

Plug-in Spares Management for Tier 2 & Lower Carriers

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Tracking assets at the inventory location/Central Office level is crucial to solving Carriers' spares management problems. Alden understands that flexibility is the key to the effective and efficient solution of the maintenance spare issue.

Background

All Telecommunications companies have the inherent problem of managing movable assets, namely plug-ins, also referred to as blades, cards, boards, circuit boards and more. The capital expenditures and operating expenditures associated with these assets are a significant portion of a Carrier's budget.

The following data points govern the magnitude of the problem:

- The physical size of the network (number of central offices, access lines, etc.).
- The technologies deployed within the network (such as switches, Digital Loop Carrier, DSL banks, copper T1, Fiber backbone and distribution, WDM/DWDM, digital radio, digital TV, etc.).
- The existence or lack of a tracking tool for determining movement and utilization of the plug-in inventory.
- The utilization of min/max (spare) keep levels within the tracking tool and the enforcement of such levels in the inventory control function.
- The existence of and adherence to business processes relative to service activation and deactivation involving plug-ins.
- The existence of and adherence to business processes relative to capacity expansion as well as capacity retirement.
- The existence of and adherence to business processes relative to plug-in repair.
- The regular conduct of plug-in inventory audits both installed and spare.

Network Size

“Historically, commercial asset tracking systems specific to the telecom industry...are generally too expensive to be considered by Carriers with less than 50,000 access lines.”

Historically, commercial asset tracking systems specific to the telecom industry have been built and marketed for the larger Tier 1 Carriers, and are generally too expensive to be considered by Carriers with less than 50,000 access lines. On average, there are about 7,400 access lines per telephone company exchange in the US. Specifically, the Bell companies (BOCs) have about 12,000 lines per exchange, while the non-Bell Independent Companies (ICOs) have only about 3,000 lines per exchange. One can infer that any Carrier having less than 15 to 20 exchanges would find most commercial asset tracking systems to require an investment, both financial and non-financial, too large to justify in a business case. Therefore, such Carriers must forgo use of a plug tracking system or utilize a simple, in-house system that lacks the functionality to properly manage inventory levels in an effective manner.

Business Processes

The most common Carrier processes involving plug-ins are:

A. Replacement of a defective unit with a good spare

In order to maintain good service levels, a minimum quantity of spares should be maintained at each switching location. The maintenance of an efficient inventory level requires a complementary and effective replenishment process. The more effective the replenishment process, the greater the ability to utilize a lower spare. Best practices indicate that total maintenance spare levels at central offices should be in the range of 1% to 5% of total inventory. Maintaining such minimal inventory levels requires both an efficient tracking system and min/max level setting with enforcement that interacts with an auto-replenishment capability. Further, such a system should allow technicians to search other inventory locations for spare units when not available locally. Upon locating a needed unit, options for transporting spares from one location to another, whether pick up or shipment, should be available to initiate through the system functionality. In any case, once the replacement transaction is performed, the system should automatically update the location and status of the plug-ins involved while updating the appropriate corporate asset records (ERP or accounting system). As a tertiary function, the system should be capable of advance notification of the appropriate repair vendor and shipment processing related to the handling of a defective unit. The system should have the functionality to support ABR (Advance Board Replacement), repair and return, storage of defective units for bulk repair based on need, and junking or other disposition of the defective unit.

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B. Installation of a plug-in in conjunction with a Service Activation Order

Best practices dictate that spare plug-ins for service activation are not kept locally but stored and shipped from a central facility in conjunction

with a triggering service order. Forecasting should be used to determine both inventory levels and storage locations for spares in order to facilitate the service activation process as efficiently and effectively as possible. Such a tracking system would allow for use of a maintenance spare to expedite a service order, or in the case of an emergency, while accounting for the use of the plug in and the replenishment of the spare inventory subsequent to such use. Further, the system should have the capability of relating the completion of a specific service order to one or more shipments of one or more plug-ins, while tracking the status of the order through completion. Such tracking would require that the system have the capability to communicate and share data with the resident provisioning system.

C. Removal of a plug-in in conjunction with a Service De-activation Order

Best practices dictate that de-activated plug-ins should not be left in place within an active frame/slot except in extreme cases of high activity where the initiation and cessation of service is experienced daily. The system should be capable to track the existence and location of plug-ins left spare in the slot and account for them in the auto replenishment calculations. In instances where the resident technology plug transfer activity is at less than extreme levels, the associated plug-in should be removed from the frame if it is not in a working status. It should be scanned into the maintenance spare pool location or shipped back up the supply chain to the specified distribution center as indicated by the min/max requirements and as instructed by the plug management administrator.

D. Capacity Expansion Authorizations

The proper planning of capacity expansion projects should preclude the need to use existing maintenance spares stored on-site. Equipment required for such projects would normally be ordered directly from the manufacturer and shipped to a staging location or directly to the switching office or remote site. The tracking system should be capable of accepting advance notice of these projects and allow for the scanning of the shipment into a holding bin at the receiving location. As the project is being completed, the system should be updated to indicate current status of plug-ins installed and share such transactions with the materials management and engineering design system as work progresses. Best practices require the system track job completion due dates and initiate an alert process when a delay in the predetermined schedule has occurred. From that time on, the system should treat the associated plug-in shipment as an over-aged job and report on it until resolved.

E. Disposition of Excess Plug-ins

The system should have a resident process that periodically checks the on-hand quantities of plug-ins relative to the max levels set by the administrator. Such a process may be a part of the auto-replenishment process in some tracking systems. A report should automatically be

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generated that indicates the quantities and locations of equipment above the maximum spare value for the location with instructions as to the disposition of this excess. Normal dispositions would include: shipment to a warehouse or other distribution location in the supply chain to be used to fill other replenishment requirements, retirement in the case of obsolete and zero value plug-ins or shipment to an alternate location or vendor for a consignment sale of the identified plug-ins.

“Any action taken to address excess spares should minimize negative impact on both service levels and technician productivity.”

Keys to CAPEX and OPEX Savings

Spare inventories should be maintained at a level that represents between 1 and 5 percent of the total plug-ins in the network.

All excess spare plug-ins beyond the 5% target maximum should be addressed in the following ways:

1. Reuse excess to fill demand in the local network thereby reducing CAPEX.
2. Sell all usable excess beyond what is needed to fill internal demand. This can be accomplished either through a direct sale or through a consignment arrangement.
3. Implement a disposition process to retire and junk, as salvage, any excess plugs that are not reusable or sellable.
4. Ensure the proper updating of corporate asset records for depreciation and retirement to maximize tax savings.
5. Any action taken to address excess spares should minimize negative impact on both service levels and technician productivity. Such minimization requires the implementation of an asset tracking system specifically designed for telecom processes.

Stand-Alone versus Hosted Implementations

Larger Carriers with the volume and the IT infrastructure to support a robust tracking system would normally have an asset tracking/spares management system installed in their IT complex within the firewall for the exclusive use of the Carrier.

For smaller Carriers, a hosted environment would be recommended in order to reduce total deployment and maintenance costs for such a system. A hosted environment would also eliminate a majority of the Carrier's IT resource requirements, in terms of both personnel and hardware. As a result, startup cost would be more manageable. In the hosted environment, the

“LCAM® can be configured to source replenishment plug-ins...for optimal auto-replenishment.”

Carrier would be charged a monthly fee for each inventory location to be tracked, as they are activated and placed on-line within the system. In the future, any inventory location could be deactivated from the system upon the Carrier’s request.

- A. Alden Systems LCAM® (Life Cycle Asset Manager) has an automated mode for unmanned locations that can be configured for manned locations if the Carrier does not want to burden their CO Techs with the training and ongoing use of an inventory system. In such a configuration, technicians would be trained only in searching for and obtaining spares from other inventory locations.
- B. The automated mode requires integration with the Carrier’s provisioning system in order to determine when plug-ins are shipped to a location for completion of service orders and when a spare becomes available due to a service disconnect. When LCAM® sees a service activation order together with a plug-in shipment, it can automatically add it to the installed inventory if the Carrier chooses to track installed plug-ins. When LCAM® sees a service deactivation order involving a plug-in, it can automatically add the plug-in to the spares count at that office.
- C. Min/Max levels can be maintained and reports can be automatically issued on any excess buildup at any locations.
- D. In order to eliminate the need for tracking of plug-ins on loan, LCAM® can interface to the Carrier’s Asset Records to update the movement of plug-ins from one location to another, if desired. The cost for the integration would depend upon the complexity of the Carrier’s system.
- E. Any location can be switched to scanning mode for technicians to scan plug-in movement, if desired.
- F. Serial number tracking is available at the Carrier’s option and is configurable by location.
- G. Replenishment can be handled via reports or LCAM® can be integrated to various supply sources including Warehouses and distribution centers, vendor’s pre-owned inventory and hosted customer excess inventories.
- H. LCAM® can be configured to source the replenishment plug-ins in a configurable search sequence for optimal auto-replenishment.

Consignment Sales

Many Carriers participate in consignment sales of excess plug-ins with a repair vendor or an OEM. Alden offers an alternative solution. In the hosted environment, all data for each customer is securely

confined to that customer. However, Alden provides a means of excess inventory exposure whereby each Carrier can move excess inventory available for sale into a virtual public repository and any hosted customers can search for equipment available as excess from the repository. The equipment can be brokered through LCAM® and the selling customer will receive a significantly higher percentage of the sale than with traditional pre-owned sales brokered through vendors.

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Taking Spares Management to the Next Level

Once a system is in place and operating effectively as described in the above paragraphs, other features can be implemented to gain even more savings. Below is a listing of some of those features that can be incorporated into LCAM®.

PCN Management – Product Change Notice

OEMs issue product change notices of various classes. The Class A notice is the most critical and can be a safety hazard or potentially affect service in other ways. OEMs will provide free replacement equipment to their customers for this class of change notice provided the target plug-ins are identified and sent back to the OEM within a certain timeframe. This can be a very difficult task—from identifying the plug-ins location to actually doing the replacement. Free equipment opportunities that are missed due to the inability to identify and collect the target units can account for as much as tens of millions of dollars per year in larger Carriers.

Plug-in Demand Forecasting

Forecasting plug-in requirements will result in more accurate Min/Max levels and could reduce spare levels by a few more percentage points.

Stranded Assets

Virtually all Carriers have plug-ins in place and powered up with no service on them. In many cases, records indicate working traffic on a plug-in when there is actually no traffic on the card. In these cases, the plug-in could be recovered and added to the spares pool. Conversely, a plug-in may actually have traffic on it when records indicate there is none. In these cases, records could be updated and billing initiated for additional revenue. Alden Systems specializes in providing services to identify and correct these discrepancies.

RFID

In typical telephony environments, such as switches and transport systems, RFID is prohibited due to interference with the switch or transport systems as well as the inability to read an RFID tag while it is on a plug-in within a slot in a system. The environment that is conducive to RFID implementation is in the logistics area. RFID can be used to track the shipments of plug-ins back and forth between the supply chain and the CO as well as within trucks. RFID costs have been slowly coming down to the point where there is a reasonable ROI in these cases. Alden Systems can assess these situations and determine the viability of RFID for a Carrier’s specific situation.

Equipment Audits

Due to the nature of movable assets, it is a fact that a Carrier’s official asset

records will gradually creep more and more out of alignment with actual field conditions. Since the introduction of Sarbanes-Oxley, the importance of this situation has heightened. Alden Systems has been successfully providing services to Carriers across North America to audit Central Offices, Remote Terminals, Cell Sites and any other locations containing plug-ins and has been updating customers backend systems for decades

Conclusion

“Asset tracking at the inventory location/CO level is crucial to solving Carriers’ spares management problems.”

Asset tracking at the inventory location/CO level is crucial to solving Carriers’ spares management problems since the inventory location/CO is where the problem resides. Failure to address the issue at this level provides only a partial solution at best.

Removing excess from the inventory location/CO while failing to provide a tool for more efficient use of remaining spares would be detrimental to the Carrier’s desired level of productivity and customer service. Flexibility is the key to the effective and efficient solution of the maintenance spare issue. Alden Systems offers solutions that with the flexibility of functionality to provide the best plug management solution for the individual situation of each Carrier.

Sample Cost Impact of Poor Spares Management

Small Central Office

Installed Plug-ins 1500

Assuming average cost per Plug-in = \$100.00

% Spare	Spare	Value
5	79	\$ 7,900.00
10	167	\$ 16,700.00
15	265	\$ 26,500.00
20	375	\$ 37,500.00
25	500	\$ 50,000.00
30	643	\$ 64,300.00
35	808	\$ 80,800.00
40	1000	\$ 100,000.00
45	1228	\$ 122,800.00
50	1500	\$ 150,000.00

\$142,100.00 Overspend @ 50% Spare

Medium Central Office

Installed Plug-ins 3500

Assuming average cost per Plug-in = \$100.00

% Spare	Spare	Value
5	185	\$ 18,500.00
10	389	\$ 38,900.00
15	618	\$ 61,800.00
20	875	\$ 87,500.00
25	1167	\$ 116,700.00
30	1500	\$ 150,000.00
35	1885	\$ 188,500.00
40	2334	\$ 233,400.00
45	2864	\$ 286,400.00
50	3500	\$ 350,000.00

\$331,500.00 Overspend @
50% Spare

Large Central Office

Installed Plug-ins 8500

Assuming average cost per Plug-in = \$100.00

% Spare	Spare	Value
5	448	\$ 44,800.00
10	945	\$ 94,500.00
15	1500	\$ 150,000.00
20	2125	\$ 212,500.00
25	2834	\$ 283,400.00
30	3643	\$ 364,300.00
35	4577	\$ 457,700.00
40	5667	\$ 566,700.00
45	6955	\$ 695,500.00
50	8500	\$ 850,000.00

\$805,200.00 Overspend @
50% Spare

Learn More, Contact Us

If you would like more information regarding this white paper, please contact:

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