SELF-MAINTENANCE GUIDELINE

FOR CENTRALLY DEVELOPED

SYSTEMS (CDS) DEVELOPERS

SELF-MAINTENANCE GUIDELINE FOR CDS DEVELOPERS

CONTENTS

1. INTRODUCTION

1.1 Purpose

With the commitment to computer self-maintenance in all the Operating Telephone Companies (OTCs), it is essential that production hardware for CDS deployments be maintainable by OTC technicians. Bellcore CDS developers should be mindful of the potential influence of their using particular hardware in developing an application on OTC selection of hardware for deployment of the application, and should therefore, consider OTC concerns for self-installation and self-mantenance.

This document details those self-maintenance concerns which a CDS developer should consider when choosing hardware for application development. If these issues are addressed positively by the vendors of developmental hardware, the probability of the success of self-installation and self-maintenance efforts in the OTCs will be maximized.

1.2 Reasons For Issue

The reason for reissuing this practice is to provide CDS developers with a guideline that will include consideration of remote diagnostic access and it's impact on self-maintenance issues, and security provisions for this access.

Consideration of remote diagnostic access is especially important since effective maintenance of fault tolerant hardware that is currently available is dependent on the access capability. If application deployment is being considered for this type of hardware remote access and the security provided by the vendor should be detailed.

2. GENERAL

2.1 Applicability

This practice outlines areas for consideration in the selection of developmental computer hardware for centrally developed systems to be deployed in the OTCs. This practice also applies to those systems developed by an outside vendor that are managed by Bellcore. It does not necessarily apply to system prototypes or development efforts undertaken on a region-specific basis.

Under the guidance of the Information System Rules Panel (ISRP) this guideline has been written to facilitate CDS development processor selection flexibility consistent with OTC computer self-maintenance goals. This design is especially pertinent for, but is limited to, the computing segment satisfied by "traditional" minicomputer and superminicomputer processors; the maintenance for which all OTCs have assumed responsibility.

Within this mid-range arena, as new technology is introduced, OTC maintenance forces will determine their ability to adopt appropriate self-maintenance practices. As such, CDS developmental of: a) new hardware from vendors with other established OTC self-maintenance agreements; b) hardware from new vendors with no previously established OTC self-maintenance arrangements; or c) non-portable proprietary operating system and associated hardware implementations, may materially impact the OTCs' ability to successfully perform the self-maintenance function.

It is for these reasons that considerations of self-maintenance concerns and compliance with this practice is mandatory for information systems and subsystems that are developed for deployment to the OTCs. As with any guideline, it is recognized that exceptions may be necessary. These situations must be negotiated with the Minicomputer Technology & Standards Support District (MTSSD) prior to a significant commitment of Bellcore resources.

2.2 Implementation

Administration of this practice is the responsibility of the Minicomputer Technology & Standards Support District (MTSSD) in the Computer Technology Support Division (CTSD) of Bellcore. Further, MTSSD will support CDS developers in complying with this practice by requesting information from the developmental hardware vendors and analyzing that information in accordance with criteria set forth in the following sections of this practice.

The CDS developer is responsible to designate the developmental hardware as early in the developmental cycle as possible, and coordinate with MTSSD.

3. ANALYSIS CRITERIA

Nonproprietary information in the following specific areas is required for MTSSD to analyze self-maintenance aspects of CDS developmental hardware.

3.1 Training

A hardware vendor must provide the title and description of all training courses pertaining to installation, maintenance, operations and administration of the hardware offered. This information must be provided for both hardware and diagnostic operating system.

For each course, the following details are required:

    a. length in days;

    b. location(s) taught;

    c. schedule dates, by location;

    d. prerequisite/entry skill level;

    e. price;

    f. descriptive course outline (including specification of "hands-on" lab time);

    g. order of course presentation.

If a vendor provides a training credit policy for hardware purchase, a statement of that training credit policy (including any limitations on application of these credits) must be clearly specified.

When the vendor recommends job specialization to effectively maintain the hardware, the vendor must provide a description of any suggested partitions in job specialization, including the sequence and description of courses required for each specialization. Specialities could be described as, but not limited to:

    a. operations;

    b. system administration;

    c. hardware installation;

    d. processor diagnostics/test specialist;

    e. peripheral specialist;

    f. hardware support specialist (second echelon support).

All procedures and forms for enrollment in vendor courses must be available to OTC maintenance personnel.

3.2 Documentation

Vendors are required to list and describe all documents available on the topics below. Ordering procedures and prices for each document or set of documents must also be detailed. An indication of the target population for each document is required to determine the number of copies needed. Documents that will be supplied to students attending training courses must also be specified.

1. All design configuration drawings and manufacturing drawings and schematics necessary to:

    a. Trace and isolate equipment faults and alarm interpretation;

    b. Make minor repairs or replace pluggable units, cable and wiring, mechanical assemblies, etc., down to the chip level;

    c. Perform hardware installation—initial system and growth (circuit packs, cables, peripheral devices and I/O expansion).

2. System operations guides/handbook;

3. Routine/preventive maintenance guides/handbooks;

4. Corrective/remedial maintenance guides/handbooks;

5. Diagnostic routines and procedures;

6. System design descriptions;

7. System administration/tuning/configuration guides;

8. All diagnostic operating system documentation;

9. Documentation update mechanisms;

10. Environmental requirements.

3.3 Spare Parts Requirements/Delivery System

In order for a vendor to adequately support self maintenance efforts of the OTCs, it is essential that the vendor provide information to facilitate the ordering of spare parts for processor and all peripheral devices. Outlined below is a detailed list of the required list of the required information:

1. Price list by part, keyed to configuration options;

2. Guidelines for stocking multiple quantities based on the number of systems supported, reorder intervals, failure rates and deployment logistics;

3. Ordering intervals for initial stock, stock growth and reorders;

4. Pricing for any premium parts and services that are offered;

5. Parts required for preventive maintenance so noted;

6. Parts ordering procedures and order lead times;

7. Emergency delivery policies;

8. Parts list keyed to device;

9. Availability of vendor "Repair and Return" programs.

3.4 Tools, Test Sets, and Maintenance Supplies

If vendor hardware requires any special or non-standard tool, test equipment or maintenance supply to effectively perform maintenance procedures, that equipment must be specified and available through the vendor or a vendor authorized third party supplier. The vendor must list and describe the application and use of each tool and test set by option. The details listed below are required:

- Vendor third party supplier identification;

- Price list by item, keyed to configuration options;

- Ordering procedures;

- Guidelines for stocking multiple quantities based on the number of systems supported and logistics;

- List of expendable supplies for preventive and remedial maintenance such as cleaners, lubricants and filters;

- If specified, cleaner and lubricant compositions must be available to avoid introducing contaminants into the computer room environment.

3.5 Maintenance Procedures

A hardware vendor is required to provide an effective maintenance strategy for products offered. This strategy should include a preventive maintenance schedule and procedures for performing PMs. The vendor must also provide a diagnostic sequence for effective fault isolation during corrective maintenance activities. Remote diagnostic capabilities of the hardware provided should be detailed if applicable.

If effective maintenance of a system is dependent upon the remote access of the system by either a vendor or a self-maintainer, the details of the requirements for this capability should be supplied. If specialized software is required for remote trouble analysis and resolution the availability of that software should be detailed and priced. Impact of not using remote access for diagnostics should be stated.

If vendor remote access is present in a system the details of security for that system must be adequately detailed. User lock-out of remote access should also be detailed.

3.6 Installation

All computer equipment which is to be installed at OTC locations must have UL listing and must be FCC compliant.

The vendor must specify ordering/pricing information for handbooks or procedures to allow self-installation or work-along during installation. Site preparation requirements and verification procedures, along with any warranty impacts, must be clearly specified. Any additional costs which may be incurred as a result of work along installation efforts must be specified.

3.7 System Test

In order to provide for system test and acceptance the vendor is required to detail ordering and pricing policies for the items listed below:

1. Acceptance test procedures;

2. Any software packages used during system test;

3. Any special hardware required i.e., loop-back cables;

4. Handbooks or other procedural documents.

3.8 Cooperative Maintenance Services

It may be desirable to institute a work along program with established vendor maintenance technicians and OTC personnel prior to the OTC assumption of full self-maintenance responsibilities. The vendor must provide information on the availability of such programs. Examples of transition plans (vendor maintenance to self-maintenance) are listed below.

Phase 1—Full vendor system support services

1. Training provided to OTC personnel.

2. Documentation, spares, tools, test equipment procurement.

3. Vendor fully responsible.

Phase 2—Work along program

1. Trainee participation in remedial and preventive maintenance.

2. Vendor fully responsible.

3. Three month phase-in period.

(OTC should have the option to terminate Full System Support agreement at this time.)

Phase 3—Cooperative maintenance

1. Vendor provides remote diagnostic services and consultation during remedial maintenance when required.

2. OTC provides, and is responsible for, on-site labor, parts, tools, test equipment.

3. OTC provides, and is responsible for, preventive maintenance.

4. Vendor provides call-out parts and labor service when required.

Phase 4—Full self-maintenance

1. OTC is responsible for all parts, labor and diagnostics.

2. Advanced Support Agreement—Vendor provides:

    a. Hardware/software consultation services;

    b. Value added call-out services (labor and parts);

    c. Repair service;

    d. Standard interval parts delivery;

    e. Premium interval parts delivery.

3.9 Warranty Provisions

Warranty provisions must be detailed for the following situations:

1. Systems ordered and installed by the vendor;

2. Systems ordered and installed by OTC;

3. BOC stock of parts, tools and test equipment if used during transition from vendor maintenance to full BOC maintenance;

4. Substitution of alternate vendor hardware.

In some cases an OTC may wish to renegotiate warranty coverage or condition to meet a special need or situation. Vendors should indicate whether or not their standard warranty provisions may be tailored through local negotiations with the parties involved, to meet OTC needs. Additionally, the duration and procedures for invoking warranties should also be specified.

3.10 Engineering Change Provisions

Procedures used for notification of applicable Engineering Change Orders (ECOs) and Field Change Orders (FCOs), must be detailed by the vendor. If classifications of ECOs or FCOs exist, these classifications must be defined completely. The parts and labor-to-replace provisions for each classification of engineering change must be specified, along with information on ordering intervals and implementation procedures for each classification of ECO or FCO. An example of a classification scheme for FCOs is outlined below:

Mandatory (M) - An FCO that must be installed as soon as possible in order to make a system/option compliant with the laws or regulations relative to product safety, or an FCO issued to correct a condition that could result in personal injury or property damage.

Required (R) - An FCO issued to correct a condition that significantly affects the performance of a system/option. The FCO should be installed in the applicable system/option as soon as possible.

Improvement (I) - An FCO issued to enhance the system/option performance, e.g., improved speed, capacity, functionality, MTBF or MTTR. The FCO is installed at a mutually agreed upon time.

Responsibility For Purchasing And Installing FCOs

FCO Category	Warranty/Vendor Service	Self-Maintenance Service
M	Vendor	Vendor
R	Vendor	Vendor
I	Vendor	OTC