**Short repairs**

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Short repairs are an excellent way to improve productivity. The reason productivity improves is buried in the details of running any maintenance job including a PM. Think about the detailed steps that any maintenance worker takes to do any maintenance job:

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| --- |
| **Activity** |
| Get job assignment |
| Obtain Permit |
| Lock out tag out |
| Collect tools |
| Collect parts, materials |
| Travel to job with materials and tools (could be a few trips) |
| Quick safety walk down |
| **Perform work** |
| Clean up work area |
| Travel back to maintenance shop |
| Release permit, Unlock, return to operations |
| Return tools and excess materials |
| Do paperwork, work order, closing comments |

Notice that there are 13 activities and only 1 of which is productive in meeting your maintenance goals. Most maintenance professionals would agree that each of these activities is essential. They would also agree that as we go through planning, scheduling, training, maintenance reengineering we work to minimize the time for each step.

What is a short repair? In this sense, short repairs refer to repairs that can be done completely and properly in a short time (usually under 60 or 30 minutes) during a PM. Additionally the repair can be safely completed with the tools and materials that the PM person carries. Short repairs are to be written up for equipment history. The PM person does the job and writes the short repair on the bottom of the PM work order or on a Log Sheet.

Formally the short repair should be charged to CM (corrective maintenance). If that is impossible because of CMMS inflexibility then charging the short repair to PM is less desirable but still fine.

To facilitate this, equip the PM person (staff maintenance mechanic or contractor) with tools and materials for the most likely short jobs. How do you determine what to carry? Do a Pareto analysis (also known as the 80-20 rule) that states, roughly 80% of the effects come from 20% of the causes) of short repairs asking the question what are the few repairs that account for 80% of your short repairs? Equip your PM people for those repairs. You can also review the log sheets, have brainstorming sessions on the topic, and of course question your old-timers.

Building maintenance departments use a related concept called route maintenance. Route maintenance accumulates short repairs in a building or location. The route person visits each location periodically. You can improve efficiency by scheduling the same location on the same day of the week. The log sheet would be used to record these incidents. Frequently the quality of the maintenance department will be judged by the tenant/users by your effectiveness at short repairs.

One thing is clear. If we do a second or third planned job on the same asset we would add to the “perform work” time. Note that in some plants the scope of work on the permit has to be followed and if changed, the permit has to be reissued. But for anyone else an extra job done at the same time is extremely efficient.

This has been a scheduling trick or tip for years. In fact a Fleet Maintenance CMMS from the mid-1980s would not only check if there were open items against that unit, it would also see if there were any PMs were either due now or would be due in the next few days. Today when a job is scheduled for a particular asset the scheduler would have to manually review the backlog for that asset and see if he/she could tag another job along.

One of the best opportunities for these “short repairs” is during unit based PMs. A unit based PM is a typical PM where one machine is PMed from top to bottom. The tradesperson goes through all the steps above to complete his/her PM. Readers can step through the times for each activity in their own plant to see if there would be as much savings in their environment. We will attempt to answer the question what does it take to do a PM on any piece of equipment if the wrench time is 90 minutes?

|  |  |  |
| --- | --- | --- |
| Activity | Time for PM | Add in a 30 minute Short repair |
| Get job assignment | 10 | 10 |
| Obtain Permit | 40 | 40 |
| Lock out tag out | 20 | 20 |
| Collect tools | 15 | 15 |
| Collect parts, materials | 25 | 25 |
| Travel | 25 | 25 |
| Quick safety walk down | 10 | 10 |
| Perform work | 90 | 90 + 30 |
| Clean up work area | 10 | 15 |
| Travel back to maintenance shop | 20 | 20 |
| Release permit, Unlock, return to operations | 15 | 15 |
| Return tools and excess materials | 10 | 10 |
| Do paperwork, work order, closing comments | 10 | 15 |
| Total | 300 minutes | 340 minutes |

In the right hand column we added a 30 minute short repair. A few other fields do increase. We assume that job site cleanup and paperwork both increase slightly. The result:

The ratio of wrench time to all other time for PM only:

PM Only: Wrench time= 90 minutes / All time 300 minutes = 90/300 30%

The ratio of wrench time to all other time for PM with short repair:

PM + Short repair: Wrench time = 120 minutes / All time = 340 minutes = 120/340 35%

An improvement of 30% to 35% might not seem like much but it is 16% (just for allowing a single short repair during a PM). There are other advantages of having a short repair environment. One advantage is that the PM inspectors feel trusted and take greater ownership of the health of the equipment.

There are several disadvantages to short repairs that should be known and managed:

* The skill requirement for PM people for short repairs is significantly higher than for just PM
* Short repairs require significant judgment (so the short repair doesn’t turn into a long repair or isn’t too disruptive)
* One thing that you need to accept is that short repairs cause schedule disruptions

Since we want the PM inspector to be set-up for as many short repairs as possible we might consider a PM cart. Here is an example of the contents of a PM Cart for Building maintenance:

* Hand tools including: (screw driver set, pliers set, claw hammer, cutters, Allen wrenches, vice grips, key hole saw, hack saw, tape measure, utility knife, pipe wrenches, set of files, rasps, good flash light, batteries etc.), stepladder to reach ceilingElectric tools such as: electric drill and bits, drop light, Skil saw
* Cleaning tools (Straw broom, whisk broom, dust pan, trash bags, mop, wringer, bucket, rags, shovel, sponges, 5 gallon bucket, spray bottles, razor blade scraper, steel wool)
* Cleaning supplies (furniture polish, all-purpose cleaner with TSP, spray deodorizer, spray tile cleaner, wax, wax applicator, wax stripper, toilet bowl cleaner, oven cleaner, metal polish, non-abrasive cleanser), rags, paper towels
* Silicone spray lube, WD40, spray paints, spray zinc, standard off white latex paints (or standard colors) with brushes and rollers, joint compound, spackle knife, spackle tape, contact cement, latex and silicone caulk and gun,
* Variety packs of fasteners, variety of nails, small hardware items, duct tape
* Elect: light bulbs (ones you use), florescent replacement tubes, switches, outlets, switch, outlet & blank covers, electrical tape, fuses, fittings, outlet tester, neon tester, door hardware, lock sets, door bells, transformers, wire, smoke detectors, batteries, tags for writing dates of installation and testing
* Window hardware, floor and ceiling tiles, threshold and entrance strips
* Bug bombs, insecticide spray, can hornet/wasp killer, roach/ant traps
* Faucet washers and seats (seat tool), kitchen and bathroom faucets with flex lines
* Toilet parts, closet seals, toilet seat parts, closet snake

A cart in a factory would have small spares, tools and other items commonly needed. Different parts of the plant might need different carts.

Adding to the PM cart

* Each cart or each area has a Cart Inventory list. The cart should always carry these items. It is important that the last daily task is that the cart is replenished and cleaned.
* Study the maintenance log and the corrective work orders. Add items based on jobs requested.
* Periodically meet with the PM crews and discuss jobs completed and jobs that could not be completed. Adjust the cart based on these discussions.
* Allow the individual PM personnel to add things to the cart on their own. Again at the periodic meeting discuss the individual additions to see if they warrant adding to the cart inventory list.

The key to these carts is discipline. The tools and unused materials are put away into the same places, pockets, drawers, and cabinets each time. Care is taken to clean, lubricate, charge batteries, and generally care for the tools every PM day.

In conclusion Short Repairs are an excellent way to improve productivity and customer service.