

EXAMPLE 1

WORK SUMMARY

EST 319 INTERNSHIP

Week of July 29 to August 2

I. I worked a great deal on electrical safety inspections and PM's. As the other BMET's do their areas of expertise, more of the little things fall to me. My bench is by the door and I grab most of the incoming equipment that I'm familiar with and do what has to be done. I worked on the following equipment this week:

- Blood coagulators from surgery
- IVAC thermometers
- Mercury sphygmomanometers

Along with these devices I spent a lot of time in xray. I have taken an interest in xray and enjoy learning about it by watching and helping the BMET's whenever I can.

II. I learned that most problems associated with the use of blood coagulators in surgery are due to operator error and battery failure. Because the job they do puts them in contact with blood, they have a tendency to get fouled up with it. If the operators would do the prescribed maintenance on them, it would save a very unsavory job for the BMET. The biomed department is working on getting these devices off the electrical safety list because they are battery operated and have an isolated power supply.

I learned that most of the problems that happen to an IVAC thermometer deal with either the batteries getting old and not holding charges or the fuse blowing. Sometimes they come in broken from being dropped. To change the batteries or fuses the thermometer must be disassembled and the batteries or fuses have to be soldered in. When a thermometer is broken from being dropped, a new case can be installed.

Working with mercury sphygmomanometers has helped teach me about working with dangerous substances. A spill kit has to be on hand while adding or taking mercury out of the reading tube. The normal procedure would be to add or extract mercury in a ventilated hood that would catch any spills. This wasn't possible because it had never been hooked up, so any work with mercury would be done in a pan on the bench or in the sink. I was shown how to clean a sphygmomanometer without spilling the mercury by tilting it on its back so the mercury would flow back into its reservoir. I was also shown how to fill and remove mercury from a sphygmomanometer by removing the cap and using a syringe. I also had to rebuild one or two because they had been dropped or abused. It was not uncommon for a sphygmomanometer to show up in the shop with mercury in a plastic cup taped to it.

Week of August 5 to August 9

I. This week started by being back in xray working on the Optoplanomat. As I said in my last report this xray device is a dinosaur and seems to be broken down more than running. Parts are impossible to get and ingenuity and inventiveness have to be paramount to keep this piece of equipment running. It is up and running again but I do believe this one piece of xray equipment could keep one BMET busy full time. It kept me and another BMET (he did the hard work) busy for four days this week. The only other thing I did this week was to work on a motor-driven xray viewer. This is a piece of equipment that has a clear plastic belt that developed xray film can be attached to and observed in a sequential order by operating a foot pedal or pushing a hand switch on the console. It was fixed by cleaning dust

and dirt out of the circuitry and replacing a fuse.

II. The lesson that gets driven home here is that sometimes it doesn't matter what you think of some piece of equipment, or the amount of time and work that has to be spent on a piece of equipment to keep it running, the powers that be must be obeyed. Professionalism must sometimes be displayed by sticking to a job no matter what your personal thoughts may be about it and trying to make do with what you have. The reward may be accomplishing something that seemed impossible.

The second thing I learned or relearned was not to overlook the simple things. While working on the xray viewing machine I almost overlooked the simple blown fuse trying to find some complicated problem that didn't exist.

Week of August 12 to August 16.

I. This was another week in xray. The first three days saw buckey problems with the Picker Rapido. This is the xray that the VA uses primarily for orthopedics. The problems with it is that the motor that runs the film sizing and buckey positioning has problems with its rpm ratio reduction gear. It is a complicated arrangement of bearings and gears that run the positioning of the exposure tray. It seems to bind up after taking a few rays. This requires that the unit be shut down and the motor removed. Because of the busy schedule of this device we may have to tear into four or five times a day, delaying the scheduling of patients, but getting it to run enough to get through each day. The only way the problem is going to be solved seems to be to replace the motor. The last two days of the week were spent on the MCRT Xray Generator. This piece of equipment is a Topographic and Fluoroscopic xray. It is used for gastrointestinal rays. It was made by Siemens. Last month it was flooded by an overflowing toilet on the floor above it and after being dried out and rebuilt by a Siemen service representative, it has experienced intermittent operating problems. The problem is was having dealt with a servo motor used to unlatch the catch that let the columnator be adjusted. The techs that worked on it first tried to undo the bolts that held the catch mechanism to the wall of columnator housing. But instead of being able to get the catch out, it made it impossible to get it out. When my partner was called in to see what he could come up with to disengage the positioning catch, the first crew had been working on the problem for two days. With scraped knuckles and by shaking and manhandling, he and I finally got the positioning catch unlatched so the columnator could be removed from its housing and the adjustment catch could be reattached.

II. The lessons I gained from working on the Rapido is that the patient is important and must be considered when working on and fixing medical equipment, especially in the hospital I'm in. As a regional VA hospital patients may come from hundreds of miles for a test or medical procedure. Another thing I have learned from this job is that half the time spent on some jobs may be reading the service manual trying to trace or understand what is happening or trying to give yourself a starting place to work from.

The lesson learned from working on the MCRT xray generator is that you should have some idea what you're doing. If you act hastily or carelessly you can easily create a situation where you can damage expensive equipment.

Week of August 19 to August 23

I. I spent this whole week in surgery. In order to get to the equipment that had to have scheduled maintenance and electrical safety inspections a shift change had to be implemented. We would go in at noon and quit at 8:30 p.m. The hospital takes on a different perspective when it isn't busy. The first task in surgery was to work on the xray/fluoroscopy unit in the Cysto surgery suite. The table leveling control had been bent because of over rotation by the physicians. This caused a light sensing switch to

fail. This was repaired by removing a curved metal guide with notches in it and straightening it. A light sensing position switch would ride along the top side of the guide and when it sensed an LED that rode on the bottom side of the guide through the notches it would position the operating table according to what was needed by the physician. When this had been completed we were required to fine tune the picture on the fluoroscope monitor. This had to be done by removing the case around the TV camera and adjusting potentiometer mounted on the camera. Later that day and throughout the rest of the week our time was spent hunting for and doing PM's on the assigned equipment we could find. I don't get scheduled maintenance but spend quite a bit of time helping the other BMET's do theirs. The surgical PM's included equipment found in the surgical rooms, recovery rooms, storage rooms, and surgical intensive care unit.

II. I learned how to do PM's in a surgical environment. Some of the equipment that I helped to PM's on were:

- Blood Warmers
- Ventilators
- Anesthesia Machines
- Isolated Power Supply Stations
- Automatic Blood Pressure Units
- Oximeters
- Bedside Monitors with ECG
- Pac 6 and Pac 8 Defibrillator/ECG Monitors

Another thing I learned while doing PM's in surgery was that at times you have to plan very carefully if you want to successfully utilize the available time you have.

Week of August 26 to August 30

I. This week was basically benchwork and incoming equipment inspections. Monday was an incoming inspection on lab equipment for research and development section. The equipment that was delivered was on the invoice but the purchase order numbers didn't match. Supply had to come and pick the order up and return it to the supply room until they could straighten out the discrepancy. A call came that the Rapido unit was malfunctioning again. It has to be looked at and the same problem occurred at least once. Radiology is a very busy department and has a tendency to panic at the least sign of trouble. I found by shutting the machine off for a second it would usually reset the problem and the machine could stay in service and be used. No other solution was feasible unless the machine was taken out of service and a new part was ordered. On Tuesday I had to put a new transformer into a Sigma 6000 infusion pump. It was a three hour job and very close work. The afternoon saw the delivery of equipment for the surgical department. The equipment turned out to be fiberoptic scopes of different sizes for different uses. When a scope comes in it has to be taken to the decontamination room in the Supply, Procurement and Disbursements department and connected to a pressure tester and submerged in water to check for any leaks. After this is done then they are released to the department they were meant for and sent back to SPD to be put back on the same machine to be sterilized before use. Wednesday saw another trip to radiology to repair the Rapido. It had just been badly maintained by the radiation techs and needed to be emptied and cleaned. A dirty job that can usually fill up a morning, and it did. The rest of the week saw me working on a VCR and replacing a fuse, adjusting shelves on an equipment cart so that it could hold equipment it was not designed to hold, checking in some new 386 computers and adding RAM memory to their mother boards, trying to fix a leak in a film developer room that I found was condensation off of the air conditioner coils.

II. I learned this week that the confidence to do the best job you can comes with the opportunity to get experience. Every day I see some new medical device or equipment that I have never seen before. At

least now I have an idea where to go find what it does and what is used for. I've learned that by asking the right questions or looking the right place for information on something that most puzzles can be solved. I've also learned that the necessity of documentation and paperwork, though time consuming and tedious, can save time and money in the long run.