaned frequently. Normal cleaning entails the device to be thoroughly cleaned during the first and second session of each shift to avoid long intervals of unclean tape devices. Prudent judgement should be exercised. If a tape drive load is extremely light during a work shift, then it might be wasteful to clean the tape drive in that instance. When cleaning the tape drive, all elements of the tape path on the drive should be wiped with vendor supplied cleaning solvent, with special attention to the read/write heads.

Procedures to clean 3420 devices should include cleaning the read/write heads first followed by the capstan wheel and tape path. Cleaning should also be performed on the tape drive hub to prevent tape slippage causing Z-folds in the tape. If deemed necessary, vacuuming the drives once per week will decrease the dust and other contaminants affecting drive and media performance.

The 3480 tape devices should be cleaned a minimum of once per week with the supplied cleaning cartridge. It is advisable to have the local 3480 hardware vendor, wet-clean the read/write head once per week. Cleaning requirements should increase if temporary errors are not declining.

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- 3.11 Incoming tapes should be allowed to reach temperature equilibrium before use. The time required for a tape to stabilize varies with the temperature differential between the outside and the computer room, but most tape manufacturers recommend 24 hours. If an extreme temperature differential exists and tapes are mounted prior to stabilization, then they may become physically distorted.
- 3.12 Food, tobacco, beverages, and other liquids are prohibited in the computer facility. There are NO EXCEPTIONS due to the critical nature of the data processed and stored.

B. Special Consideration For Transportable Disk Packs

- 3.13 Since most disk packs are fixed non-removable, this section applies only to those disk packs which can be moved or transported.
- 3.14 Disk packs are precision devices that require careful handling procedures to ensure data integrity.
- 3.15 Disk packs should be stored on individual shelves.
- 3.16 Disk packs should be stored with the bottom cover intact. This prevents contaminants from reaching the pack surface and eliminates damage to the sector disk and subsequent damage to the bottom recording disk.
- 3.17 Uncrated disk packs should never be stacked.
- 3.18 Manufacturers recommend returning the disk pack to its original shipping container for long-term storage, if possible.
- 3.19 The disk pack top and bottom protective covers should be reassembled. This should be done even when a disk pack is not contained in the cover, so dust and dirt do not accumulate inside.
- 3.20 The protective covers should be cleaned periodically in order to remove dust buildup.
- 3.21 Cracked, distorted, or otherwise damaged covers should be replaced.

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- 3.22 Hands, writing instruments, and other objects should be kept off the disk surfaces. These surfaces can be distorted or damaged through impact, excessive pressure, or abrasion. Should a disk pack be suspected of damage, it should be inspected by a Customer Engineer before any attempt is made to use it.
- 3.23 The disk pack should not be impeded from turning, by pressing on the top disk. This can be dangerous. In addition, it can damage the disk.
- 3.24 The disk pack should never be moved to another drive after a head crash. In addition, a disk pack suspected of damage should never be mounted. Either of these events will probably damage the drive and other packs. A Customer Engineer should be called to check both the drive and the disk pack.
- 3.25 Coffee or other beverages spilled on the disk pack or on disk pack covers might require that the pack be reconditioned. Thus all beverages should be kept out of the computer room; and other liquids, such as cleaning fluid, should be kept off the disk drives.
- 3.26 Ashes and tobacco can cause disk pack contamination. Therefore, tobacco and smoking accessories should be kept out of the computer room.
- 3.27 With regard to transportable disk drives with air filters, these filters should be replaced at least once a year when operated in a normal environment. The filter should be cleaned periodically.

C. Special Consideration For Mass Storage Cartridges

- 3.28 Mass Storage Cartridges should be treated with the same respect, and provided the same environmental conditions, as magnetic tape and disk.
- 3.29 Mass Storage Cartridges should not be removed and transported for storage or for use in other locations. The cartridges might loosen during transportation, causing errors and difficulty in loading when remounted.

D. Special Consideration For Floppy Diskettes

- 3.30 Floppy diskettes are susceptible to damage and contamination often resulting in the loss of valuable data. For this reason, particular attention should be given to the protection of this form of magnetic media.

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Virtually, every microcomputer has at least one floppy disk drive. Flexible diskettes are the primary means for distributing software and data, and the handling of diskettes is an integral part of using microcomputers.

The actual magnetic disk resides within a protective jacket. There are openings in the jacket for access by the read/write heads of the drive mechanism. These surfaces are particularly vulnerable to damage.

3.31 Floppy diskettes may become unreliable if they are not cared for properly. Once data on a diskette has been lost through careless handling, it is generally unrecoverable. To avoid damage to diskettes and loss of data, the following precautions are recommended:

- o Never touch the exposed surface of the diskette. Scratches and dust attracted by natural oils from your fingers can ruin the magnetic recording surface.
- o When writing on a label adhered to a diskette, use only a felt tip pen. If possible write on the label before adhering it to the diskette. Do not write directly on a diskette jacket.
- o Never attached anything to the diskette with a paper clip or staple, as the diskette may become dented.
- o Protect diskette from bending or folding.
- o Never expose diskettes to a source of magnetism. Some magnetic fields are not obvious. Telephones, magnetic paper clip holders, electric typewriters and some electric calculators can generate a magnetic field strong enough to damage the diskette.
- o Cigarette smoke and other floating particles can form an abrasive film on diskettes that can eventually ruin the data storage capability of the diskette.
- o Do not store diskettes in direct sunlight. Maintain an acceptable temperature range (50 - 125 degrees).
- o Always store diskettes in their protective paper jackets.

3.32 Simple wear is another cause of failures. Therefore, it is important that backup copies be made of all high priority diskettes.

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E. Environmental Conditions

- 3.33 It is recommended that magnetic tape be stored at a temperature range of 70 (+/-) 5 F, and at a humidity range of 50% (+/-) 5 % relative humidity.
- 3.34 Experimental evidence shows that the following environmental conditions usually cause tape reading problems:
- o Temperature and humidity cycling in warehouse-grade space. Two specific conditions which can cause problems are as follows:
 1. Cycling tapes to a location where temperature levels or humidity levels or both are below or above the prescribed levels.
 2. Cycling tapes with protruding layers of tape in the middle of the pack.
 - o Excessive temperature and humidity - This combination of conditions occurs in non-air-conditioned space.
 - o Very dry conditions - This causes adhesion of adjacent layers of tape due to static buildup on the tape backing surface.
 - o Strong magnetic fields - Tapes must be stored to avoid proximity to stray, highly powered magnetic fields. Studies by the U.S. Federal Government indicate that three inches is sufficient distance to ensure the safety of tape from erasure by magnetic fields. For purposes of shipment, this is sufficient. But for a computer conditioned environment, an additional five to ten feet should be observed.

Note: For additional information about environmental conditions, please contact the Computer Security Administration Group in Information Systems at General Headquarters.

4. MAGNETIC MEDIA STORAGE FACILITY OPERATIONS

- 4.01 Every magnetic tape used in a computer facility should be stored in a magnetic media storage facility for proper control to be maintained. This includes tapes created on word processing systems, minicomputer systems, microcomputer systems, etc. The only exceptions to the rule are as follows:

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- o Tapes maintained in installations which employ the "Workstation Concept". (See SWBP Section 007-590-303SW, paragraph 2.23).
- o "Scratch tapes" that have been "set up" as a part of daily processing. These tapes can be retained in the computer facility until processing is complete.
- o Tapes that are created outside of the computer room (i.e., foreign tapes). These tapes should be retained in the creating location until they are ready to be processed by the computer facility.
- o Original AMA tapes created in the Central Office. These tapes are to be controlled and secured in accordance with Revenue Accounting Practice (RAP), Part 6.

4.02 A magnetic media storage facility can be controlled manually or through the use of a mechanized tape control system. The Tape Management System (TMS) is used in the majority of Southwestern Bell Data Centers. Where appropriate, this section differentiates between the two types of tape library control systems.

4.03 Note: Information in this section which applies to TMS operation is supported by the Data Center Support Group in Information Systems at General Headquarters. Questions concerning TMS should be directed to this group.

A. Controls

4.04 Volume Serial Number: Each tape volume in a magnetic media storage facility must be identifiable. This should be done by assigning a volume serial number to each tape. The storage facility should then be set up with a slot or home location for each volume serial number. Each volume should then be stored in its assigned location. For ease in operator handling, all libraries (TMS, foreign, etc.) should be organized in volume serial number order.

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- 4.05 Volume Serial Number Composition: The serial number will consist of six positions as follows:
- o First position - volume type identifier, which is numeric. The first position on tape volumes will be assigned as follows:
 1. 0 thru 9 - all tapes initialized as standard labels (SL)
 - o Second position - division code, which is alphanumeric. To determine the division code used, contact the Data Center Support Group at GHQ. They are directly responsible for the tracking and assigning of unique division codes for tape volume ranges at each data center.
 - o Third through sixth positions - four digit serial number ranging for 0000 to 9999.

4.06 Volume Serial Number Label

- o For 3420 reels:
 1. To physically identify each volume, a Volume Serial Number Label should be adhered to each volume. This label must remain on the volume until the volume is retired or replaced. The label should be affixed to the canister, seal belt, or E-Z load cartridge. The adhesive on the back of the label should be composed in such a manner that the label can be removed. (See Exhibit 1 as an example.)
 2. An additional Volume Serial Number Label should be fixed to the flange of the reel, but not toward the hub and rim of the flange. The label should be a round label, approximately two inches in diameter. The adhesive on the back of the label should be composed in such a manner that the label can be removed.

3. To complete the Volume Serial Number Label:

Assign a Volume Serial Number as outlined above.

Post the Julian purchase date or create date of each volume.

Attached the Volume Serial Number Label in a prominent place on the front of the tape reel. Do not place this label on the certification density label or on the finger hole.

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4. A Volume Serial Number Label will normally be prepared once for each tape volume. Only when a tape is transferred from one type of usage to another should the original Volume Label be replaced. It is recommended a new label be prepared and the old one discarded.

o For 3480 cartridges:

1. To physically identify each volume, a Volume Serial Number Label should be adhered to each volume. This label must remain on the volume until the volume is retired or replaced. There should only be one Volume Serial Number Label on a cartridge. This would be the 3-1/8 x 3/16 label affixed to the indented slot on the spine of the cartridge. The adhesive on the back of the label should be composed in such a manner that the label can be removed.
2. The additional customer label should only be used when a cartridge is to leave the premises or is flagged as a "problem" cartridge. The problem would then be described on the customer label.
3. It is recommended the label be removed when replacing the cartridge. However, if it does not adhere completely to the new cartridge, making it free from contaminants, the label should be replaced.

4.07 Volume Transmittal - The Volume Transmittal is the form to be used when volumes are sent to a location outside the computer facility. (See Exhibit 2 as an example.) The Volume transmittal is a two copy form which is filled out before the volumes are sent. One copy of the form should be forwarded with the volumes; the other copy should be retained in the sending office for use in follow-up action to recover the volumes at the appropriate time. Upon completion of the use of the volumes at the outside location, the copy received should be completed and returned to the sender, along with the volumes. The copy retained by the sender should be filed. If the volumes have not been returned in a reasonable length of time (45 days), follow-up action should be taken. The Volume Transmittal forms should be retained for audit purposes, one month after the tape has been returned.

4.08 Volume Transmittal Form Completion - Any locally developed form should include at least the following parameters:

- o The name and address of the person or office to whom the volume(s) is being sent.

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- o The current date.
- o The name of the file.
- o The volume serial number of the volume(s).
- o The total number of reels in the file.
- o The tape density (BPI).
- o A brief comment indicating the reason for transmission.
- o The date that the volume is mailed.

Note: If at all possible, data centers should refrain from sending TMS volumes off-site for reasons other than disaster recovery. Once tapes are out of the data center, they are out of your control and the condition of the volume may come back to contaminate the cartridge or reel library. In this respect, it is advisable to create a range of volumes strictly used for transporting data in and out of the data center.

If the tape is under TMS control, the 'Out-of-Area' and 'Out Date' fields in the TMC should be updated to reflect the change in status, using the on-line inquiry program.

4.09 When a volume is returned from another computer facility, it should be accompanied by the copy of the Volume Transmittal. The following instructions apply to returned volumes without transmittals:

- o Withdraw the original copy of the Volume Transmittal.
- o Indicate on the original copy the tape has been returned by initialing and dating the copy. Place the copy in a dead file to be retained for one month.
- o If the volume can be scratched, then it should be degaussed and serialized for reuse.
- o If the computer facility is a TMS office, the Out-of-Area field in the TMC must be updated to reflect the change in status, using the on-line inquiry program.

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- 4.10 Log of Foreign Volumes - If a computer facility is receiving a daily tape from a foreign computer facility to be used as input to their processing cycle, a log of these tapes should be kept. The creating computer facility should write a sequential number on the data set label so the receiving computer facility will know if they have missed one as well as knowing the order the tapes are to be processed. The sending computer facility should keep the same type of log as a record of what has been sent. (See Exhibit 3 as an example.)
- 4.11 Miscellaneous foreign volumes received should be logged in the Log of Foreign Volumes. This will provide a record of foreign volumes residing in the computer facility.
- 4.12 Extended Retention Request: The Extended Retention Request form (see Exhibit 4) should be used to request the holding of a tape beyond its normal retention period for some specific purpose. This request should be retained for audit purposes, 24 months following release of the tapes. Any person desiring a tape to be held beyond its normal retention period must submit the request in writing to the supervisor in charge of the magnetic media storage facility. This request must contain the following information:
- o The date the request was made.
 - o Which tapes are to be held; e.g. volume serial number(s), DSNAME, month, year, and billing period or cycle.
 - o The new expiration date.
 - o For whom the tape or tapes are being held, and the person's telephone number. This should be the originator of the request so the person can be contacted if the retention period is questioned.
 - o The reason for which the tapes are being held; e.g., for a study.
 - o Acknowledgement that the Data Center User Group responsible has been notified of the change, their name and contact number.

Once the form is received in the tape library, it should be initialed and dated the day the form is received. When the TMC is updated, the librarian should again initial and date the form.

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- 4.13 Extended Retention Request File: The requests should be kept on file two years following the scratching of the file.

Since the retention period will be updated in the TMC, no manual intervention is needed from this point. It is now the responsibility of the person who requested the extension, to track the volume and request another extension if needed.

The extended or updating of many volumes may be handled by one request as long as a highlighted DSN listing is provided and the information required above is included on the Extended Retention Request form.

B. Recurring Functions

- 4.14 Each storage room should have a general purpose schedule arranged by Julian date. This schedule should contain any reminders needed on a future date. Each day this schedule should be referenced for TMS runs, etc. that apply to that date.
- 4.15 The Julian Date Schedule should be reviewed for special items.
- 4.16 The TMS Scratch and Clean List should be referenced for a list of all the tapes available for reuse on that Julian date.
- 4.17 In a TMS controlled computer facility, each output tape returned to the magnetic media storage facility should be filed in the correct home location. If the tape is rejected by TMS, the tape should be refilled in its correct home location where it will be pulled for investigation after TMS maintenance is completed. The reject code should be researched and appropriate action taken to regain the use of the tape. (Contact the CA-1 User Guide for an explanation of the reject codes).
- 4.18 All tapes used on computers should be filed in the media library when not being used. Computer facilities using manual controls should check all tapes to make sure that the write ring is removed before the tape is refilled. Offices that have tapes stored in the storage facility that are not under the control of TMS must exercise extreme care in refiling tapes, since a TMS controlled tape mounted on a non-TMS system can be written over. Write rings may be left in the tapes in TMS controlled computer facilities at the discretion of local management. It is advisable in a TMS environment to have the RPQ feature on the tape device removed. TMS and MVS will ensure data integrity in the possible writing over of data.

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In a 3480 environment all cartridges should have the file protect thumbwheel in the unprotected position. This will eliminate the need to continually check the cartridge status and will quicken mount pending time. However, in the event a cartridge is not accepted on a tape device, check the thumbwheel if the operator display panel indicates it is in the wrong position.

Tapes designated to be stored off-premise should be rotated daily (see Mechanized GAP Part K).

C. Occasional Functions

4.19 The following instructions should be followed when preparing new volumes for use or when replacing tapes:

- o Assign the lowest available volume serial number within the tape series. The numbers vacated by tapes removed from service should be reassigned by local management determination in order to be feasible for each computer facility.
- o Verify the Volume Serial Number is in scratch status.
- o Prepare a Volume Serial Number Label and apply to the tape.
- o The tape should then have the serial number written internally (i.e. serialized). For systems that do not employ TMS software, IEHINIT should be used to serialize volumes. For systems with TMS software, this can be done through the use of TMSTPNIT. By serializing volumes via TMSTPNIT, you are assured the TMC will be updated with the appropriate information. It should be noted, however, that some applications (e.g., COSMOS, LMOS, CRAS, etc.) have systems that will not accept an internal conventional serial number.
- o The tape should then be filed in the scratch area or in the tape's volume serial number slot.

Note: Operations employing the "Workstation Concept" should ensure there are adequate scratch tapes in each scratch subpool before utilizing the new volumes. The new volumes must be accounted for when determining your current scratch pool.

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- 4.20 To retire a volume, the old tape must be placed in scratch and delete status and then destroyed before the new tape is placed in active status. This will ensure there are no duplicate Volume Serial Numbers in your library.
- 4.21 Because of the high cost of a complete physical inventory, a physical inventory is required only when the following occurs:
- o Establishing a new magnetic media storage facility.
 - o Moving or reorganizing an existing storage facility.
 - o A request by Internal Auditing as a result of a computer audit.
 - o It is deemed necessary by the computer facility.
- 4.22 When a physical inventory is needed:
- o Prepare a checklist showing all volumes serial numbers assigned to tapes.
 - o The list should be physically compared to each tape in volume storage in the computer room and compared to those tapes existing outside the computer facility.
 - o All discrepancies should be resolved before the inventory is considered complete.

Note: The TMS Volume Serial Master can replace a manually prepared checklist.

For non-TMS operations, an inventory listing of all Volume Serial Numbers assigned to tapes should be made when tapes are put in service. A physical inventory would then start with the previously prepared list.

5. TAPE MAINTENANCE PROCEDURES

A. Tape Cleaning

- 5.01 As stated in item 3.02, most tape errors are caused by contaminants deposited on the tape surface by external sources or by wear of the tape itself. For 3420 reel media, cleaning the tape removes many of the problems causing tape errors. Since it is not reasonable to clean all the tapes on a regular basis,

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it is necessary to isolate those tapes which do exhibit a definite need for cleaning. For tapes used in normal processing, the number of temporary I/O errors should be used as a means of identifying those tapes which need to be cleaned. This can be tracked and measured via the CA-9 R+ reports.

For 3480 cartridge media, keeping the device clean plays a significant role in the performance of the cartridge. This holds true for 3420 reels as well. However, errors will appear as passes over the read/write head increase and the age of the media increases. Given the current vendor warranty programs, all 3480 media should be tracked via temporary errors. When a short trend is established, signifying it is the tape and not the device, the cartridge should be replaced and the old one sent back to the vendor. Due to the low cost of the cartridge and the warranty programs, we cannot cost justify extensive investigation into 3480 errors.

5.02 Computer facilities that have tape cleaner/evaluators for 3420 media, can establish their cleaning frequency based upon the results of tape evaluation. In addition, CA-9 R+ reports and TMS reports, if applicable, can be used to determine when a tape needs to be cleaned, as follows:

- o The tape librarian should receive R+ reports daily. These reports should be the primary means of identifying tapes that need to be cleaned. The TMS Scratch List should be used to determine which of these are scratch tapes and which are live files. (Live files may be cleaned, but not evaluated).
- o If identified by the CA-9 R+ and TMS reports, they can be compared to EREP reports if available, to determine if a volume needs to be cleaned. Again, trends in temporary errors will determine if a volume needs to be cleaned.
- o Some tapes require special handling because of the critical nature of the data stored on them or to the limitations of the hardware on which they are used. Most of these are tapes which go in and out of the computer facility on a regular basis (AMA tapes). These require cleaning more often based on frequency of use and the criticality of readability (See RAP Part 6, Section 2.07).

B. Tape Replacement

5.03 When a tape becomes severely worn, has a contaminant which cannot be removed, or has physical damage beyond repair, it will cause errors with virtually

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every use. At this point it is desirable to remove this tape from normal processing. If the errors occur within the first 400 feet of BOT or EOT they may be salvaged. Otherwise, the volume should be replaced with a new tape. These tapes may be identified by their age, permanent I/O errors or tape evaluator results.

- 5.04 Any tape which has an uncorrectable permanent error (one that remains after cleaning) should be replaced.
- 5.05 Computer facilities which have a tape evaluator for 3420 media, should use criteria based on the evaluator results to identify tapes which should be replaced. Any tape used for normal processing should meet the following guidelines as closely as possible (unless vendor guidelines are radically different because of the tape machinery used):
- One track errors - 100 or less
Two track errors - 10 or less
Three track errors - 0
- 5.06 If it is determined that the errors are near the ends of the tape (15-20 feet), this section should be cut off and the reflector strip replaced. The tape should then be degaussed and reserialized. At least 2000 feet of tape should remain on the reel if the tape is to be used for normal processing.
- 5.07 Any tape with physical damage which is not near the end should be replaced.
- 5.08 All 3420 volumes with broken reels or hubs or open flanges should be degaussed and destroyed. Minute fragments of plastic may be embedded in the tape and cause damage to the tape drive.
- All 3480 cartridges that have a 'hairline' crack should be degaussed and sent back to the vendor for replacement. Similar to 3420 volumes, minute fragments of plastic may be embedded in the tape and cause damage to the drive as well as, contaminate other volumes processed on that particular tape device.
- 5.09 Any 3420 volume which is older than 8 years and has come up for cleaning should be replaced. Due to the questionable life of a 3480 cartridge, age in comparison to tracking temporary error trends, will determine when a cartridge should be replaced.

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- 5.10 All tapes should be degaussed before being destroyed.
- 5.11 A Log of Tape Maintenance (see Exhibit 5) should be kept as a record of the tapes replaced. Each time a tape is replaced, the BRTHDT field in the TMC should be updated via the on-line inquiry program.

C. Tape Shipping

- 5.12 Tape ends should be secured with either plastic strips or sponge rubber tips to prevent unwinding of the tape pack.
- 5.13 A visual check should be made to ensure that the external labels are firmly and securely attached to the tape reel and/or cartridge.
- 5.14 The tape should be checked to ensure that the "write enable" ring for 3420 volumes has been removed.
- 5.15 When shipping 3420 volumes in canisters, the canisters must meet the following requirements:
 - o Non-magnetic and transparent so that the labels can be read without opening.
 - o Thoroughly clean.
 - o Dust proof, with a positive action latch mechanism. Most canisters on the market meet these requirements.
- 5.16 The tape canisters are not to be used as the tape shipping container. The tape canisters must be placed in a shipping container that will protect the tape canister from damage.
- 5.17 When shipping either 3420 reels or 3480 cartridges, the use of "bubble packing" is preferred to protect the volume from damage.

NOTE: For information about tape shipping containers or about tape shipping container vendors, please contact the Data Center Support Group in Information Systems.

- 5.18 Prepare the "Volume Transmittal" form, listing each volume to be shipped. One copy of this transmittal should be placed inside the tape shipping container, and one copy should be maintained in the originating computer facility.

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- 5.19 Tapes should be transported in a manner which will ensure their security and maintain their integrity.
- 5.20 If company vehicles (e.g., autos, vans, trucks) are used to transport tapes (or other types of magnetic media) rather than arranging transportation with a professional vendor, the following additional shipping procedures should be considered:
- o There should be no smoking in the transport vehicle during the time of transfer.
 - o The vehicle should be designed to provide the proper temperature and environment for tapes during any climate; and should not be identified as a tape transportation vehicle.
 - o Heavy objects should not be transported with the tapes. If these items must be transported with the tapes, then they should not be placed on top of tape shipping containers.
 - o The employee who transports the tapes should not be assigned a disaster recovery task which could conflict with the employee's magnetic media transportation duties during or after a disaster.
- 5.21 Upon receipt of the tapes, the receiving office should verify that all tapes on the packing list are included and are in good condition. The packing list should then be noted with the current date and the employees initials. A copy should be forwarded to the sending office indicating the shipment has been received.

6. AMA TAPE MANAGEMENT

A. Tape Administration

- 6.01 When an AMA tape is received in the tape library (or in a specially designated unit or center for AMA tape management), the tape must be accompanied by a SW-5233 form that has been prepared in the Central Office that created the tape.
- 6.02 Information on the SW-5233 form should be compared to the external label (SW-4192) of the tape. If discrepancies are discovered, then the sending central office should be notified.

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- 6.03 The SW-5233 form should be logged in an AMA recorder group log for reference and for accounting purposes.
- 6.04 As a control option, the SW-5233 can accompany the AMA tape until the tape has been processed and returned to the tape library for storage. If problems occur in processing the tape, the central office should immediately be notified, the "Other Processing Problems" portion of the SW-5233 yellow copy should be completed, and subsequently returned to the central office.
- 6.05 The SW-5233's should be retained in an AMA tape management area for six months.
- 6.06 Each AMA tape should be logged into an AMA tape log, i.e. SW-4383. The SW-4483 log should be updated at this time indicating the date and time the tape is received as well as other information applicable to the creation and return of the tape volume. This form is an excellent tracking mechanism for the flow of AMA tape volumes.
- 6.07 Original AMA tapes should be retained in the computer facility tape storage environment for 45 days. At times, there may be requests to retain the tapes longer than the required time frame. Cost justification must be documented due to the impact on the rotation of these AMA volumes.
- 6.08 AMA tapes not stored in the computer facility's tape storage environment should be controlled and secured in accordance with Revenue Accounting Practice, Part 6.
- 6.09 AMA tapes stored in the computer facility's tape storage environment should be controlled as prescribed in this practice.

B. AMA Tape Rewind

- 6.10 Certain AMA tapes need to be rewound before processing depending on the recording switch. If they are received in the tape library rewound by the central office, the central office should be notified immediately and the tape should be investigated for data loss.
- 6.11 AMA tapes should be rewound on machines without R/W heads to prevent stored data from being accidentally erased.

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- 6.12 Tape cleaner/evaluators with a read/write head (mechanism) should not be used to rewind AMA tapes.

C. AMA Tape Maintenance

- 6.13 Appropriate computer facility personnel should be assigned the responsibility of determining whether sufficient AMA tape is available for reuse. It is recommended AMA tapes have a minimum of 2000 feet of tape on a reel.
- 6.14 Reflective markers should be added to damaged AMA tapes where sufficient tape is available for reuse.
- 6.15 Frayed, wrinkled, or otherwise damaged AMA tape ends should be crimped.
- 6.16 All AMA tapes should be evaluated at '0' error before being returned to the central office.
- 6.17 Detailed guidelines regarding tape maintenance are listed in Section 5, "Tape Maintenance Procedures."

D. AMA Tape Cleaning, Evaluation, and Recertification

- 6.18 AMA tapes should be cleaned and evaluated after their normal 45 day retention and prior to returning the tapes to the respective recorder groups.
- 6.19 AMA tapes to be evaluated are identified from the AMA tape management area control.
- 6.20 All AMA tapes should be degaussed after evaluation before being returned to the central office.
- 6.21 The retention period for data on AMA tapes should be 45 days. If retaining tape data for the CABS application, the retention period for CABS tapes should be 60 days.
- 6.22 Recertified AMA tapes are normally not used for AMA tape recording because the recertification process does not guarantee an error-free tape. However, if the recertification process is used, the tapes must be reevaluated in the AMA tape management area to ensure '0' error.
- 6.23 Newly purchased AMA tapes should be cleaned and degaussed before use in AMA recording. It is also recommended, when feasible, to evaluate the tapes before use in AMA recording.

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- 6.24 AMA tapes with single track errors in the commonly used portion of the tape should be removed from the AMA recording process.
- 6.25 AMA tapes retired from use in AMA recording or converting can be used for other applications supported by the computer facility. Alternative: AMA tapes with fewer than 10 errors can be sold to an "outside" concern; those AMA tapes with 10 or more errors can be discarded. (This alternative depends on the applications' need for retired AMA tapes.) As required, it is extremely important the retired AMA tapes be degaussed as well, before considering these alternatives.
- 6.26 Modern tape cleaner/evaluator hardware can now allow an "18-inch delay" to occur during evaluation so that every part of the tape is "erased" except for the tape header. This function should not be used for AMA tapes since the exact location of header information may not be within the 18 inches. Thus, message data could be left on the tape. The central office transports will probably reject the tape due to data being left on the tape.

7. TAPE MANAGEMENT SYSTEM (TMS) OVERVIEW

A. General

- 7.01 The purpose of this section is to provide instructions for the operation and maintenance of TMS.
- 7.02 TMS is a software package designed by Computer Associates (formerly a UCCEL Corporation product; UCCEL was acquired by Computer Associates in August, 1987.) The package has been purchased by Southwestern Bell Telephone Company to be used in it's computer facilities. TMS is a completely mechanized tape library system. Information is gathered as it occurs and is used to manage a computer facility's magnetic media storage facility.
- 7.03 Advantages of a mechanized magnetic media storage facility include the following:
 - o Reduction of clerical time in preparation of manual logs and lists.
 - o Increase of computer throughput as a result of decreased clerical duties of computer attendants.
 - o Provision of additional data set protection other than protection provided by the operating system.

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- o Provision of a method of protection and control of off-premise storage.
- o Provision of immediately available information concerning data sets within the library.

B. How TMS Functions

- 7.04 Information concerning tape volumes under control of TMS, resides on the Tape Management Catalog (TMC). The TMC is a disk data set that is updated each time a tape data set is used or created. This update does not require execution by the operator, but occurs as a result of interaction between the operating system and TMS program modules.
- 7.05 Maintenance of the TMC is accomplished by programs usually run on an evening or night shift. Output from the maintenance programs in the form of various printouts is used to manage the storage facility. Lists provided include a listing of all volumes in data set name order, and a list of all tapes as they become scratch tapes.
- 7.06 In order for TMS to function properly, the following conditions must exist in the storage facility:
- o Each physical tape volume must have a unique volume serial number. No duplication of volume serial numbers can be allowed.
 - o The volume serial numbers should be assigned in an orderly and contiguous manner.
 - o The internal volume serial number must be identical to the external volume serial number.
 - o Tapes that are created on an unsupported system (e.g., UNIVAC, CADE, PDP/IIIs) should be separated in a volume serial number range of their own.
- 7.07 Data sets created on an unsupported system may be controlled by TMS by manually updating the TMC with batch programs. If a computer facility elects not to control data sets created by an unsupported system, then some form of manual logging must be in place for these data sets.

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7.08 TMS is not run in a partition or a region as an application program. TMS interfaces with the operating system to gather information to manage a magnetic media storage facility. This is accomplished by "hooks" in the operating system which enable TMS to gain control at tape OPEN, CLOSE, and on END-OF-VOLUME condition.

7.09 TMS requires the following disk data sets:

Tape Management Catalog (TMS.TMC)

Audit Data Set (TMS.AUDIT)

TMS Load Library (SWBT.PRODUCTS, SWBT.LPALIB)

Appropriate parmlib members (SWBT.PARMLIB)

7.10 In a multi-processor environment, the data sets listed in item 7.09 above, must be on a device shared between all CPUs. The TMC and Audit data sets must be separate devices for maximum protection.

7.11 The TMC (TMS.TMC) is the master data base of the tape library. The size of the data set is dependent on the size of the tape library. The TMC contains information on each physical volume as well as all data sets (files) residing on those volumes.

7.12 the Audit Data Set (TMS.AUDIT) is used to store daily activity to the TMC. The space required for the data set is dependent on the number of tape data sets that are created each date and the number of daily on-line and batch updates to the TMC.

7.13 The most noticeable change in operations when using TMS is the absence of retention halts ("E" Messages). When the Operating System tries to write on a tape which contains an expiration date that has not been reached under TMS, the tape will be dismounted with a condition code and another scratch tape will be requested.

7.14 When there is an attempt to write on a tape that is not a scratch, this message will be issued:

IECTMS3 dd,vvvvvv is not scratch (NN)

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- (NN) is a code which will explain the reason the tape was dismounted. These tapes should be returned to the library for investigation. A complete list of codes is found in Appendix B of the CA-1 TMS User's manual.
- 7.15 TMS must be initiated after each IPL. Instructions for initiation are found in the CA-1 TMS manual. (In practice, TMS is automatically brought up by SWSS, and the necessary halts are answered by SWSS, Southwestern Subsystem).
- 7.16 Any tape which has not been accounted for in the TMC can be read or written on only by using special JCL considerations. If a tape is not in the TMC, the label parameters in the JCL must be entered as follows:
- o LABEL=EXPDT=98000
 - o This will cause TMS to be bypassed while reading or writing on that particular tape.
- 7.17 TMS has an additional feature which allows cycle control over data sets. By using the parameter 'LABEL=EXPDT=99CCC', up to 256 copies of the data set will be retained. When the desired number of data sets is reached, the oldest data set will be scratched. (99CCC-CCC is the number of cycles to be controlled). Note: This feature is independent of catalog control (GDG indexes).
- 7.18 Another type of tape file retention is possible with TMS. By using 'LABEL=EXPDT-98DDD', the file will remain active (unexpired) until 'DDD' days have elapsed since the file was last accessed.
- 7.19 At the time of installation, all cataloged procedures and JCL that require tapes outside the TMC (i.e., No Label tapes or tapes that use BLP) must be changed to reflect the parameter 'LABEL=EXPDT=98000'.
- 7.20 Further explanation of JCL concepts can be found in the CA-1 TMS manual.
- 7.21 Tapes that have been created on an unsupported system are not automatically updated to the TMC. These tapes must be manually updated to the TMC through the console using program TIQ, through the batch program TMSUPDTE, or through a TSO terminal using the TIQ CLIST.

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- 7.22 When a tape has been created on an unsupported system, it cannot be used as input on a supported system until the TMC has been manually updated. This will cause a problem when the tape is created and must be immediately used as input on the supported system. 'LABEL=EXPDT-98000' may be used, but this will cause TMS to be bypassed for the input tape.
- 7.23 It is operations' responsibility to supply the tape librarian with a listing of tapes that are created on any unsupported system. These tapes can then be manually updated to the TMC.

C. TMS Reports

- 7.24 The three primary TMS reports used by the tape librarian to manage the tape library are:

TMSRPT4	Volume Serial Number Master
TMSRPT2	Data Set Name List
TMSCLEAN	Scratch and Clean List

- 7.25 Volume Serial Number Master - This report is created nightly and gives a list of all volume serial numbers in the TMC including scratch tapes. The list is in volume serial number order and contains the following information:

- o Volume Serial Number
- o Data Set Name
- o Creating Jobname
- o Volume Sequence Number
- o Creation Date
- o Creation Time
- o Expiration Date
- o 7, 9 or 18 Track Label Indicator
- o Number of Secondary Data Sets
- o Out-of-Area Code
- o Date Taken Out of Area

- 7.26 Data Set Name List - This report is created nightly and gives a listing of all non-scratch tapes in the TMC. (See Exhibit 6 as an example.) The list is in Data Set Name order and contains the following information:

- o Volume Serial Number
- o Data Set Name
- o Creating Jobname

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- o Volume Sequence Number
- o Creation Date
- o Creation Time
- o Expiration Date
- o 7, 9, or 18 Track Label Indicator
- o Out-of-Area Code
- o Date Taken Out of Area

- 7.27 Scratch and Clean List - This report is created nightly and gives a listing of all tapes that have become scratched on this particular date. The listing is in volume serial number order. (See Exhibit 7 as an example.)
- 7.28 The CA-1 TMS manual contains a listing of all TMS reports and an explanation of their use. JCL procedures for the utility programs can also be found in the CA-1 TMS manual.

D. On-Line Inquiry

- 7.29 On-line inquiry is a feature of TMS which allows the TMC to be accessed through the console.
- 7.30 On-line inquiry gives the computer attendant or tape librarian immediate access to TMC information.
- 7.31 Instructions about executing the program TIQ can be found in the CA-1 TMS manual.

E. Proper Usage Of TMS

- 7.32 It will be the tape librarian's responsibility to provide the proper JCL to execute the nightly maintenance runs.
- 7.33 The maintenance printout should be returned to the tape library as early as possible each morning.
- 7.34 The Volume Serial Number Master (TMSRPT4) should be filed for historical reference. Microfiche has several advantages for this purpose.
- 7.35 The Dataset Name List (TMSRPT2) should be used to select input tapes for job setup.

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- 7.36 The Scratch and Clean List should be used to pull scratch tapes needed for the next 24 hours of processing.
- 7.37 As required, the batch program, TMSRPT3 may be executed to forecast availability of scratch tapes during the next seven days.
- 7.38 Each morning, tapes that have been rejected by TMS must be investigated. The code that was issued with the message IECTMS3 should be placed on a small label and attached to the tape. It will be the librarian's responsibility to determine if these tapes are to be returned to the scratch pool or to the tape library.
- 7.39 Tapes created on an unsupported system must be manually updated to the TMC. This can be accomplished using the on-line program TIQ or the batch program TMSUPDTE.

F. Maintenance

- 7.40 The following reports should be run nightly and be made available to the tape library:
 - o TMSCOPY - backup the TMC and Audit Data Sets
 - o TMSCYCLE - Expired cycle control list
 - o TMSCTLG - Expired Catalog List
 - o TMSCLEAN - Scratch and Clean list
 - o TMSRPT4 - Volume Serial Number Master List
 - o TMSRPT2 - Data Set Name List
 - o TMSAUDIT - TMS Activity List
- 7.41 TMSCOPY is used to provide dump tapes of TMS.TMC and TMS.AUDIT. Two identical dump tapes are created for TMS.TMC and one dump tape is created for TMS.AUDIT. For off-premise storage purposes, these tapes should have the following standard dataset names:
 - o TMS.TMC.BACKUP1
 - o TMS.TMC.BACKUP2
 - o TMS.AUDIT.BACKUP1

These tapes should use the label parameter 'LABEL=EXPDT=99003' and be under cycle control. All other TMS utilities should be executed on an as needed or as requested basis.

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G. Off-Premise Features

- 7.42 The Vault Management System provided as a part of TMS is designed to control the flow of volumes from one location to another.
- 7.43 The vault is based on data prepared by the computer facility and used as input into the vault programs. Daily lists are generated to control the flow of tapes from one location to another.
- 7.44 The vault may be described as any identifiable location. In most cases it will be either a fire proof vault or an off-site storage location. Multiple vault locations are permissible.
- 7.45 Section 8 of the TMS User Manual gives complete instructions for implementation of the Vault Management System. Refer to Mechanized GAP Part K for instructions on using the Vault Management System in Southwestern Bell. An interface between Mechanized GAP Part K and VMS has been developed and is documented under separate cover.

Note: Please refer to the Off-Premise Storage Administration and Procedures Manual for all details regarding the Mechanized GAP Part K system.

H. Retention Of Reports

- 7.46 The following reports must be retained for a minimum of one year for audit purposes:
- Volume Serial Number Master
 Data Set Name List
 Scratch and Clean List
 TMSCYCLE
 TMSCATLG
 TMSUPDTE
 TMSAUDIT
- 7.47 All other reports may be retained at the option and length of time selected by the computer facility.
- 7.48 Because of the length of the Volume Serial Number Master and Data Set Name Lists, these reports should be placed on microfiche for retention. The TMSAUDIT report should also be microfiched and held for audit purposes.

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EXHIBIT 1

Volume Serial Number Label (Tape)

Below is an example of a volume serial number label currently used in the St. Louis Corporate Data Center. The required information is included as well as, "in-house" information for tracking the evaluation of the volume. The labels should be affixed to 3420 volumes only.



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EXHIBIT 2

SOUTHWESTERN BELL TELEPHONE COMPANY
Tape Volume Transmittal
 Originating Data Center _____

Current DATE _____ Return DATE _____

TO: _____ Contact NO. _____

DATA SET NAME	VOLSER	VOL	of	9- or 18 TRK	Date Re- turned

The material was received (check one): ___ in GOOD condition or ___ DAMAGED/NOT COMPLETE. Details can be found on the reverse side of this form.

SIGNED _____

TITLE _____

TO BE COMPLETED BY ORIGINATING DATA CENTER

Prepared By: _____

Date: _____

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EXHIBIT 4

*SOUTHWESTERN BELL TELEPHONE COMPANY
Extended Retention Request - Magnetic Tape*

Send To: TAPE LIBRARY - _____ Data Center

Date Requested _____

Dataset Name _____

Volume Serial Number(s) _____

Change Julian Date To _____

Reason for Changing Expiration Date:

Supervisor _____

Has your User Administration Coordinate been contacted about this change?

If not, please do so and provide the name and contact # of person(s) contacted:

Name _____

Contact No. _____

If your U.A. coordinate has not been contacted, please do so:

Requested By _____

Contact No. _____

*For Library Use Only
*Date Received _____ Initials _____
*Date TMC Updated _____
*Tape Scratched _____

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EXHIBIT 4

*SOUTHWESTERN BELL TELEPHONE COMPANY
Extended Retention Request - Magnetic Tape*

Send To: TAPE LIBRARY - _____ Data Center

Date Requested _____

Dataset Name _____

Volume Serial Number(s) _____

Change Julian Date To _____

Reason for Changing Expiration Date:

Supervisor _____

Has your User Administration Coordinate been contacted about this change?

If not, please do so and provide the name and contact # of person(s) contacted:

Name _____

Contact No. _____

If your U.A. coordinate has not been contacted, please do so:

Requested By _____

Contact No. _____

*For Library Use Only
*Date Received _____ Initials _____
*Date TMC Updated _____
*Tape Scratched _____

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EXHIBIT 6

SOUTHWESTERN BELL TELEPHONE CO.										PAGE=0004
TMS REPORT-10 DATA SET NAME SEQUENCE										
VOLSER	DATA SET NAME	JOBNAME	VSEQ	CRDT	TIME	EXPTD	LB-T	AREA-OUT.DATE	LDATE	
3A8276	DAVE.UNLOAD.LASER	KKAGM3CM	005	87303	16.16	87304	DSNB		00000	
2A4167	DAVE.UNLOAD.LOAD	KKAGM3CM	006	87301	17.22	87302	DSNB		00000	
3A8276	DAVE.UNLOAD.LOAD	KKAGM3CM	006	87303	16.17	87304	DSNB		00000	
2A4167	DAVE.UNLOAD.MFSPDS	KKAGM3CM	008	87301	17.22	87302	DSNB		00000	
3A8276	DAVE.UNLOAD.MFSPDS	KKAGM3CM	008	87303	16.18	87304	DSNB		00000	
2A4167	DAVE.UNLOAD.MSRDOC	KKAGM3CM	009	87301	17.23	87302	DSNB		00000	
3A8276	DAVE.UNLOAD.MSRDOC	KKAGM3CM	009	87303	16.18	87304	DSNB		00000	
2A4167	DAVE.UNLOAD.PLI	KKAGM3CM	002	87303	16.14	87304	DSNB		00000	
3A8276	DAVE.UNLOAD.PLI	KKAGM3CM	002	87301	17.21	87302	DSNB		00000	
4A1345	DMS.ARCHCOPY	STAPE004	001	87132	04.23	88132	SUL-18		87132	
3A4019	DMS.ARCHCOPY	STAPE004	001	87149	23.36	88149	SUL-18		87149	
3A5621	DMS.ARCHCOPY	STAPE004	001	87153	03.53	88153	SUL-18		87153	
4A1219	DMS.ARCHCOPY	STAPE004	001	87157	04.12	88157	SUL-18		87157	
2A5151	DMS.ARCHCOPY	STAPE004	001	87160	04.54	88160	SUL-18		87160	
3A7480	DMS.ARCHCOPY	STAPE004	001	87166	23.42	88166	SUL-18		87166	
4A1906	DMS.ARCHCOPY	STAPE004	001	87170	23.32	88170	SUL-18		87170	
3A3550	DMS.ARCHCOPY	STAPE004	001	87177	23.37	88177	SUL-18		87177	
3A2105	DMS.ARCHCOPY	STAPE004	001	87180	23.36	88180	SUL-18		87180	
2A3074	DMS.ARCHCOPY	STAPE004	001	87184	23.46	88184	SUL-18		87184	
3A6333	DMS.ARCHCOPY	STAPE004	001	87187	23.27	88187	SUL-18		87187	
3A7127	DMS.ARCHCOPY	STAPE004	001	87191	23.38	88191	SUL-18		87191	
3A2209	DMS.ARCHCOPY	STAPE004	001	87194	23.55	88194	SUL-18		87194	
3A8673	DMS.ARCHCOPY	STAPE004	001	87198	23.40	88198	SUL-18		87198	
3A8653	DMS.ARCHCOPY	STAPE004	001	87201	23.27	88201	SUL-18		87201	
3A1111	DMS.ARCHCOPY	STAPE004	001	87205	23.35	88205	SUL-18		87205	
3A2401	DMS.ARCHCOPY	STAPE004	001	87212	23.44	88212	SUL-18		87212	
3A7450	DMS.ARCHCOPY	STAPE004	001	87215	23.51	88215	SUL-18		87215	
3A0392	DMS.ARCHCOPY	STAPE004	001	87219	23.51	88219	SUL-18		87219	
3A6956	DMS.ARCHCOPY	STAPE004	001	87222	23.35	88222	SUL-18		87222	
3A7097	DMS.ARCHCOPY	STAPE004	001	87226	23.27	88226	SUL-18		87226	
2A2541	DMS.ARCHCOPY	STAPE004	001	87229	23.38	88229	SUL-18		87229	
3A7553	DMS.ARCHCOPY	STAPE004	001	87236	23.56	88236	SUL-18		87236	
4A1725	DMS.ARCHCOPY	STAPE004	001	87243	23.42	88243	SUL-18		87243	
3A2285	DMS.ARCHCOPY	STAPE004	001	87255	00.00	88255	SUL-18		87255	
3A4268	DMS.ARCHCOPY	STAPE004	001	87258	01.45	88258	SUL-18		87258	
3A7438	DMS.ARCHCOPY	STAPE004	001	87271	23.59	88271	SUL-18		87271	
3A4008	DMS.ARCHCOPY	STAPE004	001	87278	23.51	88278	SUL-18		87278	
2A4381	DMS.ARCHCOPY	STAPE004	001	87286	00.29	88286	SUL-18		87286	
3A0641	DMS.ARCHCOPY	STAPE004	001	87290	01.13	88290	SUL-18		87290	
3A1857	DMS.ARCHCOPY	STAPE004	001	87297	04.10	88297	SUL-18		87297	
3A8019	DMS.ARCHPRIM	STAPE004	001	87307	03.36	88307	SUL-18		87307	
3A0009	DMS.ARCHPRIM	DMSH2JH	001	87051	17.05	89355	SUL-18		87051	
3A2383	DMS.ARCHPRIM	KPAGH2YH	001	87288	08.05	89355	SUL-18		87288	
4A1244	DMS.ARCHPRIM	KPAGH2YH	001	87288	10.43	89355	SUL-18		87288	
2A3698	DMS.ARCHPRIM.DMSC.C03NOV87.T102434	SARH004	001	87307	20.36	87317	SUL-18		87307	
4A1862	DMS.ARCHPRIM.DMSC.C28OCT87.T145048	KPAGH2YH	001	87307	10.24	89308	SUL-18		87307	
3A4285	DMS.REL75.DOCLIB	DMSH2JH	005	87078	21.32	88358	DSNB		00000	
3A4285	DMS.REL75.ISPFLIB	J593H2JH	013	87078	21.46	88358	DSNB		00000	
3A4285	DMS.REL75.ISPMLIB	J593H2JH	012	87078	21.46	88358	DSNB		00000	
3A4285	DMS.REL75.ISPPLIB	J593H2JH	010	87078	21.45	88358	DSNB		00000	
3A4285	DMS.REL75.LOADLIB	J593H2JH	011	87078	21.46	88358	DSNB		00000	
3A4285	DMS.REL75.MACLIB	J593H2JH	006	87078	21.35	88358	DSNB		00000	
3A4285	DMS.REL75.PARMLIB	J593H2JH	004	87078	21.31	88358	DSNB		00000	
3A4285	DMS.REL75.PMRSLMRY	J593H2JH	003	87078	21.31	88358	DSNB		00000	
3A4285	DMS.REL75.PROCLIB	J593H2JH	007	87078	21.37	88358	DSNB		00000	
3A4285	DMS.REL75.SOURCE	J593H2JH	014	87078	21.46	88358	DSNB		00000	
3A4285	DMS.REL75.SULOAD	J593H2JH	002	87078	21.31	88358	DSNB		00000	
3A4285	DMS.REL75.USERWOODS	J593H2JH	008	87078	21.44	88358	DSNB		00000	
2A3394	DMS.REL76.DOCLIB	J593H2JH	015	87078	21.47	88358	DSNB		00000	
2A3394	DMS.REL76.INSTALL	DMSH2JH	005	87300	08.09	88358	DSNB		00000	
2A3394	DMS.REL76.ISPFLIB	DMSH2JH	013	87300	08.17	88358	DSNB		00000	
2A3394	DMS.REL76.ISPMLIB	DMSH2JH	012	87300	08.17	88358	DSNB		00000	
2A3394	DMS.REL76.ISPPLIB	DMSH2JH	010	87300	08.17	88358	DSNB		00000	
2A3394	DMS.REL76.ISPPLIB	DMSH2JH	011	87300	08.17	88358	DSNB		00000	
2A3394	DMS.REL76.LOADLIB	DMSH2JH	006	87300	08.10	88358	DSNB		00000	
2A3394	DMS.REL76.MACLIB	DMSH2JH	004	87300	08.09	88358	DSNB		00000	
2A3394	DMS.REL76.PARMLIB	DMSH2JH	003	87300	08.08	88358	DSNB		00000	
2A3394	DMS.REL76.PMRSLMRY	DMSH2JH	014	87300	08.18	88358	DSNB		00000	
2A3394	DMS.REL76.PROCLIB	DMSH2JH	002	87300	08.08	88358	DSNB		00000	
2A3394	DMS.REL76.SOURCE	DMSH2JH	007	87300	08.11	88358	DSNB		00000	
2A3394	DMS.REL76.SULOAD	DMSH2JH	008	87300	08.16	88358	DSNB		00000	
2A3394	DMS.REL76.USERWOODS	DMSH2JH	009	87300	08.17	88358	DSNB		00000	
3A7989	DMS.SEOF.ILES.G0529V00	DMSH2JH	015	87300	08.19	88358	DSNB		00000	
2A3104	DMS.SEOF.ILES.G0530V00	FILED004	001	87296	01.01	87310	SL-18		87296	
2A2178	DMS.SEOF.ILES.G0531V00	FILED004	001	87298	23.24	87312	SL-18		87298	
3A0453	DMS.SEOF.ILES.G0532V00	FILED004	001	87298	23.24	87312	SL-18		87298	
2A4368	DMS.SEOF.ILES.G0533V00	FILED004	001	87299	23.06	87313	SL-18		87299	
3A6488	DMS.SEOF.ILES.G0534V00	FILED004	001	87300	23.16	87314	SL-18		87300	
3A4053	DMS.SEOF.ILES.G0535V00	FILED004	001	87301	23.12	87315	SL-18		87301	
2A4867	DMS.SEOF.ILES.G0536V00	FILED004	001	87302	23.25	87316	SL-18		87302	
2A4480	DMS.SEOF.ILES.G0537V00	FILED004	001	87303	23.09	87317	SL-18		87303	
2A4541	DMS.SEOF.ILES.G0538V00	FILED004	001	87304	23.14	87318	SL-18		87304	
3A2223	DMS.SEOF.ILES.G0539V00	FILED004	001	87305	23.29	87319	SL-18		87305	
4A1409	DMS.SEOF.ILES.G0540V00	FILED004	001	87306	23.09	87320	SL-18		87306	
3A8907	DMSFIX.D75FX2.LOADLIB	FILED004	001	87307	23.14	87321	SL-18		87307	
3A7175	DMSFIX.D75FX3.LOADLIB	J085H2JH	001	87112	21.06	88220	SL-18		87112	
2A2732	DMSFIX.PMR847.LOADLIB	J495H2JH	002	87155	20.07	88220	SL-18		87155	
2A2732	DMSFIX.PMR847.SOURCE	J495H2JH	001	87155	20.07	88220	SL-18		87155	
3A1049	DS.LOGREC.HISTORY.G0135V00	DMSH2JH	001	87299	08.11	88298	DSNB		87301	
3A7215	DS.LOGREC.HISTORY.G0136V00	DMSH2JH	002	87299	08.11	88298	DSNB		87301	
3A8163	DS.LOGREC.HISTORY.G0137V00	LOGREC04	001	86320	21.35	87320	SL-18		87045	
		LOGREC04	001	86335	21.38	87335	SL-18		87065	
		LOGREC04	001	86337	17.47	87337	SL-18		87059	

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