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Title: **Controlled Parts Management**

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Controlled Parts Management

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ABSTRACT

The Controlled Parts Management (CPM) system is based on industry standard practices for managing inventory. CPM is designed to record the movement of any type of inventory in a defined region referred to as an Account or SubAccount. The system is used to track the receiving, processing, storing and transfer of inventory parts. CPM provides information on parts, quantity and the exact location of the inventory. CPM is a barcode-based-part tracking system currently used to track controlled parts that are used in the R&D and testing of weapons; this tracking helps maintain the part pedigree that is required for certification of a weapon or weapon test. CPM includes bar code data collection software programmed into portable bar code readers for automating physical inventory services and remote transaction capture. CPM interfaces to other Engineering systems and supports a "material content" of a weapons test through the test Bill of Materials and assignment of a unique inventory part in CPM. Additional functionality includes the ability to group or join parts, logically or physically and temporary or permanent, to represent discrete parts, containers, sub-assemblies and assemblies, and groupings.

BACKGROUND

Numerous methods of tracking parts by different organizations had been in use ranging from using paper to PC-based databases. Each organization captured the information that it felt was needed to complete their task, which was always different than the next organization. Inconsistent information led to parts whose pedigree could not be traced throughout its life cycle and made certification more difficult. LANL also lacked the ability to determine an overall accurate inventory of parts across the organizations, which made asset management inefficient.

INTRODUCTION

CPM is based on a relational database (Microsoft Access or Oracle) to ensure data integrity, portable bar code reader integration to maximize data collection efficiency, and bar code label printing capabilities to improve data collection accuracy. Data integrity is maintained using lookup tables and an authorization schema for transactional activity. CPM data model is based upon physical locations called Accounts and Sub-Accounts (see Appendix A, CPM Architecture) that segregate data into areas. Parts belong to an Account or SubAccount and users can only transact on parts in Account or SubAccount to which they have been granted privileges. Each user is added to the system and assigned to a particular group, and each group is assigned a set of CPM functions. Currently we have defined groups such as CPM Administrator, Custodian, Alternate Custodian, User (Read only), Inventory Management. The CPM Administrator maintains lookup tables, whereas the other users mainly do transactions (see Appendix B, Functionality) and data inquiry. Part data integrity is further maintained using a part master that holds information about a part. A part must be entered in the part master and then unique instances of the part are entered into the inventory. CPM captures part-specific data about the part including physical characteristics, ownership and location. CPM then records all part data changes and the transaction history as the part moves through its life cycle across multiple regions and organizations.

CPM makes extensive use of barcodes and portable devices. Each part and each location has a unique barcode that portable and tethered barcode scanners use to identify parts and automate simple transactions (Move, Adjust, Group, Transfer and External Transfer) and physical inventories (Inventory, Move and Adjust). Tethered barcode scanner or manual barcode entry (single or multiple barcodes) can be used in the transactional interface to select parts to transact on. Standard shipping, facility-specific and custom barcodes can be generated and printed on demand.

CPM has been integrated with a ProEngineer CAD package for weapons tests. Authorized users import a bill of materials from the ProEngineer CAD package, which can then be processed to assign in-stock CPM parts inventory or have parts ordered or made. Ordered parts can then be tracked pending receipt. Automation of test BOM fulfillment provides increased efficiency in inventory use that is further enhanced through a consistent part quality rating in CPM. Parts can be assigned a quality rating that represents a required manufacturing standard for a given test.

Grouping of parts for physical or logical reasons has become an integral part of CPM; grouping maintains the discrete parts but associates the parts with the group—examples are parts being shipped between organizations may be logically grouped into a shipping container; and when parts are utilized for certain systems, they become a permanent or temporary physical grouping called an assembly or sub-assembly. Once grouped, all the parts are logically linked and transacted upon as a group. CPM also has two additional permanent groupings that result in deactivation of parts in CPM: Combine and Join. Combine involves combining of like part number parts into an existing part—an example is a bag of bolts gets combined with three discrete bolts. A join involves un-like part numbers—an example is part B is welded onto part A which transforms into part A1.

CPM allows the tracking of nuclear and non-nuclear material. Business rules have been set up to allow accounts to contain nuclear material or not. Users can be assigned privileges to allow transacting of parts with nuclear material or not. Transfer business rules are also in place to prevent transfer of nuclear material to non-nuclear material accounts.

PATH FORWARD

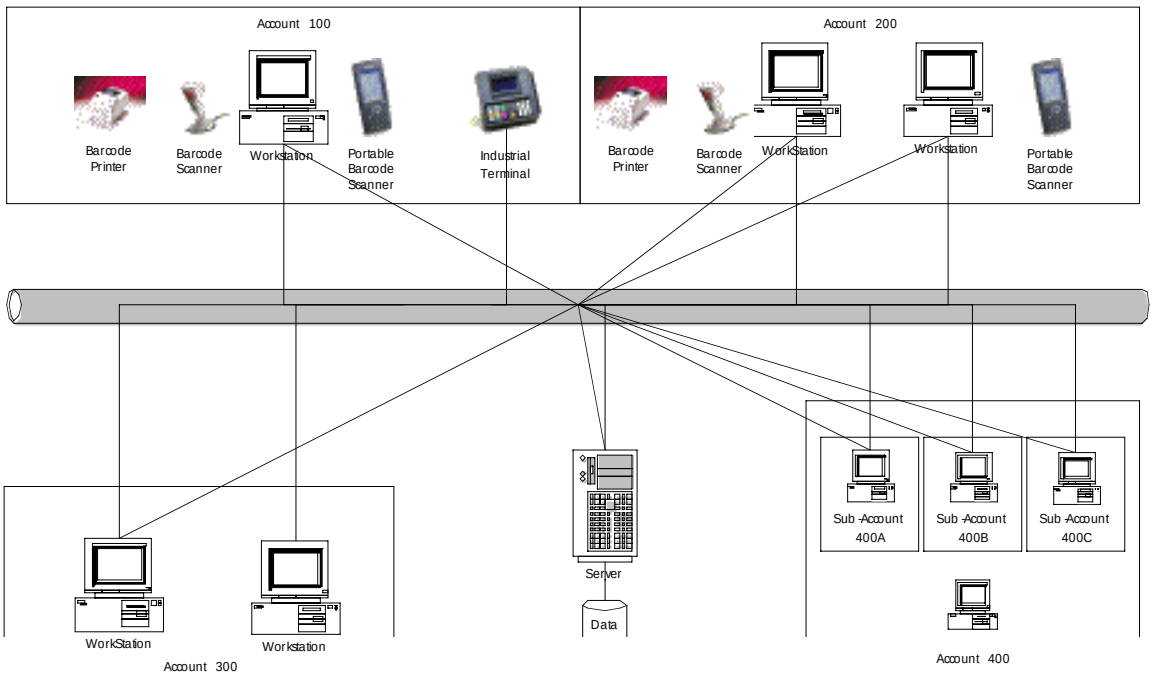
Additional phases include integrating with the enterprise material control and accounting (MC&A) system and other enterprise systems. By interfacing with the MC&A system, nuclear material parts information will be automatically kept in sync and remove the current double data entry. Other enterprise systems of interest are an interface to training and employee information for validation of access to information; interface into external DOE/DOD tracking systems for weapons components and shipping and receiving systems.

The use of industrial stationary barcode terminals is also being evaluated for use on the production floor to capture and automate the production process flows.

SUMMARY

CPM has been in use for over one year with numerous enhancements as users have started to learn the capabilities and the potential of the system. Part of the success of this system is the communications between users and the developers to push their limits and capabilities. Thinking outside the box has resulted in a system that addresses the user’s needs while maintaining flexibility to address future changes.

Appendix A – CPM Architecture



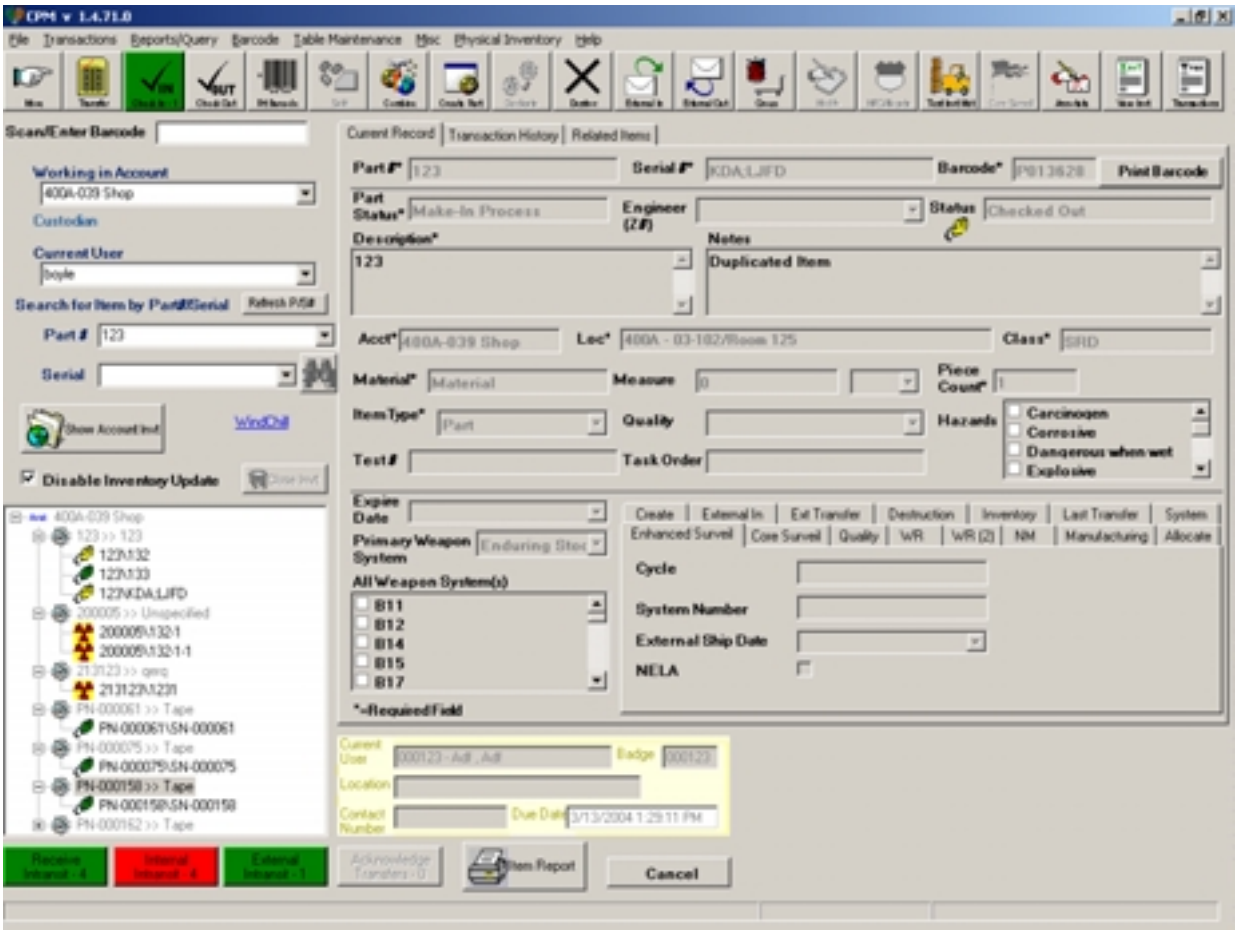
Account and workstation configuration

Accounts and sub-accounts that receive parts from external sources or create parts have a barcode printer attached to the workstation to allow the printing of a label as the part is entered into the system. At any time a replacement barcode label can also be printed. Location barcode labels can also be printed from this barcode printer. Most workstations also have a tethered barcode scanner attached to the workstation. This automates the data entry for transacting with the parts. Each account and sub-account has access to a portable barcode scanner to automate the physical inventory process. Certain accounts and sub-accounts have a portable barcode scanner that can be used to batch transactions where a workstation is not readily available. The portable barcode scanner allows batching of transactions such as Moves, Transfers, Grouping, and External Transfers.

Appendix B – CPM Functionality

1. Vision

The Controlled Parts Manager (CPM) software program provides an integrated method of tracking the activity and status of controlled parts.

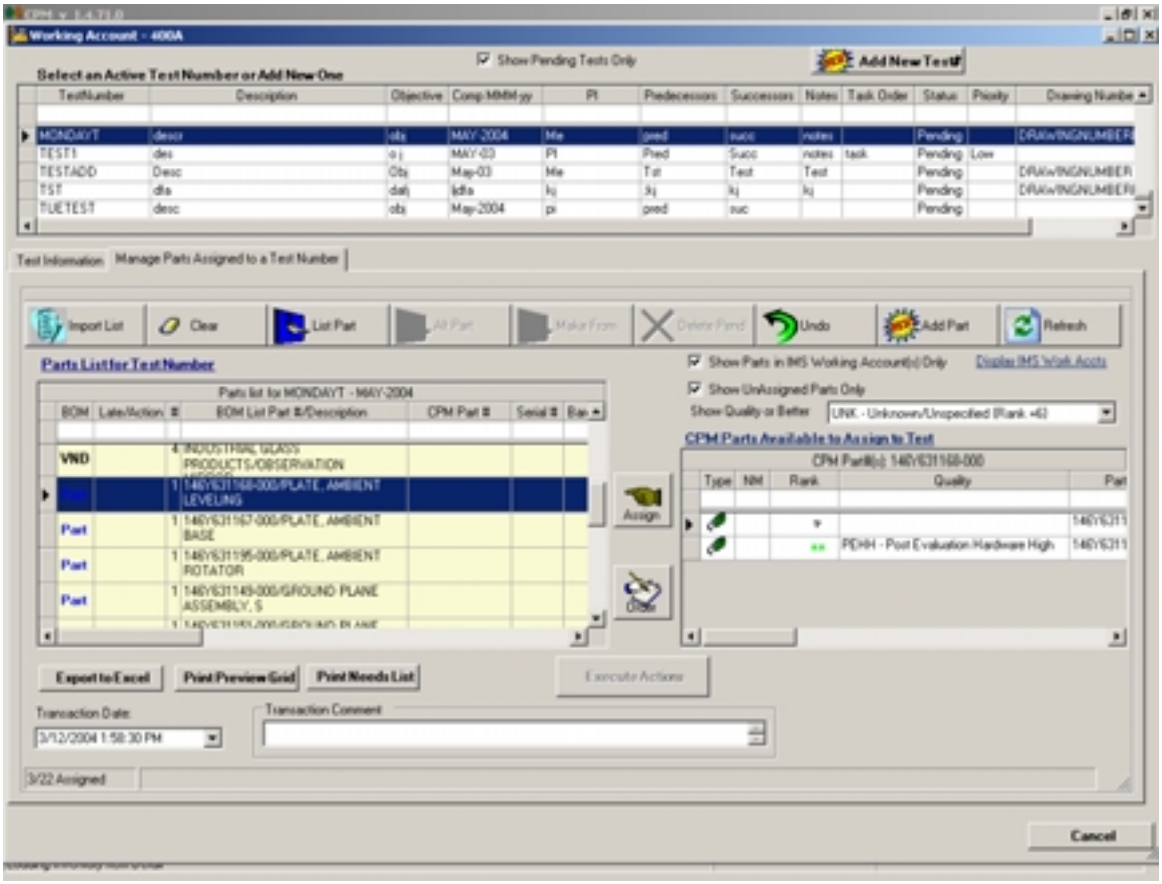


2. Key Functionality

- **Acknowledge -** Acknowledge Transfer from SubAccount through its Parent Account
- **ADC Review -** Allow ADC Review of Part Master Part Number/Description for reporting purposes
- **Adjust -** Adjust part measure and/or quantity

- **Annotate -** Add a transaction comment to the part record for one or more parts
- **Barcode Scanner Setup -** Allow user to reconfigure barcode scanner communication with PC
- **Bulk Update -** Modify a set of fields across multiple CPM parts
- **Check In -** Check In a temporarily transferred part back in to CPM
- **Check Out -** Check out a part—temporarily transfer the part to a person and site not in the CPM system
- **Combine -** Combine multiple parts with the same part number into a single part (add loose bolts to bag of bolts)
- **Core Surveillance -** Allows maintenance of Core Surveillance data
- **Create -** Create a new part within CPM
- **Destroy -** Mark a part in CPM as destroyed
- **Destroyed Modify -** Allow modification of destruction information for destroyed parts
- **Disconnect/ReConnect Standalone Version of CPM -** Future Development of standalone component
- **Duplicate -** Create a new part based upon the entry for a part that is already in CPM
- **External In -** Enter into CPM a part that is coming from a known source outside of CPM
- **External In Grouping –** Reactivate in CPM a grouping of parts that is returning to CPM after being transferred outside of CPM
- **External Intransit -** Remove part placed into External Intransit – undo External Out prior to Verify
  Verify part placed into External Intransit has been received by destination
- **External Out -** Send a part outside of CPM
- **Grid Modify -** Modify fields for multiple CPM parts in grid format
- **Group -** Group physically or logically associated parts together, or empty an existing group
- **Internal Intransit -** Remove part placed into Intransit – undo Transfer prior to Receive
- **Inventory View -** View/query an account's inventory based on transaction type, engineer, and other criteria.
- **Join -** Join two or more parts (weld part B onto part A resulting in part A1)
- **Modify -** Change/update information about a part
- **Move -** Move a part within an account—change its location or part status
- **MPO Allocate -** MPO office can allocate a parts(s) to a project
- **PDA Transactions -** Utilize PDA for capturing transactions that are then uploaded into CPM, review additional data added/completed and execute
- **Physical Inventory -** Physical Inventory of data within an Account/SubAccount. Utilize PDA for tracking the inventory in progress.
- **Print Barcode -** Print/reprint a barcode label for one or more parts
- **Print Custom Barcode -** Print Custom Barcode
- **Print WR Barcode -** Print WR predefined Barcodes
- **Receive Intransit -** Receive part placed into Intransit – second half of Transfer

- **Reprint Check Out -** Reprint Check Out report
- **Reprint Destroy -** Reprint Destroy report
- **Reprint External Transfer -** Reprint External Transfer report
- **Reprint Transfer -** Reprint Transfer report
- **Split -** Split a part into two parts
- **Split Multiple -** Split a part into two or more parts
- **Table Maintenance -** Maintain CPM lookup tables
- **Table Transaction View -** View Table Transactions. Adds, Edits, Deletes, etc.
- **Test Inventory Management -** Allows users to build/import Bill of Materials and assign/order CPM parts



- **Transaction View -** View/query an account's transactions, based on date and type of transaction.
- **Transfer -** Transfer a part between accounts (move across account borders)
- **Transferred Modify -** Allow modification of Transfer information for transferred parts
- **UnDestroy -** Return a Destroyed Part back into Inventory
- **View Parts Pending ADC Review -** View list of part numbers that have not been reviewed by an ADC