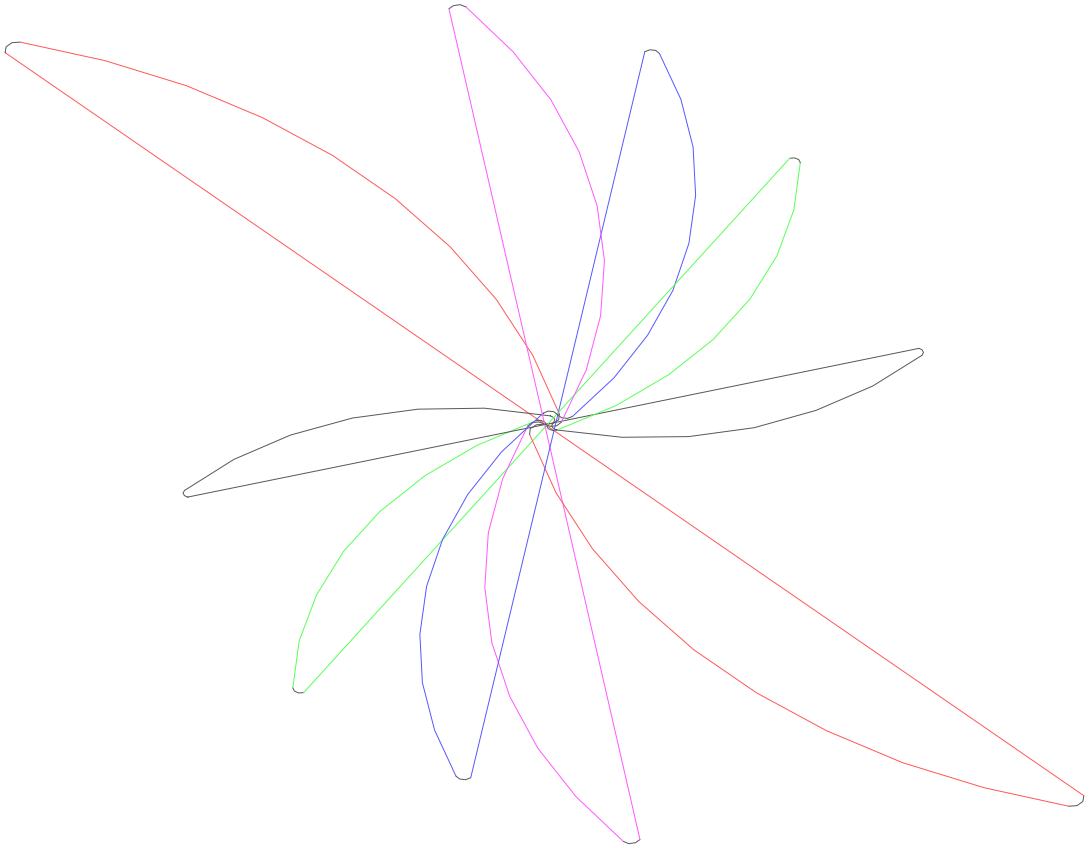
# Magnetec Inspection, Inc.
# Employee Handbook



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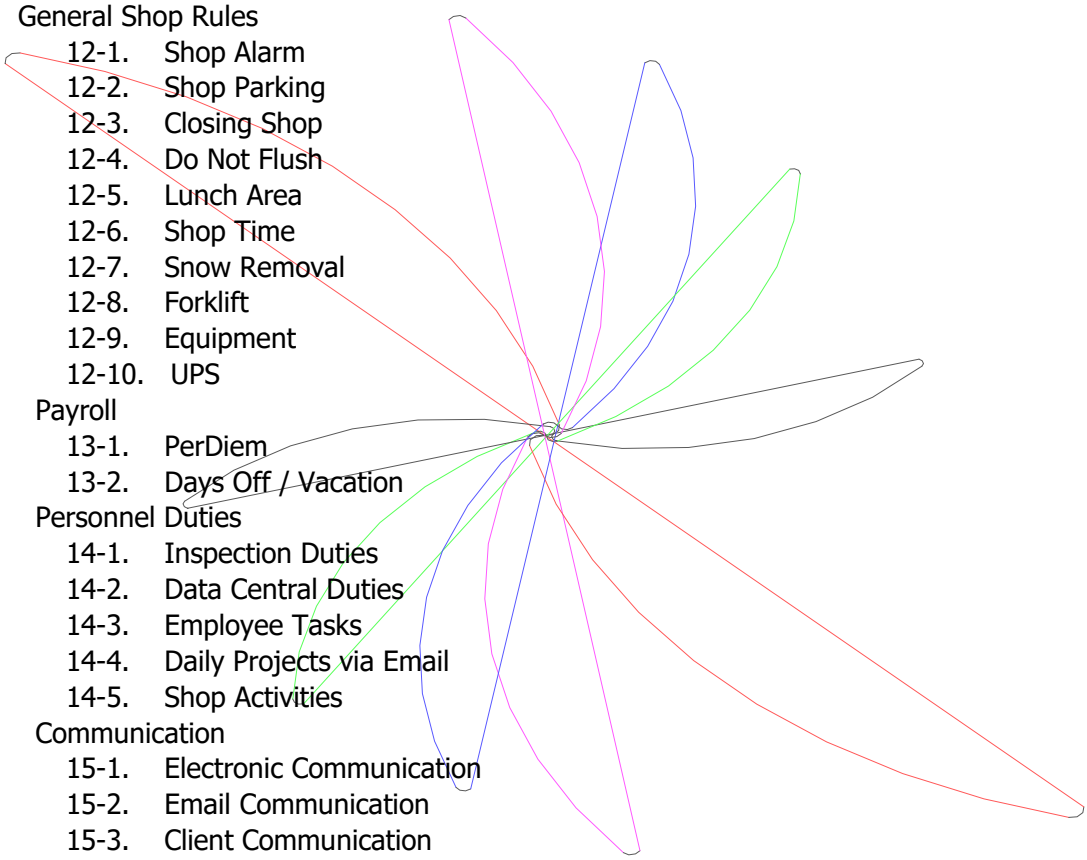

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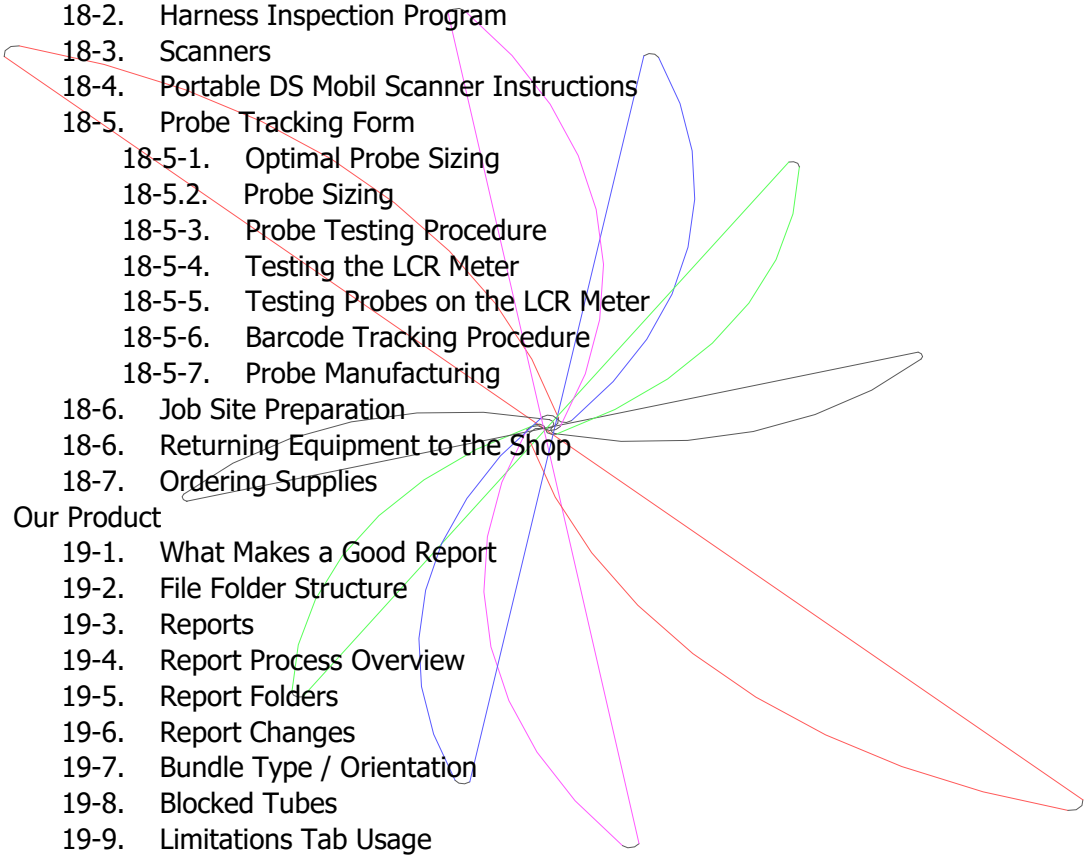

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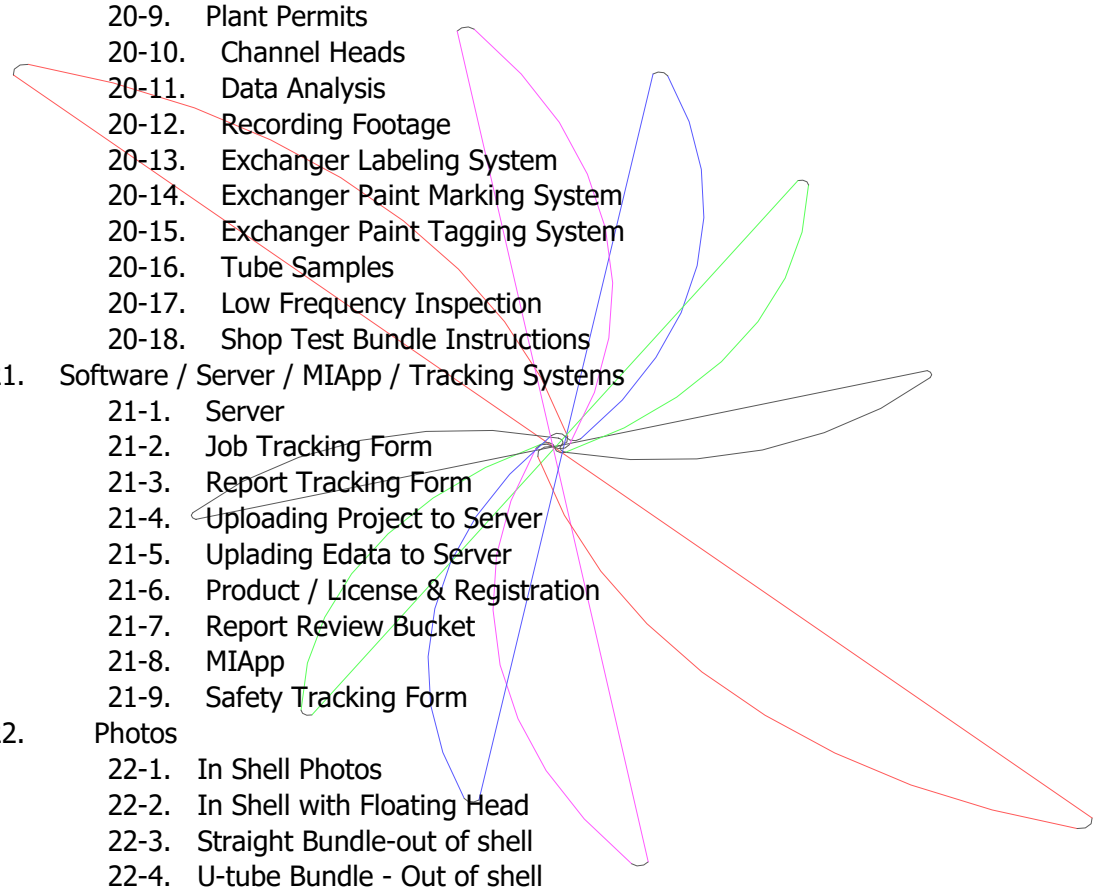
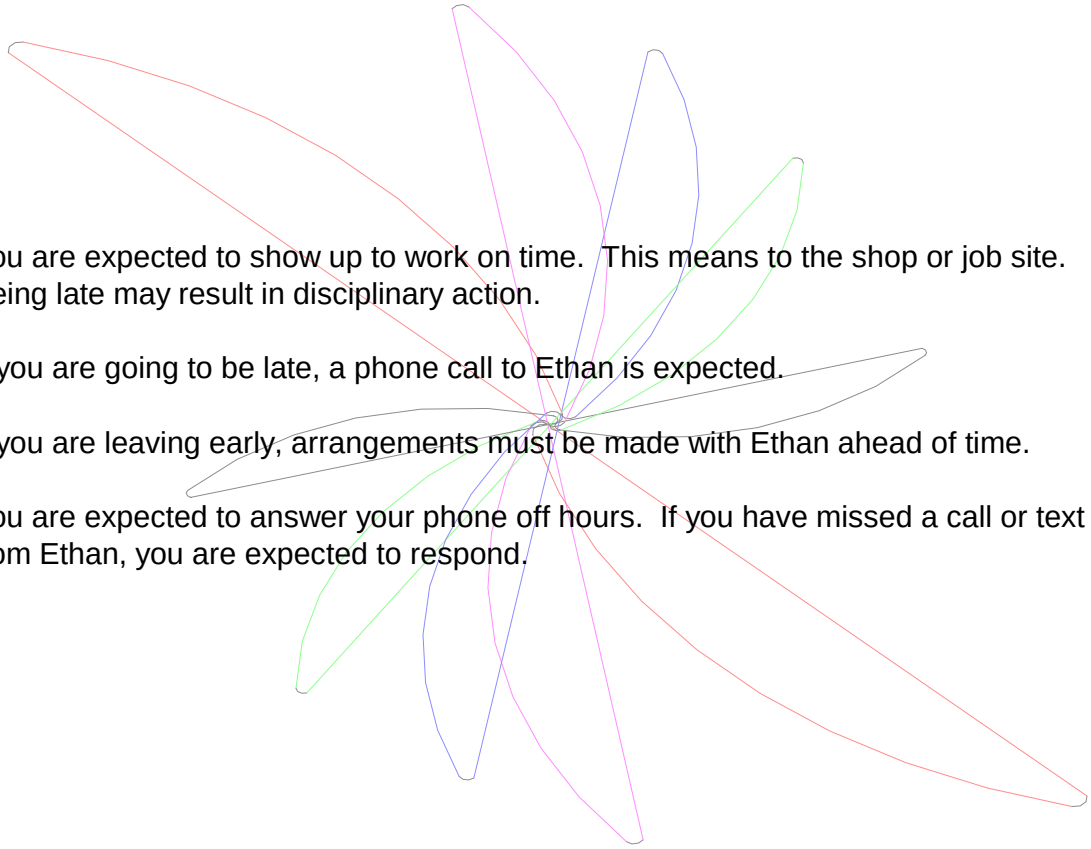


Section 1

# ATTENDANCE



You are expected to show up to work on time.  This means to the shop or job site. Being late may result in disciplinary action.

If you are going to be late, a phone call to Ethan is expected.

If you are leaving early, arrangements must be made with Ethan ahead of time.

You are expected to answer your phone off hours.  If you have missed a call or text from Ethan, you are expected to respond.

# Anti-Discrimination and Anti-Harassment Policy

Magnetec Inspection, Inc. will not condone, permit or tolerate any form of discrimination and / or harassment by or against any employee, customer, vendor, independent contractor or other individual with whom our employees come into contact during their employment with Magnetec based upon age, race, color, creed, religion, sex, sexual orientation, national origin, disability or other protected class or characteristic established under applicable federal, state or local statue or ordinance.

This policy will be enforced at all times, in all locations, at all work sites and at all job related meetings, gatherings, outings, etc.

Sexual harassment is a form of illegal sex discrimination. Sexual harassment refers to behavior that is unwelcome, personally offensive, and which interferes with our work effectiveness. Federal law defines unlawful sexual harassment as unwelcome sexual advances, requests for sexual favors and other verbal or physical conduct of a sexual nature, whether by male or female, when (1) submission to such conduct is made either explicitly or implicitly a term or condition of an individual's, employment, (2) submission to or rejection of such conduct by an individual is used as a basis for employment decisions affecting such individual, or (3) such conduct has the purpose or effect of unreasonably interfering with an individual work performance or creating an intimidating, hostile or offensive work environment.

Individuals who believe they have been subjected to discrimination or harassment as described or have questions about whether certain conduct is unlawful should immediately speak to their supervisor or Ethan Williams. This is particularly important in cases involving sexual harassment where there can be uncertainly about what is unlawful conduct.

Supervisors who receive complaints of discrimination or harassment or who are made aware of conduct that may constitute discriminations or harassment must immediately notify Ethan Williams (or, if appropriate Michelle Eaker, in place of Ethan Williams).

Any complaint will be handled with the utmost confidentiality.

All complaints will be investigated promptly and the existence of a complaint will be disclosed only to the extent necessary to make a prompt and thorough investigation or to take appropriate corrective measures. In all cases, the person who initiated the complaint will be informed of the findings and disposition of the matter at the conclusion of the investigation. Management will ensure that there is no coercion, retaliation, intimidation, discrimination or harassment directed against any individual who registers a complaint or serves as a witness on behalf of another individual.

This policy also pertains to all forms of communication including signage, oral communication, published materials, video, audio transmissions, email transmissions, website usage, telecommunications and texts.

***PERSONS WHO ENGAGE IN PROHIBITED DISCRIMINATION OR HARASSMENT WILL BE SUBJECT TO APPROPRIATE DISCIPLINE UP TO AND INCLUDING TERMINATION OF EMPLOYMENT.***

# Code of Conduct

The following is to be considered our/your code of conduct with respect to other employees and clients.

Certainly as we go from job to job and there are interactions with others and there may be times where a code of conduct may be required. The code of conduct/ethics would be considered mandatory at all times while performing work for Magnetec either directly or indirectly. This could include your personal life as it may interact with your daily work requirements.

Many of the below listed specifics are covered by and adopted by the US government and most state, county and local judicial centers. Some aspects of these are:

Sexual harassment
Religious harassment
Political harassment
Discrimination - Sexual, race, color, religious, political, economic, handicap, etc.

Below we will address a few.

1) Sexual harassment - you will not sexually harass a fellow employee. This would include any time while on/off the clock. This would include but is not limited to the following:

Conversations/discussions which are leading, suggestive, questioning, joking, or manipulative.
Gestures which may have sexual overtones, improper touching, physical contact, etc.
Sexually related jokes, gender specific connotations, etc.

At all times conduct will be in a professional manner without regard to opposite gender. You will treat everyone as a gender neutral employee.

Consider this rule as a deal breaker with regard to your employment.

2) Religious or political harassment - You will not harass your fellow employee with regard to religious/political affiliation or beliefs.

This includes but is not limited to the following:

Conversations/discussions with regard to basic religious/political beliefs.
Making, passing, or telling disruptive jokes or stories with intent of hurt to others.

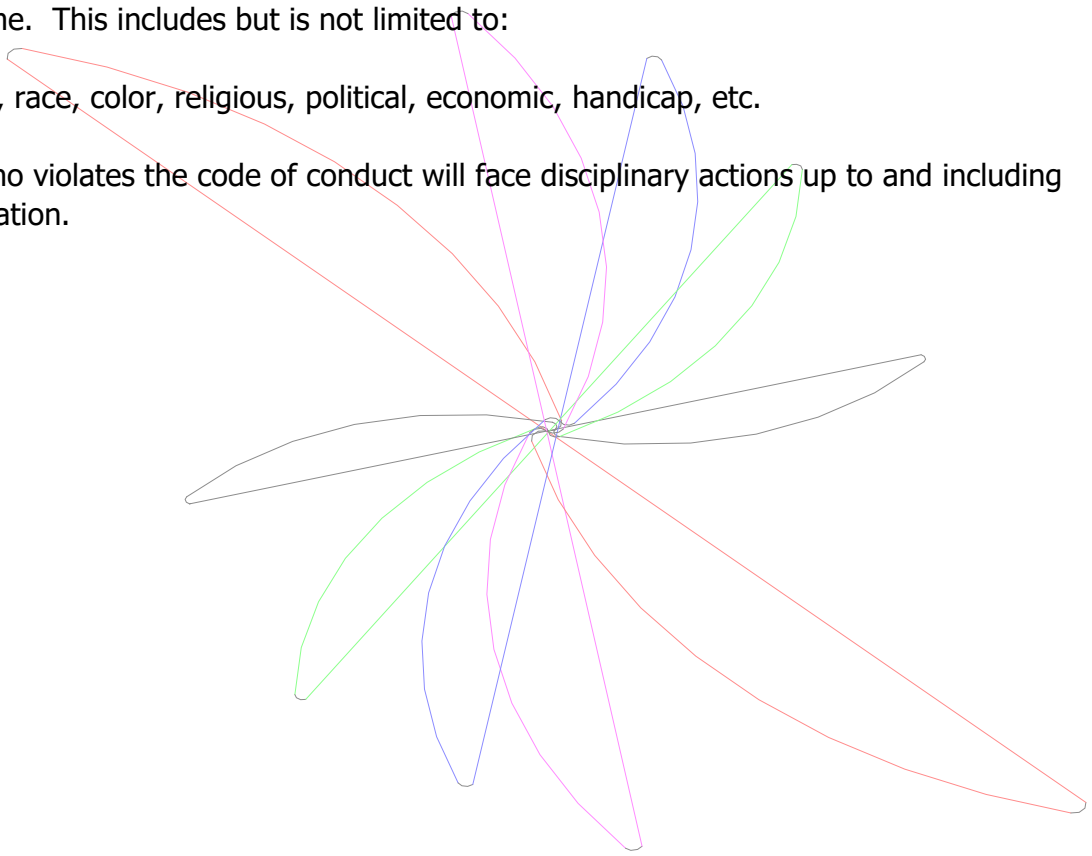
3) Professionalism - You are to act in a professional manner to all other employees. This would include but is not limited to:

Inter-personal demeanor with others
Personal attacks

***Code of Conduct continued:***

Anger
Disruptive behavior to others
Ridicule
Placement of blame

4)Discrimination - No one is to discriminate against any other employee, client, vendor, etc. at any time. This includes but is not limited to:



Sexual, race, color, religious, political, economic, handicap, etc.

Any who violates the code of conduct will face disciplinary actions up to and including termination.

# Disciplinary Action

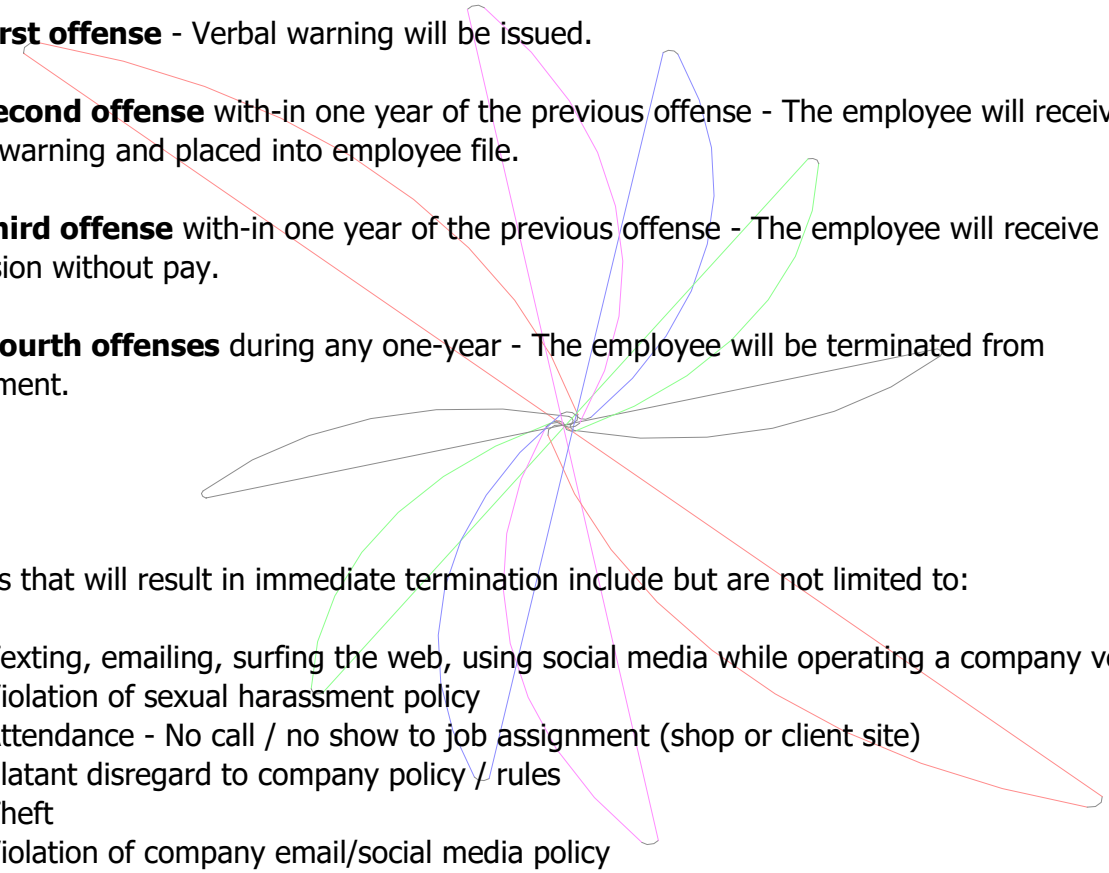
Any employee who violates procedures will be disciplined. The discipline will include a review of the regulation or rule violated and the corrective action to be taken. The following methods describe the process for enforcement of disciplinary procedures. The severity of the violation may require that steps may be skipped and termination may be the corrective action taken on First Offense.

**First offense** - Verbal warning will be issued.

**Second offense** with-in one year of the previous offense - The employee will receive written warning and placed into employee file.

**Third offense** with-in one year of the previous offense - The employee will receive 3 days suspension without pay.

**Fourth offenses** during any one-year - The employee will be terminated from employment.



Offenses that will result in immediate termination include but are not limited to:

-Texting, emailing, surfing the web, using social media while operating a company vehicle
-Violation of sexual harassment policy
-Attendance - No call / no show to job assignment (shop or client site)
-Blatant disregard to company policy / rules
-Theft
-Violation of company email/social media policy
-Under the influence while operating a company vehicle
-Intentionally causing damage to company property

# Communication Policy

1) If you are on the payroll for any day you will call in to Ethan at either 10:00am or 2:00pm to communicate such information as job progress, problems, equipment needs, issues, etc...

Assumably there will be a better time than others to phone in and times could shift somewhat.

If call is not answered leave a message. Note: if you call and there is no answer leave a message.
There are many times that if no message is left the call is not considered urgent and Ethan will wait until after that days shift to complete the call. If it is urgent leave a message.

2) If you are a member of a larger crew the phone in duty will be covered by the job lead. ("lead" is person who is in charge of the specific job and is the primary information path from Magnetec to the plant personnel.)

Our whole job is based around communication with the plant personnel and our own employees.

You need to talk/discuss/communicate with everyone associated with a job task.

This obviously includes the plant, our people, outside vendors, etc..

What Goes to Ethan

1) You need to forward all information from clients to Ethan. This includes but is not limited to: jobs, problems, questions, cost, technical information, industry info, safety concerns, etc.

2) Any aspect of the company that affects either clients and/or company (Magnetec) personnel need to be forwarded to Ethan. (Verbal and/or E-mail correspondence)

3) If you have individual concerns that affect the company they need to be forwarded to Ethan.

Ethan expects to know all specifics that effect the company. You must forward all correspondence.

If/when you call Ethan you will leave a detailed message with regard to the call.

Ethan will respond to a call when time permits.

If there has been a death, accident, IRS notice, etc. you may text Ethan with 911.

If you call and do not leave a message Ethan will assume there was no real need for the call and will not return the call.

Ethan will be kept in every loop of the company operations and communication.

The following info will be directed to Ethan:

1) Inter-company communication
2) Client/Customer communication
3) Vender communication
4) Supplier communication
5) Extraneous service communication
6) Employee communication

This basically means if you in any way discuss, text, E-mail, call, send letter, etc. any information which impacts the company in any way Ethan will need to be contacted. (E-mail it)

Assume the following:

EVERY E-MAIL YOU SEND WILL HAVE ETHAN ATTACHED. DO NOT SEND ANY COMPANY CORRESPONDENCE TO ANYONE THAT DOES NOT HAVE ETHAN ATTACHED.

EVERY E-MAIL WILL GO TO TWO PEOPLE - The recipient and Ethan.

# NON-DOT Drug and Alcohol Policy

Magnetec Inspection, Inc. requires all potential employees to be urine drug tested, breath alcohol tested and hair tested prior to employment. Magnetec Inspection, Inc. utilizes a third party administrator (DISA) to analyze and post results of drug testing. All potential employees must pass all parts of the drug and alcohol tests to be considered for employment.

Magnetec Inspection, Inc. through DISA requires random drug and alcohol testing as well as yearly hair testing. All employees must go, within the specified time period, after receiving notification that they have been randomly selected, to an approved collection site with the paperwork provided to them to take the random tests.

All Magnetec Inspection, Inc. employees are subject to reasonable cause testing as well. Any employee believed to be under the influence or is exhibiting any type of behavior that is out of the ordinary (including but not limited to slurring, lack of coordination, drowsiness, extreme excitability, profuse sweating in an inappropriate environment etc.) will be escorted to a collection site by a supervisor or other competent employee to take a drug and alcohol test.

Any Magnetec Inspection, Inc. employee involved in a work related accident will be subject to a drug and alcohol test.

At any time, if a Magnetec Inspection, Inc. employee does not receive an acceptable drug test and/or alcohol test, the employee will not be allowed to work or perform any other function at any client/host sites. DISA will require the employee to complete several different return to work steps before they can be retested and returned to the drug and alcohol program. The employee may not return to a client/host site until all DISA mandated return to work clauses have been satisfied. The employee will be responsible for all costs associated with return to work programs.

Employees are expected to have drug/alcohol/hair testing forms with them at all times.

Employees may request, at any time, copies of their results. Requests should be submitted to Michelle Eaker.

# Professionalism

As a Magnetec Inspection, Inc. employee, you are expected to act as a professional at all times.

This means you not engage in any kind of horseplay while on the job site.

You will not fight verbally or physically with any other person.

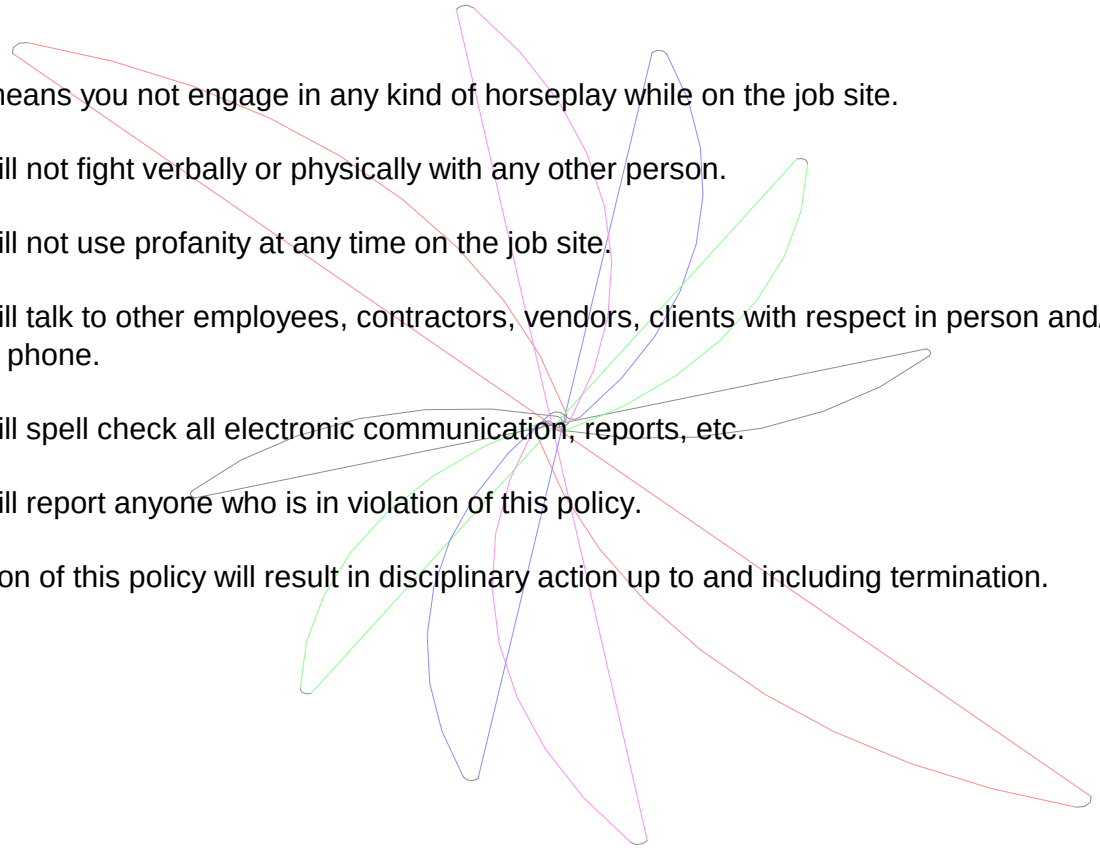
You will not use profanity at any time on the job site.

You will talk to other employees, contractors, vendors, clients with respect in person and/or on the phone.

You will spell check all electronic communication, reports, etc.

You will report anyone who is in violation of this policy.

Violation of this policy will result in disciplinary action up to and including termination.



# Smoking Policy

We understand there are many smokers among the personnel. Among the personnel there are an equal number of non-smokers.

We wish to accommodate all of the company personnel and will forward the following guidelines:

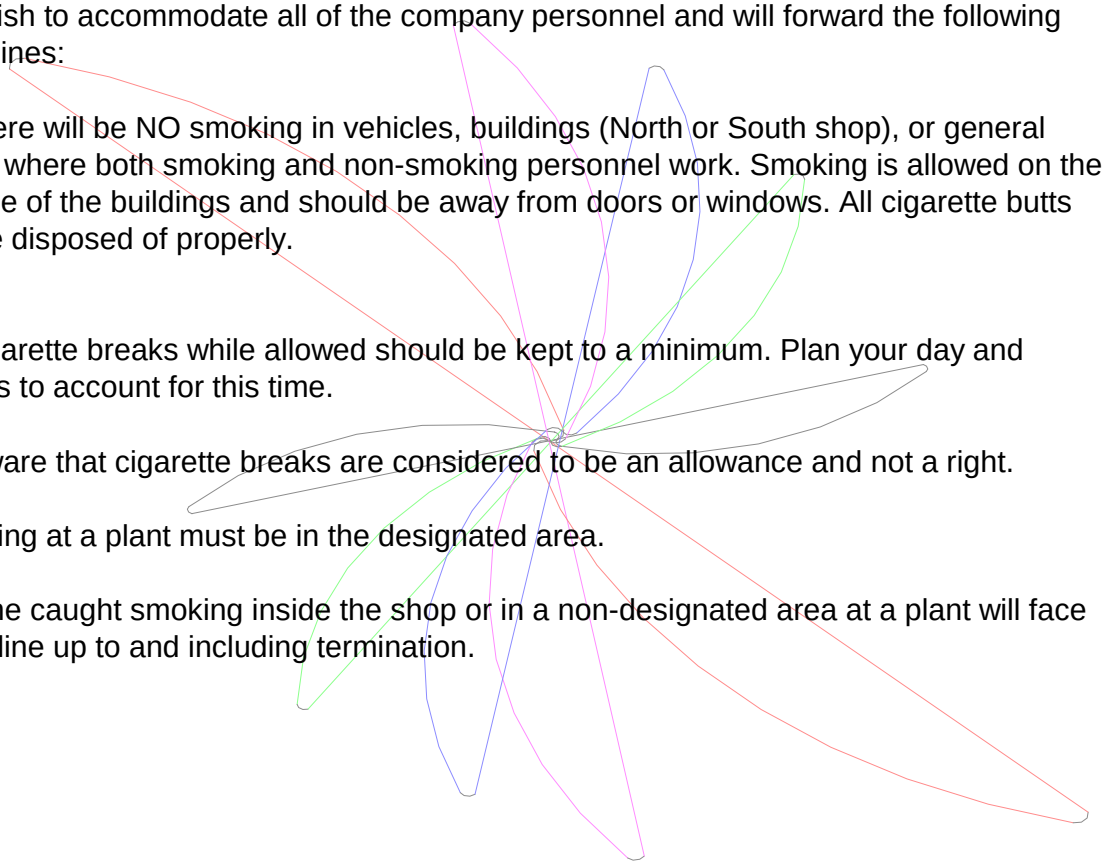
1) There will be NO smoking in vehicles, buildings (North or South shop), or general areas where both smoking and non-smoking personnel work. Smoking is allowed on the outside of the buildings and should be away from doors or windows. All cigarette butts will be disposed of properly.

2) Cigarette breaks while allowed should be kept to a minimum. Plan your day and breaks to account for this time.

Be aware that cigarette breaks are considered to be an allowance and not a right.

Smoking at a plant must be in the designated area.

Anyone caught smoking inside the shop or in a non-designated area at a plant will face discipline up to and including termination.

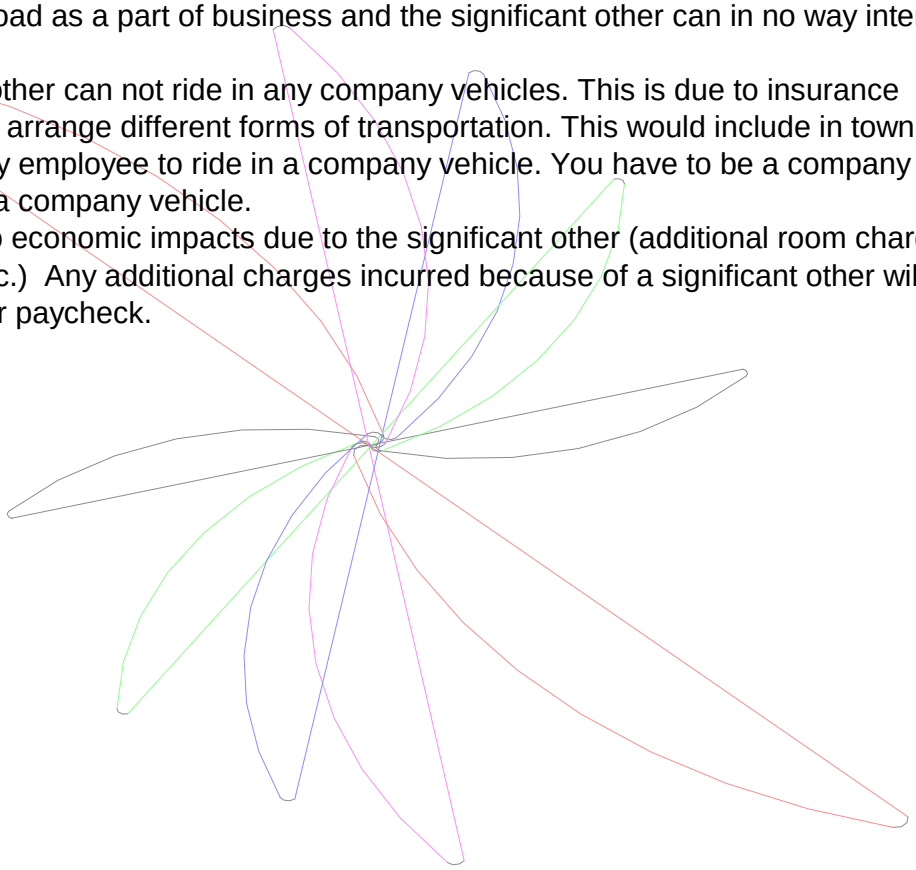


# Significant Others

There is always a desire to bring your significant other on the road with you.

We do have certain criteria that must be adhered to.

1) We are on the road as a part of business and the significant other can in no way interfere with your duties.
2) The significant other can not ride in any company vehicles. This is due to insurance reasons. You must arrange different forms of transportation. This would include in town. You must be a company employee to ride in a company vehicle. You have to be a company employee to drive a company vehicle.
3) There can be no economic impacts due to the significant other (additional room charges, charging meals, etc.) Any additional charges incurred because of a significant other will be deducted from your paycheck.



# Traveling

There have been a number of recent jobs over the last year where there were immediate jobs which required traveling on a moments notice. This usually occurs very randomly and while a pain it is necessary for our clients.

When these situations occur you need to make immediate arrangements and get on the road.

" Why do we leave so early"  - Well here is the answer.

1) If a client is expecting us we need to be there - You never know when a breakdown, flat tire, etc.. may occur and this could slow you down by hours or even day(s). If you leave early you have a chance of getting a repair (the shops will be open, they can get parts, etc) and getting back on road.

2) The job may by pushed up and the client needs us there NOW. Never, ever assume that the negotiated start time is correct.

3) Weather conditions are more easily negotiated during the day. Black ice is black because pavement is black and you have decided to travel at night. So - Black pavement + Night = Ditch.

You can assume that when asked, you travel at the discussed hours. This is not negotiated by you.

We will never do the - Well I will get dinner with the better half, get a couple hours sleep and take off at 1:00 in the morning.

You will be directed when to travel and you will travel at this time. Of course the job lead has the say to this timing.

# Driving Safety

Magnetec Inspection, Inc. utilizes company vehicles for travel to and from our job sites. In order to drive a company vehicle, all employees must have a current and valid driver's license. All drivers shall be properly assessed, licensed and trained to operate the company vehicle.

The company owned vehicle shall be used for its intended purpose only and shall not be used for any personal reasons. Loads shall be secure and shall not exceed the manufacturer's specifications and legal limits for the vehicle.

Only Magnetec Inspection, Inc. employees are authorized to drive a company owned vehicle. Only employees of Magnetec Inspection, Inc. are to be a passenger in a company vehicle.

Magnetec Inspection, Inc. does not permit authorized drivers to operate company owned vehicles and text, surf the internet, watch videos or movies or read email while the vehicle is in motion. Any employee found violating this policy will be immediately terminated.

Magnetec Inspection, Inc. does not condone any employees driving and operating a cell phone without a hands free device. Additionally, no phones shall be used in construction zones or school zones.

All authorized Magnetec Inspection Inc. employees who operate company vehicles will follow safe driving practices. All drivers and passengers in company owned vehicles will wear seatbelts when the vehicle is in motion. Any authorized employee that operates a company vehicle will follow the rules of the road. This includes but is not limited to following the posted speed limit, keeping a safe following distance, obeying all posted signs and traffic signals and maintaining a safe driving speed during inclement weather.

Authorized drivers shall not operate a motor vehicle while under the influence of alcohol, illegal drugs, prescription drugs or over-the-counter medications that might impair driving skills. Any employee caught operating a company owned vehicle that is found to be under the influence of alcohol, illegal drugs, prescription drugs or over-the-counter medications will face immediate discipline up to and including termination.

Authorized drivers will report any collision or traffic violation while operating on company duties to the appropriate personnel.

All company owned vehicles will be maintained in safe working order. This includes but is not limited to oil changes, tire rotation and replacement, fluid top offs, etc.

All company owned vehicles are expected to be returned to the shop clean.

# General Shop Rules

Washing Vehicles

Please do not use a tire spray (most notably Armor all) to give them that shine while on the black top at the shop. We have recently sealed the pavement and this product along with others will melt into the sealant. In addition do not paint on the pavement assuming that the over spray is completely caught by the cardboard you have put down.

If you feel the need to shine the tires do it at the car wash.

You CAN wash a truck at the end of the building.

That is the only place it can be done (there is a hose and drain handy) and this must be for the Winter as well.
You CANNOT wash any vehicle inside the back shop there EVER. It must stay outside.

Shop Stock

The stock items at the shop (computers, archos, H2S monitors, coveralls, hard hats, safety harness, scopes, etc..) are not an item you may simply pack into your rig or make a carry along item. These have to be requested and tracked. This would mean you need to make a request and forward an E-mail to Ethan.

Items such as tape, rubber gloves, markers, safety glass's, etc.. may be stocked into your rig as they are depleted.

You may have noticed that almost every item that is a supply item from a computer battery to batteries to the red wire has multiple supply back ups. We do this so that a supply item is available at any time it may be required.

A shop has to have these backups so the day in/day out operations can keep running.

You can not simply use the last of an item and walk away. When you need to cut a piece of steel and the last backup blade is now dull, no one ordered replacements, and there is no replacement then the job comes to a halt.

You will assume that all items have a backup, if/when you use the last item you need to make an inquiry as to the replacement status.

Your eyes and cognition need to be open to what you are doing, so you need to first look at the supply prior to starting your project so you know that you will need to replete the supply when you complete the project.

A project to be completed well, needs a full understanding of the requirements of the project and the amount of the supplies required which will certainly cue you into the fact that no supplies will remain after words.

Many of our items (like the red wire) have many weeks of lead time and not having a supply is not an option.

We need to be making replacement orders in advance of the use of the last of a supply item. When you see 1/2 or 1/3 of a roll of wire you need to ask yourself the question. If you do not personally know the answer (e.g. The order should be in this week because I placed it last week) then ask someone who does.

From this point forward if you are using a supply and you use the last amount you will need to check on any remaining supply.

Shop Time and Projects

You should assume that you are always working on some form of project at the shop and if you find yourself with no project or at the end of a project you need to come find me and ask for guidance. As you enter the shop in the morning and become situated you should have a defined direction and be on the job within 15 mins. of entering the shop.

If you are not directly part of a project then you do not need to have input to the project unless asked. We do not need an employee to stand and watch another employee perform a task. Example: If one employee is working on a wiring project we do not need another standing there watching as if they are doing anything. Most are fully capable in working through and completing a task.

In addition the group think is not needed for a project. What is group think? When an idea/project is discussed and all nearby employees feel the need to jump in with their thoughts. Now if it was a brainstorm session or you were asked directly then sure, jump in. You can assume that most every project/discussion has been fully thought out and your input information may have already been weighed.

If you find yourself looking at a computer screen and a program is not working, do not sit there for hours wondering what to do. Ask someone if your equipment, computer, programs do not work after the third try.

Every employee from the shop and individual home locations (if you work from home) needs to spend time on their scope, software, archos, reports, learning, etc..
You are expected to fully understand every part, component, dialog box, report nuance, etc..
You need to practice every day on some aspect of the job we actually do. Inspect.

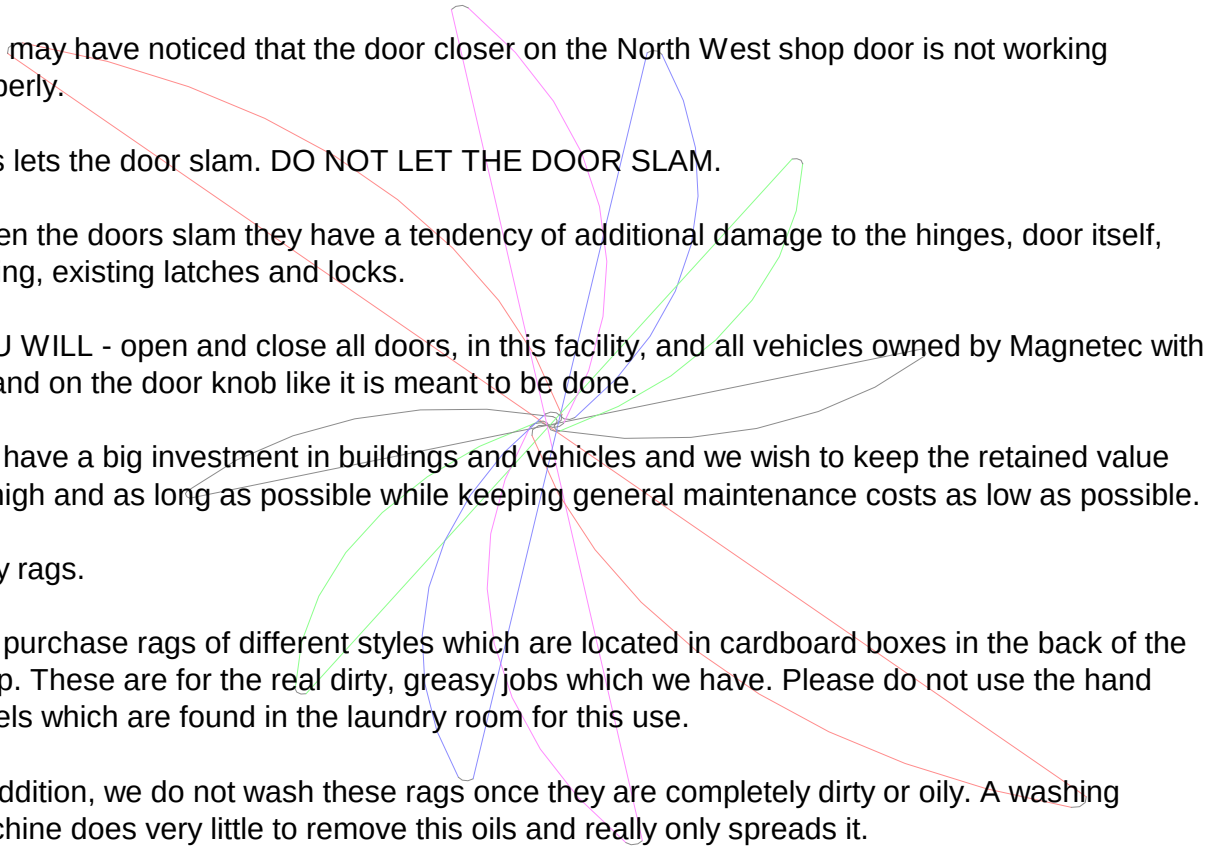
Your time and the company funding that is paid to you for this time is a capital investment and as such needs to be used wisely. The time that the company has paid you for needs to be put to the best use.

You can assume that you always have some form of project if your apparent work is complete. Clean some windows, organize the probes, re-review the reports, reconcile the files, re-pack your rig, sweep the floor, etc.

You may assume that your time within the shop is completely filled with projects. This would include all personnel within the building.

You will always have some form of project which advances the company forward. From the point you enter the building you will have a path forward through some form of project. If you find yourself in question of your next step you will inform Ethan.

Doors at shop



You may have noticed that the door closer on the North West shop door is not working properly.

This lets the door slam. DO NOT LET THE DOOR SLAM.

When the doors slam they have a tendency of additional damage to the hinges, door itself, casing, existing latches and locks.

YOU WILL - open and close all doors, in this facility, and all vehicles owned by Magnetec with a hand on the door knob like it is meant to be done.

We have a big investment in buildings and vehicles and we wish to keep the retained value as high and as long as possible while keeping general maintenance costs as low as possible.

Dirty rags.

We purchase rags of different styles which are located in cardboard boxes in the back of the shop. These are for the real dirty, greasy jobs which we have. Please do not use the hand towels which are found in the laundry room for this use.

In addition, we do not wash these rags once they are completely dirty or oily. A washing machine does very little to remove this oils and really only spreads it.

Washing oily rags with clean laundry only turns the whole load oily.

Please do not wash (washer) the rags which have been used to clean probes, mop up oils and grease, heavy dirt, gasoline, etc..

We purchase boxes of rags just for this purpose. The amount we use in a year for this purpose is very small and not a big cost.

Please use the rags to their fullest (make em black) and dispose of them. If you use a rag to clean a bench or table and they are clean the certainly clean them in the washer.

Heavy oils, grease, petroleum products, waxes, lube, etc.. really does not get clean by simply putting in a washer and just tends to get spread around or is held within the washer waiting for your coveralls to come along.

If the rags are heavily soiled, please put directly into the dumpster outside. That way they will not auto-combust in the shop at night or over the weekend.
Please take time every day to pickup clean and organize the shop, office, your personal desk, etc..

Housekeeping

If you have an office or cubicle it is your responsibility to keep it clean, keep desk organized, clean floor/carpet, clean throw rug on regular basis at car wash, clean desk top, dust off computer equipment, etc..

In addition, you should be cleaning an area of the shop/foyer, etc.. that is not a normal wear path.

Of course there are always:

Windows
Doors
Work tables
Kitchen area
Wash trash cans
Dust copiers
Dust Dust
Conference room table
Conference room bath room
Foyer floor
Vacuum
Bathrooms
Shop racks
Shop slop sink

Laundry room
Mop floors
Wipe down tables
Clean entry doors
etc., etc., etc.

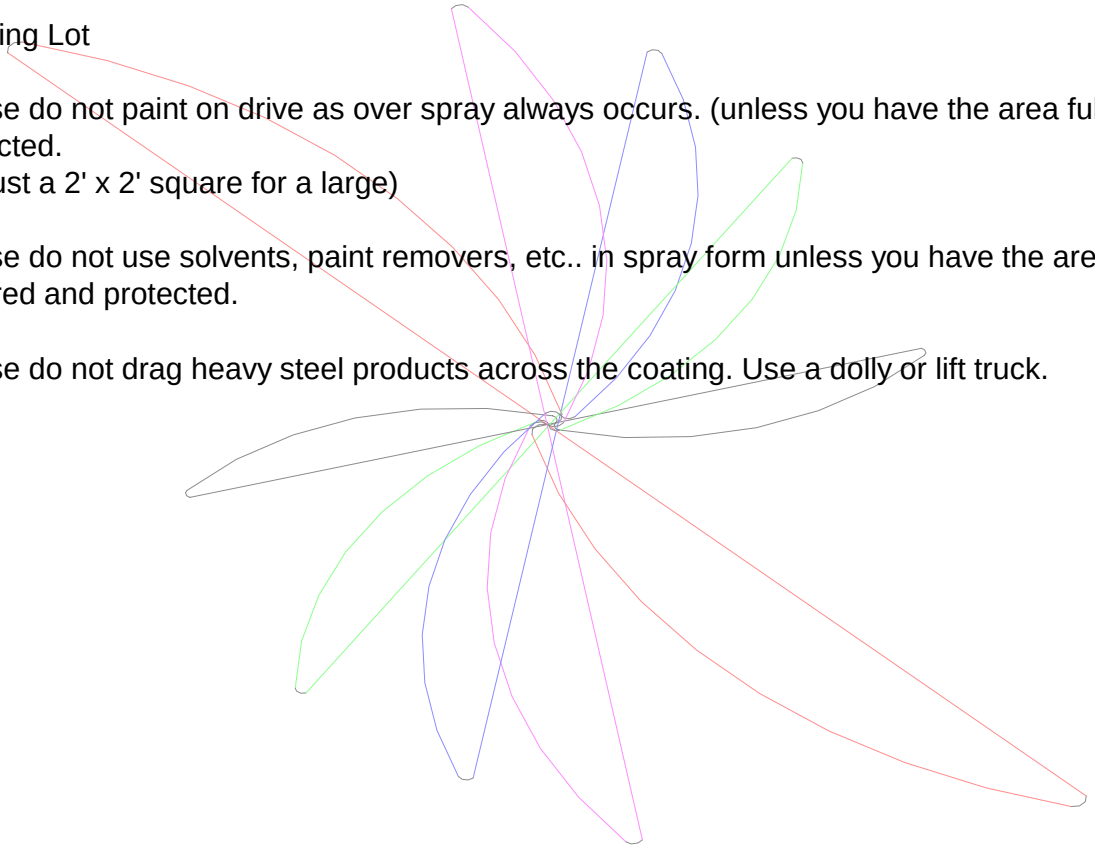
Do not track mud or dirt into the shop or office areas.  Please make sure your shoes are clean.

Parking Lot

Please do not paint on drive as over spray always occurs. (unless you have the area fully protected.
Not just a 2' x 2' square for a large)

Please do not use solvents, paint removers, etc.. in spray form unless you have the area fully covered and protected.

Please do not drag heavy steel products across the coating. Use a dolly or lift truck.



# Shop Alarm

This is for employees that enter/exit either the shop.

Due to differing start hours you must confirm there is no one in the shop prior to setting alarm. You must confirm you are last employee so you will set the alarm.

The front office and rear shop areas are not devoid of each other. The procedure for closing the shop and setting the alarm begins at the front of the shop (Conference room) and extends to the rear of the shop (North doors). You must confirm that all doors are closed, locked, tools off, coffee machines off, lights off, no adverse condition exist, etc.

If you don't know what to check - ASK.

After checking the shop, if you find a lone employee, working hard on his overdue report, you would tell them you are leaving and they are the last employee.

You can not simply walk out the door and set the alarm/or not set it.

Golden rule - Trust no one. Assume they have left the front door open and two soldering irons are currently burning through a wood table.

Multiple alarm calls result in charges.

All back office/shop people will enter into front office at end of shift to tell any remaining people that they are leaving.

They will add the following " As I know it I am the last employee".

All front office people will do a complete walk through of the building this includes bathrooms and check for remaining personnel and check for doors.

If someone is remaining you must say "I am leaving and you will need to close up".

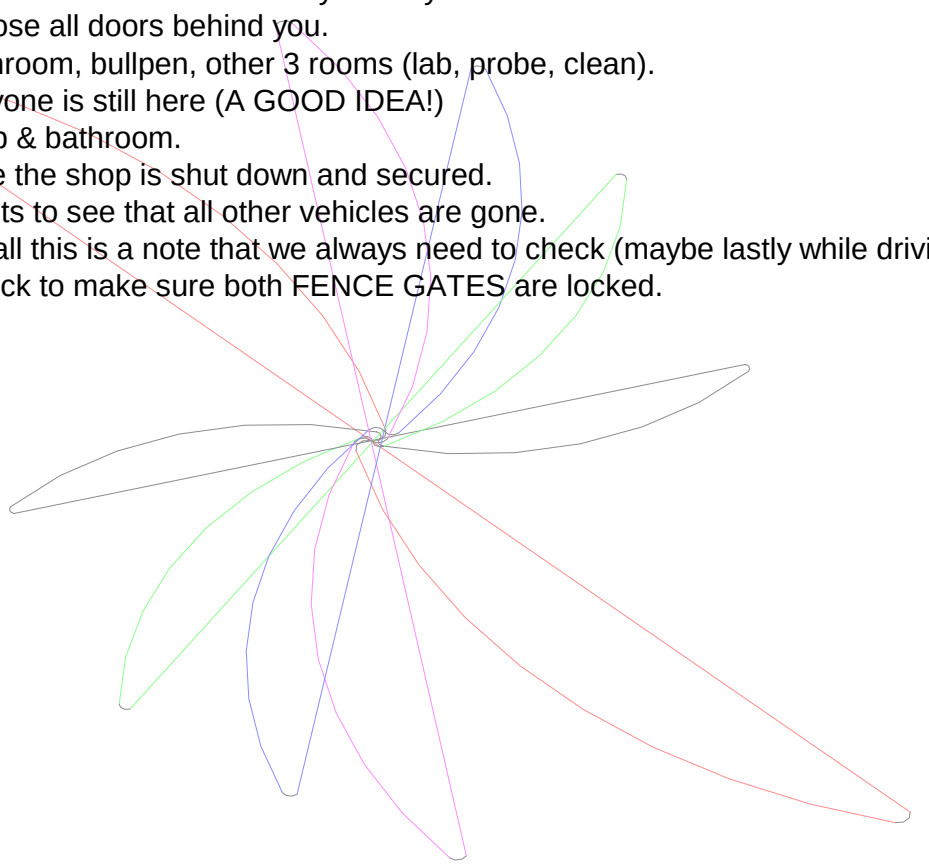
DO NOT JUST WALK OUT AND SET ALARM. YOU HAVE TO CONFIRM THE BUILDING IS EMPTY.

If you have set off the alarm for any reason you will text Ethan immediately. Even if you get to the phone and answer the security question.

Obviously the open/close report will list who set off alarm but Ethan would like to know as it happens.
So as soon as you have the alarm silenced and answered the phone call with the security question- send a text.

Shop Walk Thru Procedure Prior to Setting Alarm
Check to make sure the front office is shut down (lights, AC, coffee maker, etc.) and the front doors are locked (confirm this!). This is VERY IMPORTANT!

Then walk through the other front offices on your way out. Check that outside door is locked.
Make sure to fully close all doors behind you.
Check cubicals, bathroom, bullpen, other 3 rooms (lab, probe, clean).
Call out asking if anyone is still here (A GOOD IDEA!)
Check the back shop & bathroom.
Of course make sure the shop is shut down and secured.
Check the parking lots to see that all other vehicles are gone.
AND INCLUDED in all this is a note that we always need to check (maybe lastly while driving away / however) check to make sure both FENCE GATES are locked.



# Shop Parking

**Shop area personnel**

Please do not park your company vehicle on the outer row (street side) of parking spaces.

These vehicles need to be parked on the inner row facing the building.

Do not leave vehicles in front of doors.

Do not bring vehicles inside to wash. Even if it is cold. There is a full service wash business just down the street. You will live

**Caged area**
Park against the fence.

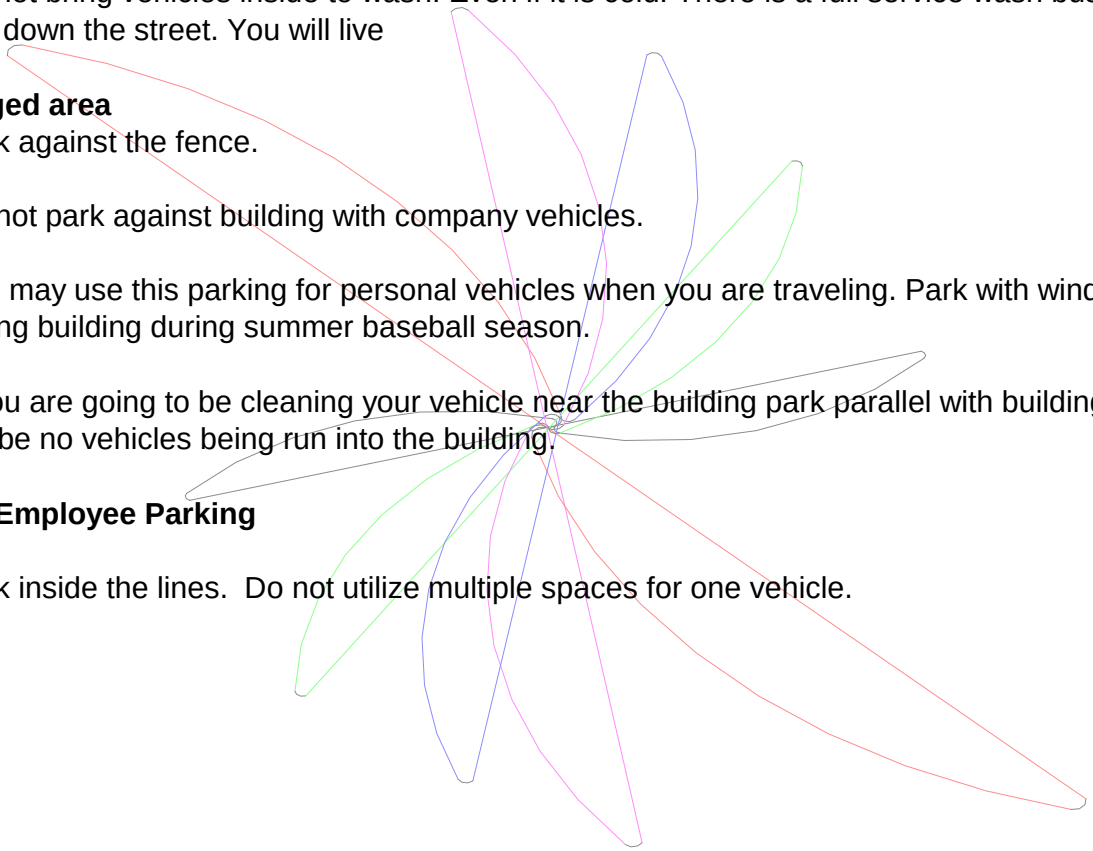
Do not park against building with company vehicles.

You may use this parking for personal vehicles when you are traveling. Park with windows facing building during summer baseball season.

If you are going to be cleaning your vehicle near the building park parallel with building. There will be no vehicles being run into the building.

**All Employee Parking**

Park inside the lines.  Do not utilize multiple spaces for one vehicle.



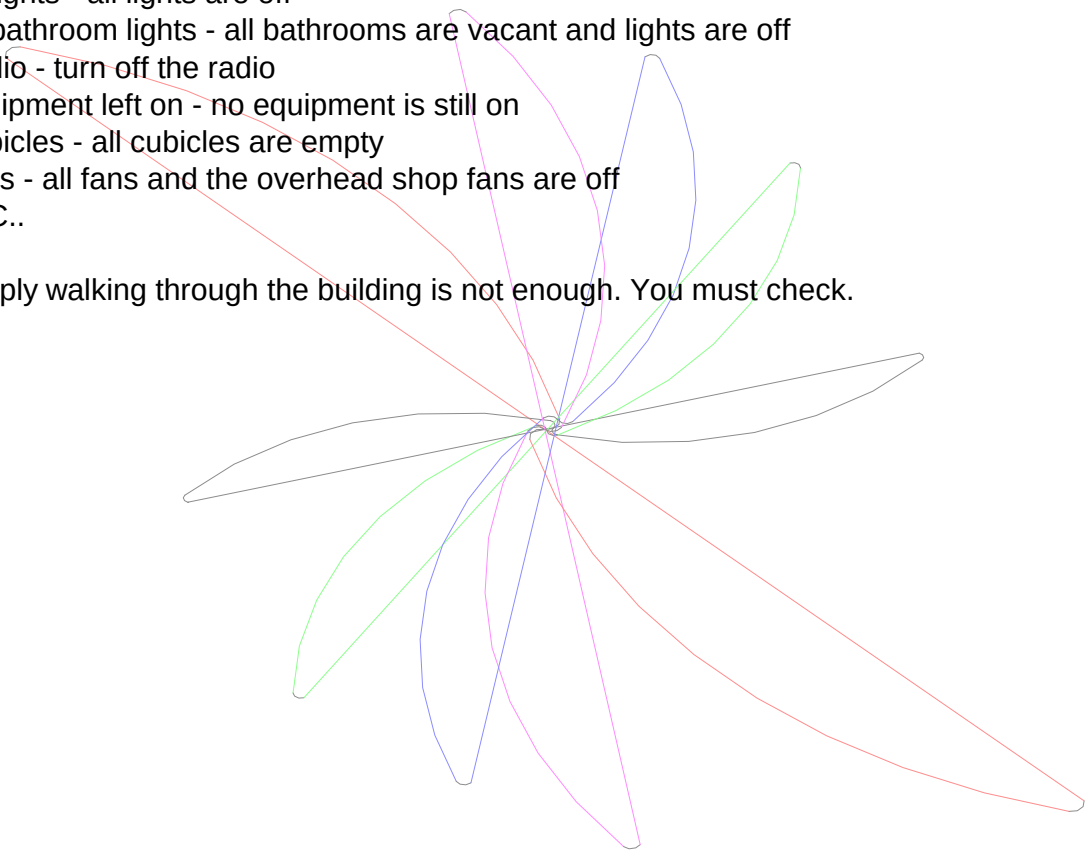
# Closing Shop

If you are the last to leave the building you need to check the entire building.

This would include the following.

All doors - make sure they are closed
All locks - all doors are locked
All windows - all windows are shut and locked
All lights - all lights are off
All bathroom lights - all bathrooms are vacant and lights are off
Radio - turn off the radio
Equipment left on - no equipment is still on
Cubicles - all cubicles are empty
Fans - all fans and the overhead shop fans are off
ETC..

Simply walking through the building is not enough. You must check.



# Do Not Flush

We have cleaned the shop pipes that were clogged and pulled out many wonderful things.
The only thing that should go down the drain is basically water, soaps and the obvious - poop.

The following items will not be flushed down the drains, toilets at shop.

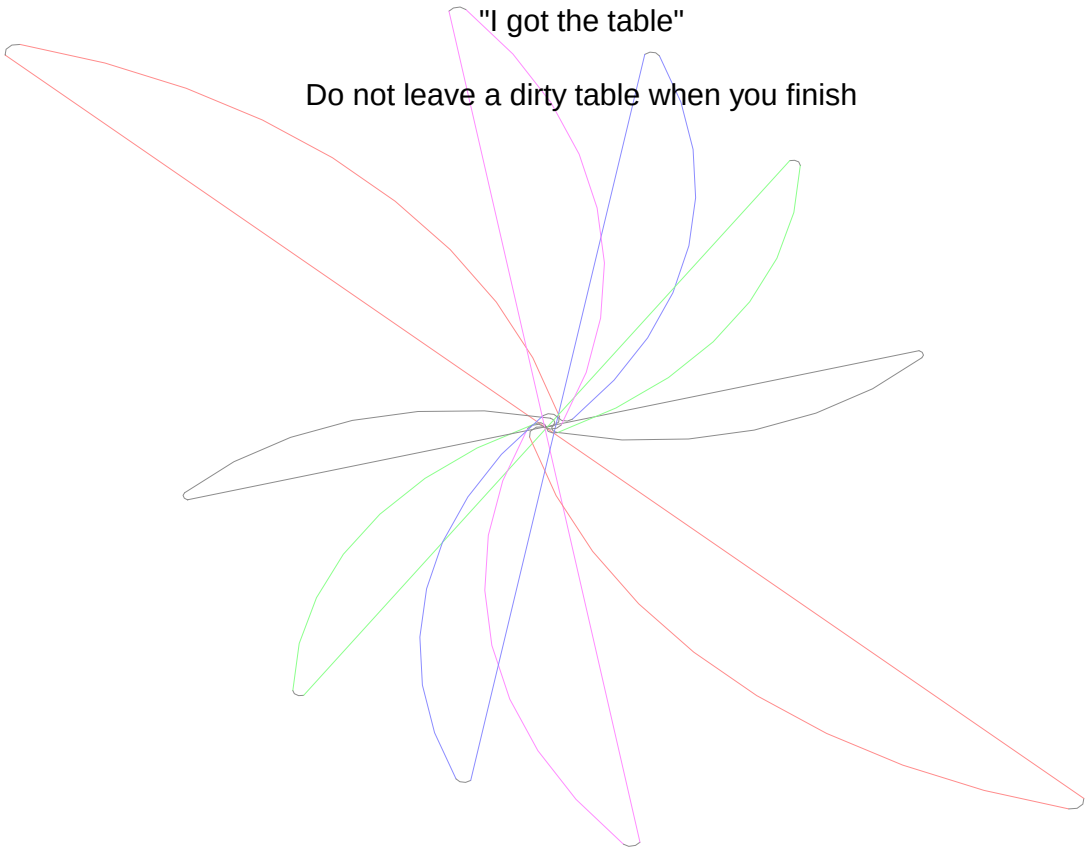
- Food:
- Hair:
- Paper Towels: .
- Tampons
- Wipes:
- Floor sweep
- Plastic items
- Plastic bags
- Cigarettes
- Cotton Swabs/Pads/Balls
- Grease:
- Food Scrapings:
- Chemicals:
- Stringy or Thick, Fibrous Peeled Fruits and Veggies:
- Any Food that Expands When Wet:
- Eggshells
- Bones
- Grease
- Non-food items

# Lunch Area

If you eat in the lunch area you will clean the table you eat at after you are finished. If you are with others someone will say

"I got the table"

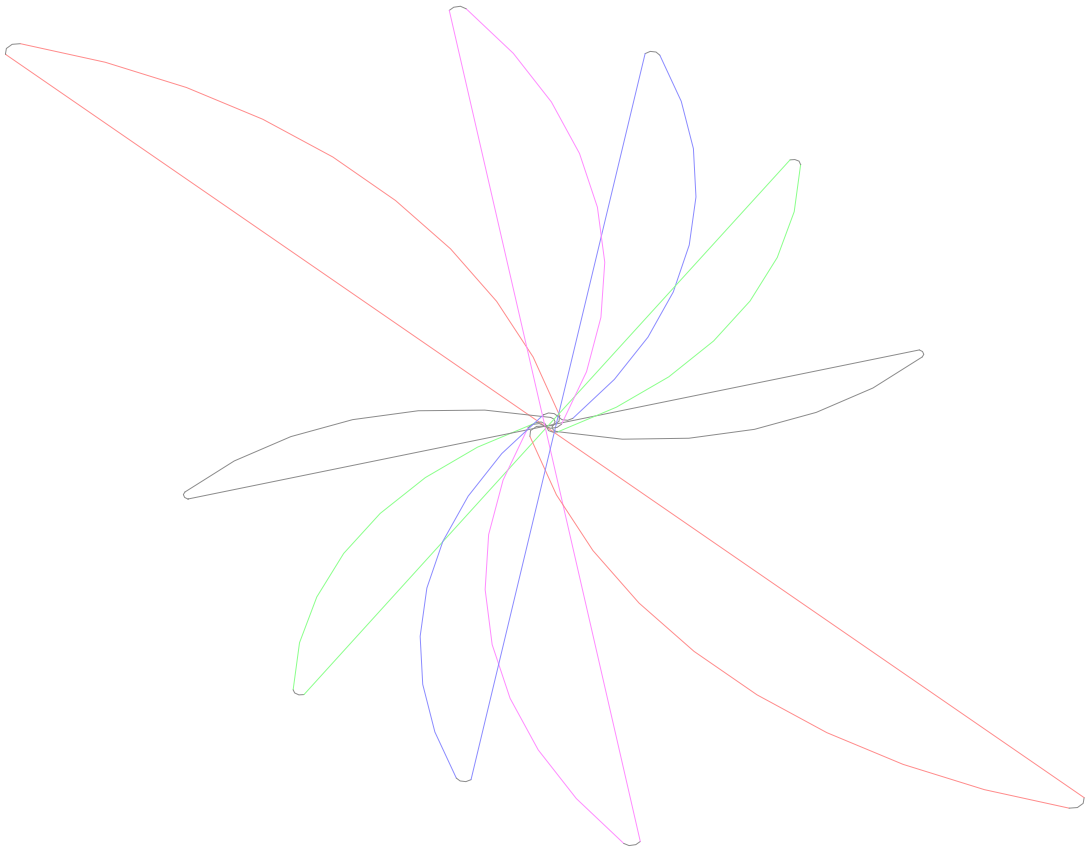
Do not leave a dirty table when you finish



# Shop Time

Please note the following:

**Shop time** - You are to be constantly working on a project which benefits the Magnetec organization. If you are at a desk for hours there needs to be a document produced for that work. So, assume you are working for 6 hours at your desk. There should be multiple documents which are produced which directly benefit the company. If you are not currently working on a specific document, project or report you need to be on the shop floor performing duties. If you have a question of a specific duty come and ask. Or like the golden gate bridge - clean from one end of building to other and start over.



# Snow Removal

The following is in reference to snow removal, however there are some correlations to the building in general.

Do not use the snow blower at/near/adjacent to the doors, building or vehicles. When using a snow blower keep 12 inches away from a edge (say a door) so that you do not run it into the door. This fine work will be completed with a hand shovel. I do not want collateral damage to the building or vehicles by a frozen handed well intentioned employee.

Do not snow blow on a tight radius around a vehicle. One slip and we have a scratch down the side or a dent. THIS WILL NOT HAPPEN.

I do not want any more bent door bezels.

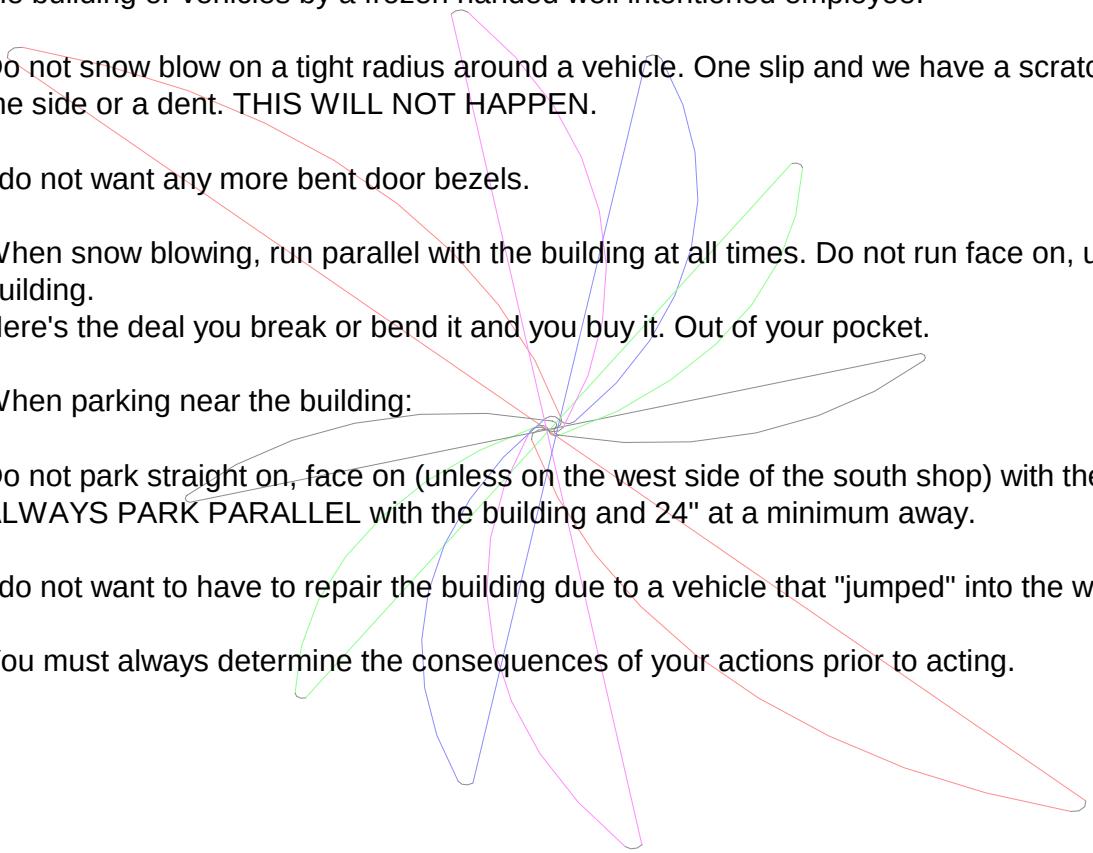
When snow blowing, run parallel with the building at all times. Do not run face on, up to the building.
Here's the deal you break or bend it and you buy it. Out of your pocket.

When parking near the building:

Do not park straight on, face on (unless on the west side of the south shop) with the building. ALWAYS PARK PARALLEL with the building and 24" at a minimum away.

I do not want to have to repair the building due to a vehicle that "jumped" into the wall.

You must always determine the consequences of your actions prior to acting.



# Forklift

When not actually seated in the forklift it should always be turned OFF.

Do not let it idle and get off to go anywhere.

Even if it idles with the emergency brake on.

If you leave it then STOP the engine.

We don't want any accidental movement of the machine.

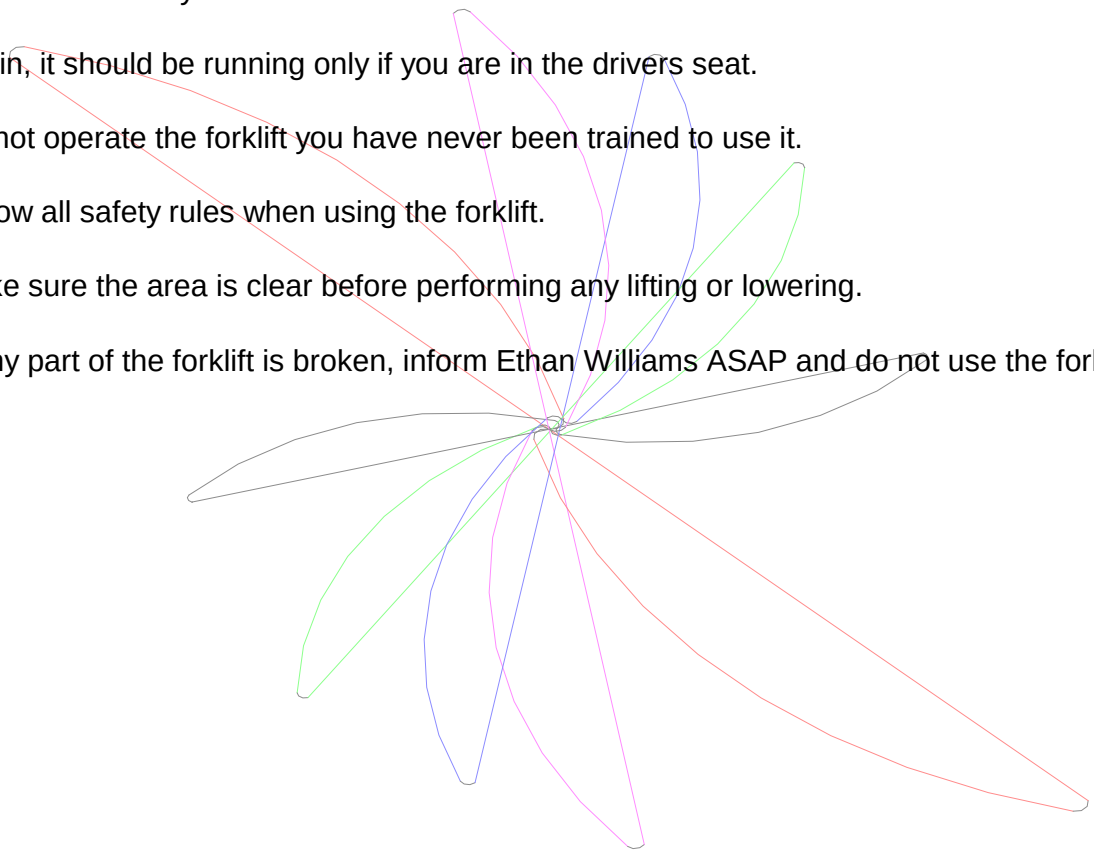
Again, it should be running only if you are in the drivers seat.

Do not operate the forklift you have never been trained to use it.

Follow all safety rules when using the forklift.

Make sure the area is clear before performing any lifting or lowering.

If any part of the forklift is broken, inform Ethan Williams ASAP and do not use the forklift.



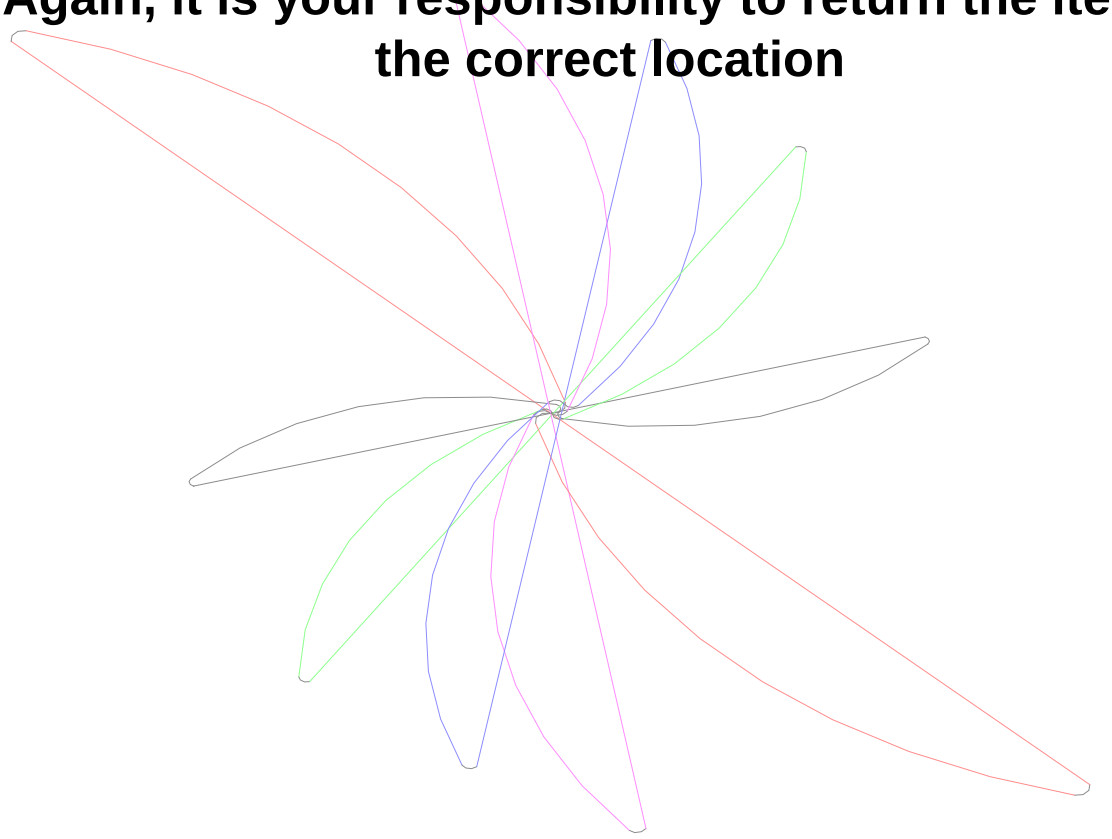
# Equipment

Just about every piece of equipment, tool and device has a specific place in the building.

If you use, move or temporarily re-position you need to return that item to it's original place.

Simply putting something in a drawer only hides it from everyone else. So, If you move it and put it back everyone else who may be needing it will find it in the correct place.

**Again, it is your responsibility to return the item to the correct location**



# UPS - Sending Packages

1) When we ship anything there must be a receipt of some form kept for records.
UPS - Front page of shipping document.
USPS - Tracking Number.

2) An additional form will be attached to all UPS shipments. These will be located on top of the filing cabinet in the conference room. This form will include your name, who your shipping to and what your shipping. These must be attached to the copy we get back from UPS and turned in to Jennifer.

In addition to the required addresses, we must include our account number on the UPS address label. There is a section for it at the top of the label and our account number is 1VV178.
We also need to check the box that says "Bill shipper".

After you fill out the address label, take the middle copy of the label and attach it to one Mandy's forms (which can be found on top of the filing cabinet in the conference room) so that she knows what was shipped, to where, and by who and so that she also has the tracking number.

Forgetting these things can prevent a package from going out on time, if at all, and cause confusion as to the where/what/when/who status of equipment.

When you ship anything put our name and phone# somewhere on the box

If a package is lost by the carrier and we have no tracking number then it is gone.

When you send out a UPS, Fedex, USPS, to anyone.

You must:

1) Fill out appropriate labels - you can assume we have inter-company documents also.
2) Prepare the package.
3) Forward all documents to office.
4) Send confirmation E-mail to specific receiving parties. This would include (when shipped, How shipped, When to expect, Tracking #'s, etc.)
5) Do some form of tracking during transit to confirm the package is not lost.

# Payroll

All hours worked are to be entered into the payroll work book and turned in weekly.

We will pay a $2.00 an hour night shift premium to Magnetec employees only.

This covers all days of the week and weekends. This is not a time and a half increment basis.

We will not do a % basis increment based on specific hourly rates as this will be time consuming for the accountant.

All payroll hours, OT, P/D, etc.. will need to be turned in by 9:00am Monday morning for that weeks payroll. This time is firm and hours entered after this time will be billed to the next weeks payroll. You will have to re-enter these hours at that time. Magnetec pays for the time to assemble both the hours and to enter information into the accounting program and when information is forwarded to quickbooks and the bank. We will incur this charge once.

Please understand that things do happen and mistakes are made. This might affect your paycheck and will need to be rectified on the following payroll. If there is a problem send a note to Carrie with the mistake and re-enter the problem items the following week.

All comments, problems, communication with regard to policy are to be directed to Ethan. (Missing hours, P/D, etc.. are to sent to Carrie by standard entry methods cw@magnetec-inspection.com.)

The policy is to control the payroll process and insure that all employees are paid on time.

Your payroll hours are to be turned in by YOU.

If you have another person turn in these hours it is your gamble. If you delegate your hours and they do not get the hours in/or in correctly then you should contact him for your financial arrangements. Even if you delegate someone to turn in your hours it is still your responsibility to insure the correct information is sent for these hours.

The payroll is run once a week as per the established procedures. The company will run the payroll once a week only. It is the company's interest to make sure you get paid on a timely basis.

If for some reason Magnetec is at fault we will make all arrangements to cover these funds.

(For your information) The following sequence is performed with regard to payroll.

1) Hours need to be turned in by 9:00am Monday.

2) The total payroll is compiled on Monday afternoon.

3) The complete company books are transferred on Tues to the bookkeeper to do payroll.

4) Funding is Transferred on Tues to cover payroll and associated Federal and State taxes.

5) Individual checks are drawn and deposited on Tues afternoon along with taxes.

6) You payroll deposit is available in your bank on Thurs. (Note: We are not the banking system and/or your local bank. Deposits may come sooner and/or later. Please check with your bank provider for specific information.

7) Our official payday is Fri. of every week.

We send an email reply out to the MII employees each week indicating we got their hours. This is sent out in these ways:

By Group or Individually sent email which gets i.e.
Payroll Hours Received W/E 08/02/09-Thank you, your payroll submission has been received in time for W/E 08/02/09 . or
Payroll Hours Received W/E 08/02/09 LATE- Thank you, your payroll submission has been received but will paid with the following payroll W/E 08/09/09 .

If “NOTE” is added please read to follow special instructions. This is most often added to privately sent payroll receipts as to not reveal sensitive information, therefore, if someone’s name is not shown in the group emailing, this could be due to the fact they got an individual reply.

If you don't get one by Tues morning 5AM and you got it in, in time, then contact Carrie (708) 259-2555 before Tues 10AM to make sure you've been included.

Salary:
As usual you will enter the actual hours you have worked on a weekly basis. We intend to track the hours worked against the salary total to generate an hourly rate. This track will not change your pay but it will allow us to see your pay in an hourly format.

Salary/Adjustment:
You will continue to enter your hours as usual for any specific week. We will be tracking what you have made in an hourly format against what you were paid in a salary format. This track will show an underpayment or overpayment on a weekly basis over the year. A review and adjustment will be made on a quarterly basis. This will be reviewed with the specific employee so the adjustment is the correct fit for both the employee and the company. In either case you will be paid for every hour worked at your current pay scale. Your end of year total pay will be total of hours worked times pay scale.
This program will help the employee with regular weekly checks and the company with averaged payrolls.

NOTES:
We will not cut checks mid-week unless it is the mistake of Magnetec.

Do not contact another employee for resolution, question's, etc.. with regard to your pay. These go to/through cw@magnetec-inspection.com only.

Standby
- If you are required to be on standby within the plant or if you are elsewhere but working a specific MII task and OT could apply it will.
- If standby puts you i.e. at a hotel you get 8 Reg hrs max only
- If standby puts you at home and you are not working on MII tasks you get 0 Hrs for that day.
- If you are working the night shift you will only get the bonus $ if you are at the worksite or asked to do MII related work.

Some of you are not submitting adequate notes for payroll to be done properly. If you expect a pay check you need to send the info.

If you worked: You need to submit your payroll workbook with the hours, details & job #s (Or the other means of getting the info in as stated before).
If you did not work: You must send an email stating that you have no hours to report. (You don't have to send a blank workbook.)

Bonuses
So to clarify - As has been in the past and will be in the future the bonuses will go out the pay period prior to Christmas.

So if Christmas is on a Thursday the bonus's will go out the day before on Wen.
If Christmas is on a Friday the bonus's will go out on the Wen. before.
If Christmas is on the Weekend after the pay period the Bonuses will go out on The Wen prior.
If Christmas is on a Mon, Tues, Wen then the Bonuses would go out the week before.

Magnetec will start paying double time for anyone who is working or driving on Easter, Thanksgiving, and Christmas. Only those three holidays. If anyone is in a motel on standby on that day it will still only count for a straight 8. Even if Christmas is on a Sunday nothing extra will be added for that day.

## *Payroll Continued*

Payroll rules can be found in your Payroll Workbook under a red tab towards the right.
1) The work week is from Monday to Sunday of any specific week.
2) Employees are paid regular/straight time for the first 8 hours of work during a work day and time and a half from the 9th hour onward (See #3).
3) Overtime is time and a half (1.5) for any hours over 8 on any specific day, regardless of total hours worked for the week.
4) All weekend hours are time and a half (1.5) if the quota is met (See #5)
5) An employee must work 24 reg/straight time hours during the work week (See #1) before weekend time and a half hours are given. (i.e. if 23 hours are accumulated through Fri and 8 hours are worked Sat, that means the first Sat hr will be reg/straight time to reach the quota before #4 applies).
6) All travel time will be paid at the above mentioned rates.
7) Standby time will be paid as straight time regardless of the day.
8) Magnetec expects a days work for a days wage.
9) Work descriptions & Job numbers must be stated for each day's hours are submitted. If you are unable to detail that information when submitting your hours, you are still liable to bring this up-to-date by the following week.
10) We will pay a $2.00 an hour night shift premium. Effective 6/11/2007. This covers all days of the week and weekends. This is not a time and a half increment basis. We will not do a % basis increment based on
specific hourly rates as this will be time consuming for the accountant.
11) All payroll hours, OT, P/D, etc. will need to be turned in by 9:00am Monday morning for that weeks payroll. This time is firm and hours entered after this time will be billed to the next weeks payroll.
a. EMPLOYEE - Hours should be in Sunday night. Drop dead time is Mondays at 9:00am.
b. PAYROLL SECRETARY & ETHAN Hours are assembled and reviewed by Monday at end of shift.
c. ACCOUNTANT, BANK, QUICKBOOKS - QuickBooks Payroll, accounting, payroll funding transfer, deposits to employee account On Tuesday
d. FUNDS - Available in employee account sometime Wednesday. This is a function of your bank and not in control of Magnetec. Our original policy is payday is every Friday
The policy is to control the payroll process and insure that all employees are paid on time.
12) HOLIDAYS Easter, Thanksgiving, & Christmas gets an additional 1/2 time added, not including standby. (Note from Mng: Magnetec will start paying double time for anyone who is working or driving on Easter,
Thanksgiving, & Christmas. Only those 3 holidays. If anyone is in a motel on standby on that day it will still only count for a straight 8. Even if Christmas is on a Sunday nothing extra will be added for that day.)
13) VACATION - If you take a vacation day(s) you must enter into the payroll workbook as such. Every vacation day must be accounted for or it will be considered a no show.
Verbage from the FLSA with regard to Overtime pay:
Hours of Work: The normal work week for most employees is a 5-day, 40-hour week. Some companys/departments differ.
Overtime: In conformance with the Fair Labor Standards Act and the Personnel Rules employees must receive, either time and one-half pay or time off at time and one-half for hours worked in excess of 40 in one work-week.

Salaried and other Exempt Service personnel are expected to perform such additional services and hours of work as are required, and receive no compensation in time or additional pay.

Time – off / vacation time: IN DETAIL
Employees may take time off as they need. This should not exceed two work weeks or 10 days. Adjusted employees (Class #1) need to account for this time on their weekly payroll workbooks and this time is not accounted for in determination of yearly hours. Salary employees (Class #2) need to account for this time on weekly payroll workbooks. Hourly employees (Class #3) do not need to account for this time on weekly workbooks and are not paid for this time.

An email to ETHAN must precede this request by as much time as possible with a minimum of 2 weeks. Emergency situations are exempt for this policy. It is recommended that the 10 days are divided into two separate time frames. It is recommended that the timing not be in the spring and fall busy season.

Employee availability:
All employees are assumed to be available for work unless requested time off is active.
An employee not available for work when requested will be assumed to have voluntarily quite their job at no fault of the company.

With regard to vacation days.

Your vacation days must be entered into your payroll workbook for the specific week they fall.

Please highlight/bold these days so they are more easily captured.

Your pay may be adjusted up or down if your workbook did not reflect the guidelines of Rule #12:

12) HOLIDAYS Easter, Thanksgiving, & Christmas gets an additional 1/2 time added, not including standby. (Note from Mng: Magnetec will start paying double time for anyone who is working or driving on Easter,
Thanksgiving, & Christmas. Only those 3 holidays. If anyone is in a motel on standby on that day it will still only count for a straight 8. Even if Christmas is on a Sunday nothing extra will be added for that day.)

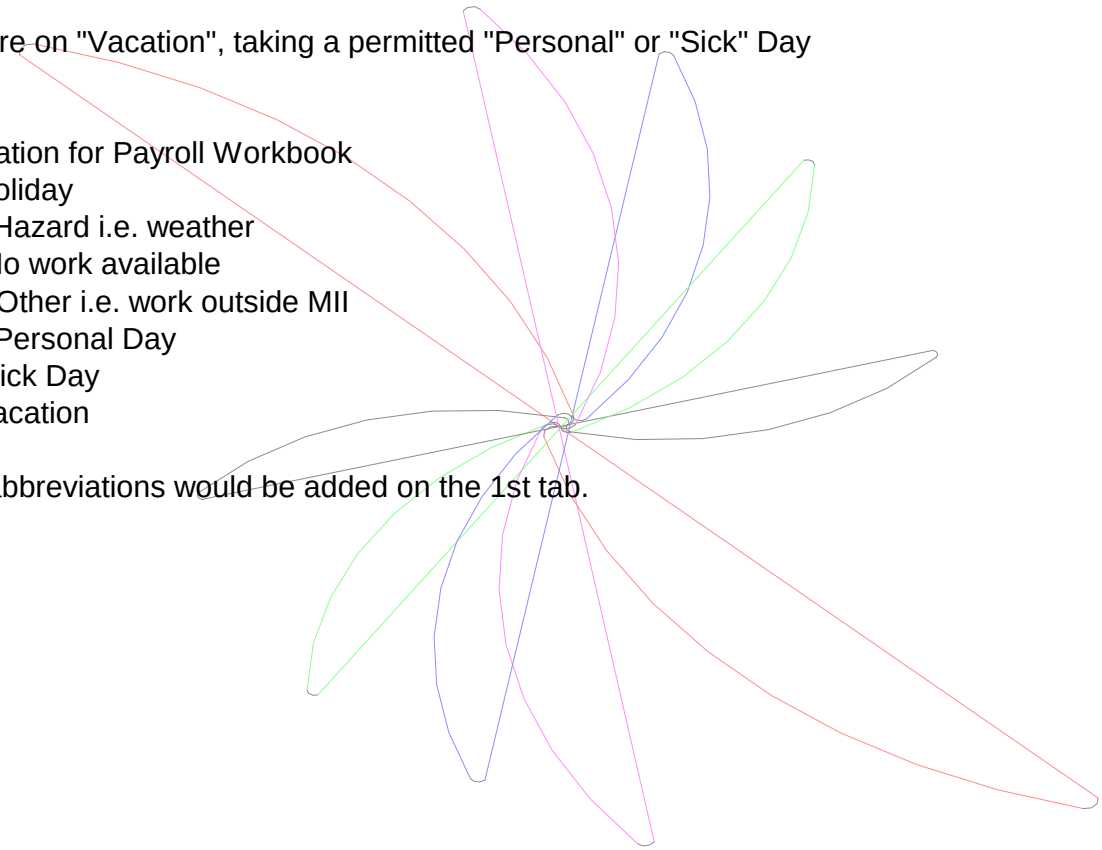
Hours Submitted via TEXT
We are now offering the option of sending in hours by Texting IF:
1. You cannot send your workbook in time for some reason
2. You are busy on a job
3. You have no hours worked or details to report
4. You are on "Vacation", taking a permitted "Personal" or "Sick" Day

DRAWBACK
You will still need to send your workbook as soon as you are able if you have notes related to job #s & hourly breakdowns to log.

REMEMBER
You must always send mention each week by email or text when
-- Off
-- You are on "Vacation", taking a permitted "Personal" or "Sick" Day

Abbreviation for Payroll Workbook
HOL=Holiday
HAZR=Hazard i.e. weather
NWA=No work available
OTHR=Other i.e. work outside MII
PRSN=Personal Day
SICK=Sick Day
VAC=Vacation

These abbreviations would be added on the 1st tab.



# Per Diem

When on the road you get $35.00 per day.

This is usually paid after the fact on your weekly payroll.

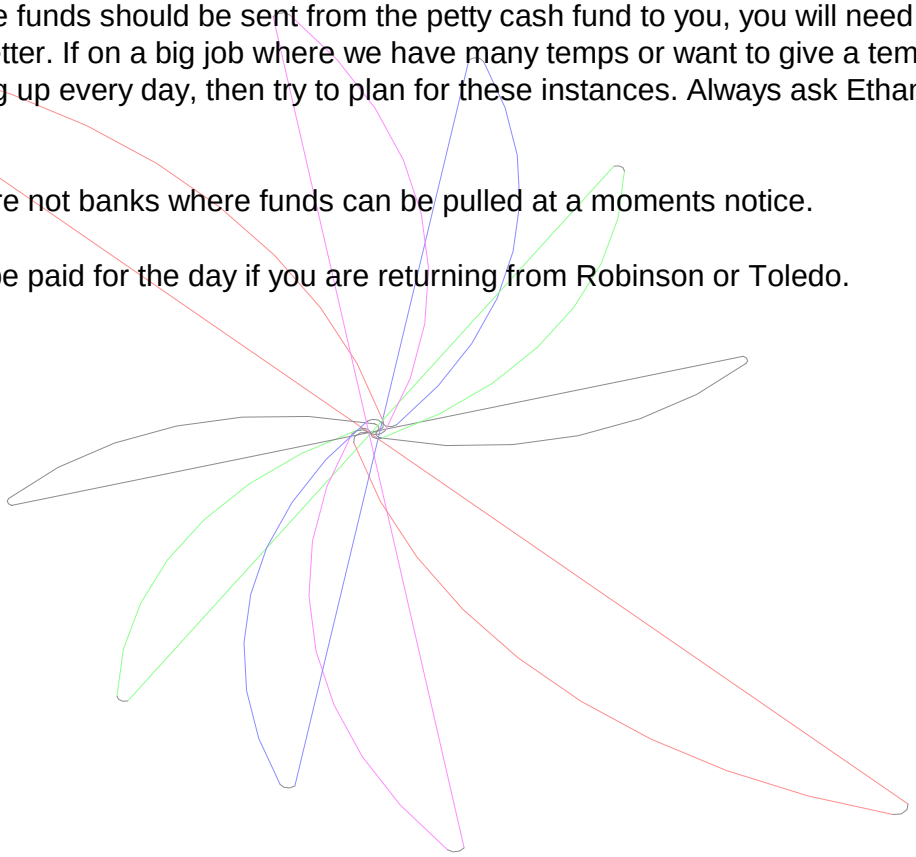
If you need funds for a job (temps, new hires, etc.) plan on asking Ethan prior to the job (Not 1 hour before leaving). It is not the job lead inspector's responsibility to get these funds for you once on the job.

Obviously there are times when some arrangement must be made on the job. (eg. New hires, lost payroll checks, etc..)

In these cases the funds should be sent from the petty cash fund to you, you will need to sign a disbursement letter. If on a big job where we have many temps or want to give a temp bonus for showing up every day, then try to plan for these instances. Always ask Ethan about this.

Our employees are not banks where funds can be pulled at a moments notice.

No per diem will be paid for the day if you are returning from Robinson or Toledo.



# Days Off Vacation

Magnetec is generally open on days-off, late arrival at the shop, early leave, etc..

If you have delegated a start shop time (6:00am, 7:00am) you need to be there at that time and are expected to work all 8 hours.

If you need to leave early, you should make arrangements prior to the day of work, ask Ethan Williams. You are not guaranteed to get approval.

If you are going to take a day off you need to call the night before. Magnetec does not accept personnel taking a day off without a call. This can be grounds for immediate job termination as there may be plans made for you or a job might phone in and we need everyone available.

When you get in town from a long job you must let Ethan Williams know your plans. If would like to take a couple of days, Ethan Williams must give you approval.

**Time – off / vacation time:**
Employees may take time off as they need. This should not exceed two work weeks or 10 days

An email must precede this request by as much time as possible with a minimum of 2 weeks. Emergency situations are exempt for this policy. It is recommended that the 10 days are divided into two separate time frames. It is recommended that the timing not be in the spring and fall busy season.

**Employee availability:**
All employees are assumed to be available for work unless requested time off is active. An employee not available for work when requested will be assumed to have voluntarily quit their job at no fault of the company.

All vacation requests will be directed to Ethan.

Your vacation time is to be recorded as such on your weekly payroll workbook.

The entry should clearly read "Vacation time"

Only pre-requested (E-mail) and medical emergencies to Ethan will be honored.

When you request a vacation you will need to have a return e-mail from Ethan for confirmation.

After approval, you will email Ethan, Jennifer and Carrie before you go on vacation as a reminder. The day you return from vacation will send an email again to Ethan, Jennifer and Carrie to tell them you are back from vacation and available for work.

# Personnel Duties

The inspection process requires a tactical sequence of processes to insure the highest quality and production. The following are guidelines that are to be followed during this process. Large jobs that have multiple crews and a data/report person are to be managed by the lead person on the job.

Communication is primary key for completion of a successful job and client satisfaction. It is imperative that all personnel have a global overview of the job and work as a team to complete the work scope in the highest professional levels possible. Your head must be in the game and you will need to review your individual actions and accomplishments on a daily basis to be a key member of our inspection team.

Individual crew/ Inspector responsibilities.

1. At the beginning of the day each crew is to prepare their specific inspection vehicle for the days inspection needs.
• This would include setting the data station, equipment, red cable, head phones, etc. – Prepare probes, cal-tubes
• Check all battery power items – Camera, light, scope, etc. Maintain a constant vigil for recharging all batteries ie. Camera, scope, tablet PC.

2. Secure valid permit, calibrate equipment, (a valid calibration which is stored in the project should be performed) and position vehicle for days inspection.
• Have all proper PPE and use them. Lock out in needed.
• Monitor caution and danger areas. Know confined spaces/regulations.
• Check scaffold tags. Know the limitations.

3. Complete the inspection process.
• The Edata for a specific job must be managed correctly and transferred to the appropriate location. At least one centralized computer location. One common USB stick. Do not leave a job with Edata of your machine.
• A complete field report must be prepared with pertinent data.
• A Complete set of photos (In focus) must be taken. These should be checked by the tech to determine the validity of the photos.
• The job folder (Manila) must be populated with all the field information.
• The job folder is put in the “IN BOX”
• The HX form is updated with the project info.
• You may have to find and copy client report folder.
• Get P&ID’s.

Keep in mind that the most important task we have is the bundle inspection. This is what we are in business for. Give it nothing less than the best of your attention in all things considered.

Gather the exchanger specific's, past history, operating pressures, temps, tube sizes from the project folder prior to entering the plant. Write this information down (mini binder which you should carry during the job) for reference in the plant. Do not carry manila project folder into the plant. Keep these folders in the plastic job box's or use in the M2 when you finalize the report.

Prepare the following electronic files:
.csv – Complete with final call.
.ts –
.jpg –

This task is to be performed by the tech that tested the specific exchanger.
This task can not be passed to the data/report person. The data/report person will pass the task back to you if not completed.
The data/report person is to prepare the report (manipulate text, photos, etc..) only. They do not gather, interpret, complete, and prepare field data. This is a responsibility of the inspector.

4. De-mob your vehicle. If you have borrowed equip.'s this must be returned to the correct person. Your vehicle is to be clean and organized which should involve a regular schedule.
• If you have specific vehicle issued to your name you must keep is fully stocked.
• You are expected to have all equip. and supplies to perform your job duties.
• If you have equip.'s that does not work you must report it ASAP.

5. You should report your specific inspection completion to the lead person and report any corrosion detected. (The 50% rule – If you are going to make a call of 50% you must get someone else involved, report to lead person, get Edata out ASAP, send Edata, prove-up wall loss in some other way, etc.

6. Relax, try finishing all with a bundle before moving on to the next one.

All specific field data, reports, HX entries, photos, etc.. are to be in the project folder in the "IN BOX" – Do not ask the data/report person to alter any part/portion of the report for you. You must pull the project folder and make the changes yourself and re-insert into the "IN BOX". The data/report person is off limits except through the "IN BOX".

You are not to report any inspection result, completion percent, result, etc.. to the plant personnel. This information is to go through the lead person. This includes all Magnetec personnel on the job site including the data/report person. If asked you are to respond "Let me check on this information and get back to you ASAP" – Get the question to the lead person so an answer can be formulated. THIS IS VERY IMPORTANT!

Take time to keep things neat, clean, and organized.

**Data / Report person responsibilities**

The data/report person is to enter/prepare and issue the field report reports and keep the HX form up to date. The data/person is not to make changes to the field report with regard to content. Only changes to clerical, spelling, grammar are to be performed or changes which make the readability, clarity, flow of the report more concise for the plant personnel. Any changes with regard to field report, .csv, .ts, .jpg content are to be performed by the inspector (s). If you are asked to make changes from Magnetec inspectors your response is “Please make changes to the file folder (Field report, photos, etc.) and re-insert into “IN BOX”. This is the only way changes can be made – through the “IN BOX” – This includes the lead person.

Questions from plant or plant directed personnel are to be forwarded to the lead person.
If asked you will respond “Let me check on this information and get back to you ASAP”
You are not to answer questions with regard to exchanger specifics, current progress on inspections, current day’s activities, etc..
You may respond to questions directed to completion of reports only. Our policy is the following: “A report is complete when it is issued” – obviously if a report has not been issued it can not be complete.

A report can not be late, overdue, etc. if it has not been issued. The lead person is to direct the completion of specific reports not the plant personnel.

1. The HX form must be kept up to date with all changes, revisions.

• The form should be printed as required to keep readable. (assume 2 times a day)
• The form must be sent at least once a day at the end of shift to plant personnel.
• Copies should be printed in the morning as reference for the inspectors.

2. Summaries are to be prepared from the “IN BOX” as the reports become available.

The following must be checked prior to issue:
• Does the verbage make sense with regard to content and context.
• Is all the pertinent information available to complete a concise report.
• A spell check must be performed prior to issue.
• Is the correct nomenclature and bundle info in the report.

Upon completion of the field report the data/report person must carry folder to HX form location and confirm information on HX form is correct. The inspectors should have completed this step; however the HX will be double checked with file in hand.

A copy of the front page will be printed and inserted in specific file.
The completed report folder is then filed back into the plastic file boxes in correct order.

A copy of the front page will be printed and put in a manila folder for review of the lead person. Each days completed front pages from the field report reports will be reviewed prior to the .PDF version of the reports from being issued. This will allow for mistakes, mis-spelled words, readability, etc. to be changed/altered.

**DO NOT ISSUE MISTAKES AND MIS-SPELLED WORDS.**

3. Use the inbox to store report projects in the interim. Work one or maybe 2 reports at a time. No piles of manila job folders on desk.

4. The file boxes must be kept in correct order with files organized.
A check should be performed at least once a day or as time allows.

5. All files must be kept in order and organized and should contain the following:
- Completed field copy
- Exchanger history
- P&ID's
- Photo disk (s)
- U-1
- Drawings
- Any old Eddy Current reports.

(This would best case scenario - some information may not be available)

6. All photo disks must be reviewed as soon as possible (After report is put in "IN BOX") to determine if photos are complete and in focus. The data must ask for new/additional photos ASAP.

7. Time sheets are to be kept up to date with all plant requested information.
This may include PO#, work order #'s, specific exchangers.
Travel mileage to/from hotel must to add the daily time sheets.
Keep/populate weekly hours worked on payroll worksheet. (To be issued on Sun.)

8. All receipts/forms which are job specific will be kept in date order in a folder in the plastic file box's. (Temporary helpers receipts, safety council info, maps, plant memo's, issuance list's (H2S monitors, etc.))

9. A weekly reconciliation should be performed on the file box's which will include the following:

Correlate the completed report file folder with an entry on the HX.
Confirm a fully populated folder with pertinent/available information.
Confirm completed files/reports with issued (.PDF'd) reports.
Confirm alphabetical/numerical order of files.
Back-up all electronic files to second storage device.
10. When all is caught up and there is nothing available then reconcile things.

Lead person responsibilities

The lead person has the ultimate responsibility for all duties and tasks of the job. The lead person is expected to change from job to job or may by shifted from person to person during an extended job. All aspects of the job including specific inspections, client questions, reporting/summaries, safety issues, equipment issues, manpower, etc are under this positions control. The lead person is expected to fill in where required to insure a fluid flow of the job. This includes reporting, individual inspections, pulling, off hour inspections, etc.

The lead person will be actively involved in the inspection processes of specific equipment during the job. This includes but is not limited to calibration, data taking, pulling, data analysis, field reporting, etc..

The lead person is expected to give specific duties based on the requirements of the job, inspector qualifications, manpower requirements, safety issues, equipment limitations, etc.

The lead person will not delegate themselves out of inspection work. They are to be a key/major component on all inspections that involve a major call. (50% rule)

The lead person is expected to have control of the following:

1. Client contact and communication is a primary concern on large jobs. The client will be notified of each days tasks/inspections.
2. Thorough knowledge of the work scope and the HX form.
3. Specific individual inspections and the validity of the data.
4. General flow of the job.
5. Current completion status of the summaries and reports (field).
6. Personnel/manpower requirements and hours worked.
7. Extraneous costs to the job.
8. All safety issues/requirements, training, badging.
9. Equipment issues.
10. Review of inspection results and field report review and approval.

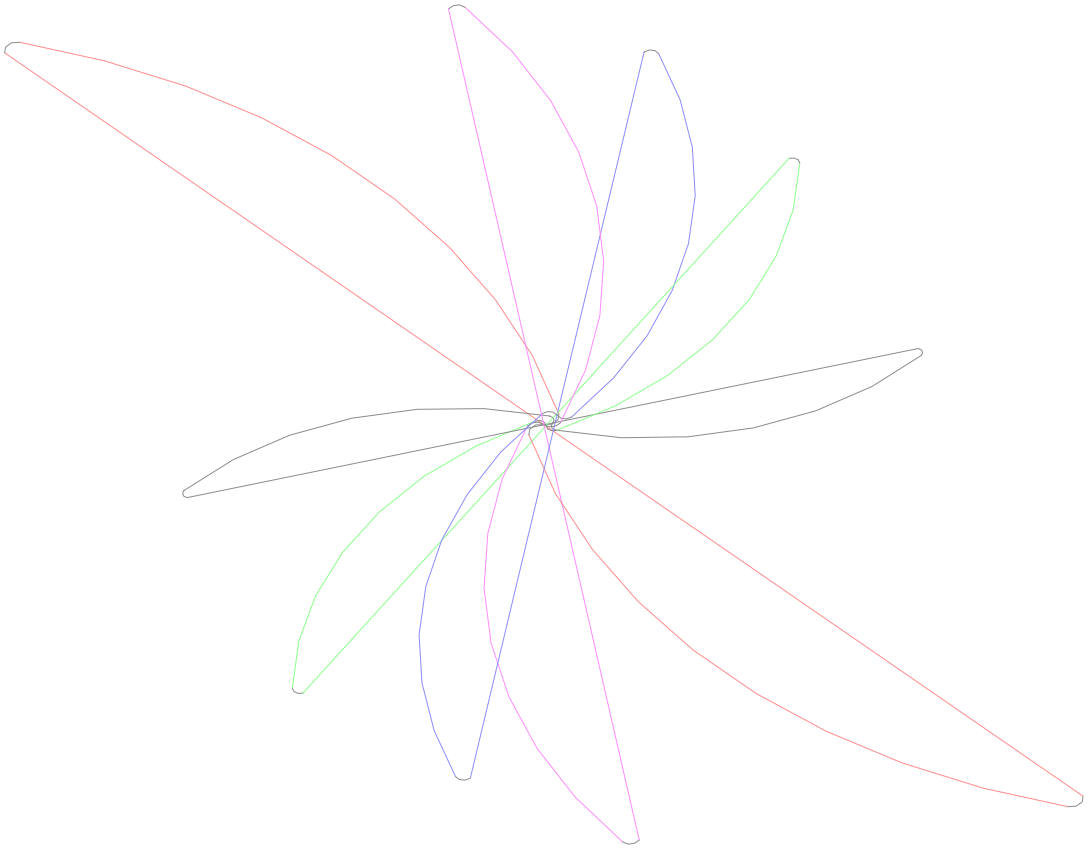
The above tasks are a small listing of the total job requirements and many additional duties are expected to be performed during a job. The communication from all personnel is a vital link for the effective completion of these duties and many questions and clarifications will be required to complete these tasks.

Whereas the individual inspector is to be held responsible for specific inspections/duties the lead person will hold the ultimate responsibility for the job.

The lead person will direct personnel on their daily inspection work scopes and will determine the specific duties each inspector will fill during the day.

The lead person will lead by example and from a position of knowledge and experience in the

The lead person will lead by example and from a position of knowledge and experience in the tasks at hand. As a job develops the pressure on the lead person will increase and must be met with a cool/deliberate mind. Personal control of emotions and anger is a must.



# Inspection Duties

Our inspection duties are to aid each other in all aspects of the inspection process.

This includes but is not limited to:

Equipment set-up
Data taking
Pulling
Report write-up
De-mob of equipment

All personnel will pull his percentage of a specific bundle. (eg. if you are in a 2 man crew you will pull 1/2 of the bundle, 3 man crew you will pull 1/3 of bundle)

This includes all personnel from the top down. You are expected to spend your turn in the mud and blood.

PULLING SPEED.

From my last job (MPLA) is was apparent that some of the hired help is pulling way to fast.

We need to be monitoring the pulling speed of the helpers and ourselves so that we get good inspections.

A puller needs to push the probe in as fast as he/she can without damaging the probe/cable (NOODLE) and withdrawal at a nice even speed. The individual strip lengths should be about the same.

The max pulling speed should be about 2 to 3 feet per second.

Remember:
Low frequency means slower speeds.
Smaller defects mean slower speeds.
Magnetic deposits mean slower speeds.
Very high permeability means slower speeds.

We do not want to blow past a defect.

1) The pulling speed past a defect is very important. If you are pulling to fast you will go past with no defect being detected. Do not underestimate the probability of a defect being missed. Case in point - Invista, Victoria

3/4" X .065 X 20 feet

There was numerous small defects that when tested at our normal speed there was no defect noted.
When pulled very slow the defects became very visible and were very deep. When we pulled a tube the defects were I.D. pits with diameters of .030

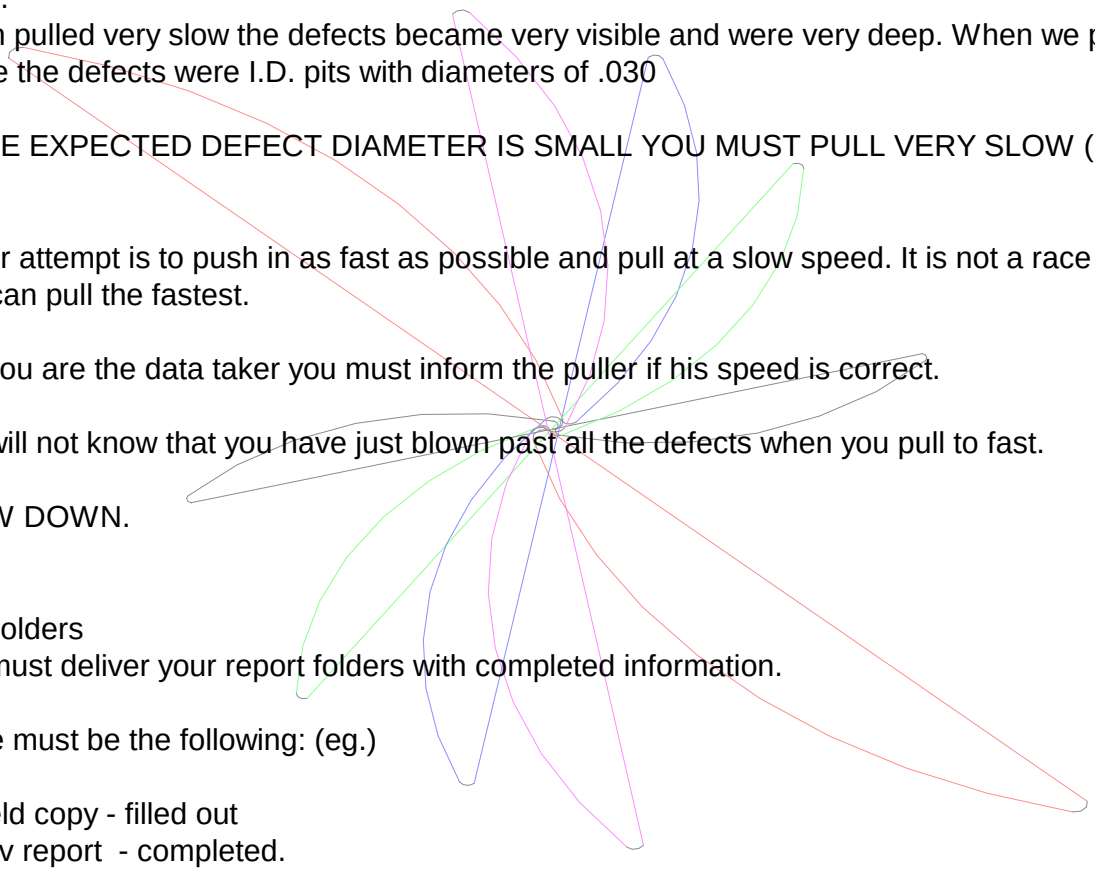
IF THE EXPECTED DEFECT DIAMETER IS SMALL YOU MUST PULL VERY SLOW (12" a sec)

2) Our attempt is to push in as fast as possible and pull at a slow speed. It is not a race to see who can pull the fastest.

3) If you are the data taker you must inform the puller if his speed is correct.

You will not know that you have just blown past all the defects when you pull to fast.

SLOW DOWN.



Job Folders
You must deliver your report folders with completed information.

There must be the following: (eg.)

1) Field copy - filled out
2) .csv report - completed.
3) Photos
4)TS
5)Screen prints
6)3D drawing
7)NDE page
8)Histories

Data central is to receive complete info. They can not complete a report with missing information.

The DC is to ask for information from you/us. We are not to direct the DC.

You are to inspect the bundle - they are to report the bundle.

Corrosion Calls
1) We have to make sure that the corrosion we call is there. Does the visual information support your call.

2) We do not leave probes all over the job. You must count your equipment and return to home base with what you left with. You must double check the job site for equipment. Do not trust "Oh no - I got it all". A probe cost to us is in the hundreds of dollars. We do not care if you are hot, cold, wet, thirsty, muddy, oily, tired, etc... You must protect company assets.

3) You need to double check your data. Do I have it, did I record it, where am I going to put it. Don't just push buttons and turn your head.

4) You must open your mind to the inspection you are performing. Are there any visual cues that might provide information. Is there any obvious conditions that might lead you to corrosion, failures, cleanliness issues, repairs, retubes, etc...
What does the data plates tell you. What does the tubes taste like. What does the tubes smell like - eg. ammonia will tell you a lot about the possible corrosion. What have we called the corrosion in our past reports.

You must always reference our past reports. Corrosion only gets worse.

On the Job Site
You must turn over your shift to the other shift correctly. If you need time to document info then stop early and document your information.

Our company policy is that our clients do not run our personnel - We do.

Do what is best for the bundle and the company. If you allow the client or designated contractor (eg. Alltech) to run you they will have you checking port - a - lets.

Do not set-up and tear down to get a "priority" bundle. No bundle is priority if it is not discussed at the beginning of the shift. If you are set-up - complete the inspection and move to the "priority".

Bundle Markings
Tubes marked in white are for reference during inspection process.

Add these if needed.

Tubes marked with white X across tube is a previous plugged tube (s).
Tubes marked in yellow are damaged, warped, bent but do not need repairs.
Tubes marked in red have mechanical damage and should be plugged this TAR.
Tubes marked in red contain wall loss/corrosion and should be plugged this TAR.
Areas marked in red on gasket surface need repair this TAR.

Vertical lines marked in white are baffle cut-lines.
Horizontal lines marked in white are baffle cut-lines.
Outline marked in yellow on tube sheet denotes area of wide spread general corrosion.
Tubes marked in red were pulled tube samples. Plugs required.

When Mistakes Occur
Magnetec inspector "A" has completed an inspection and maybe missed a tube that should be plugged and you have found it and want to get it plugged, or the ironworkers dropped the bundle and a tube should be plugged for mechanical damage.

This single change will require the following:

1) Should be referenced on the field report copy. YOU WILL NEED TO DOCUMENT THIS.
2) The Data Pages (.csv) may/should have to be updated to show this change. YOU WILL NEED TO CHANGE THESE FILES.
3) The tube sheet photo will need to be retaken with new plug tube circled in red and a photo of the M/D should be taken. YOU WILL NEED TO TAKE A IN-FOCUS PHOTO'S AND COPY TO REPORT FOLDER.
4) You will need to change the .TS file. YOU WILL NEED TO CHANGE THIS FILE.
5) You will need to .PDF the changed .TS file. YOU WILL NEED TO DELETE OLD FILE AND .PDF NEW FILE.
6) You will need to change the plug map. (.csv, .TS, .JPG) YOU WILL NEED TO CHANGE ALL THREE FILES.
7) You will need to add the change total on the HX. YOU WILL NEED TO CHANGE THE HX PAGE.
8) You will need to change the bundle. YOU WILL HAVE TO CHANGE THE TAG OR MAKE CHANGES TO EXISTING TAG.
9) Of course you will have to circle the tube in red on the tubesheet. YOU WILL HAVE TO GET A RED MARKER AND CIRCLE THE TUBE RED.

So we can see that a single change of one plug will require 9 changes by you the inspector. Obviously more and/or different findings will require changes also.

If you are going to alter a report or have additional findings it is your job to sequence through the changes.
As stated above this will be 9 areas where information must be altered.

Do not simply write - plug row XX tube XX on field copy and walk away. Your work is far from over.

Defect Locations
All defects have locations.

Please confirm on your field reports, finals, summaries, etc. that there is a referenced location.

Note: If you use the MD500 function to enter wall loss and you do not use the locating arrows then the software will give a random/meaningless number. This will have to be changed in the final report to an actual location.

One Man Band
As we all know there is a One Man Band (OMB) option in the MD500 software so that you can run/record an inspection by yourself.

Please take the appropriate amount of time to learn this function. You are expected to understand it's use, operation, procedures for the collection of Edata by yourself.

Specifics such as full head phones, ear buds or just computer microphone to hear prompting voice (Magnetina) is up to the user.

We will always attempt to collect Edata for all inspections performed.

Archos

As we all know there are Archos 605 video recording unit to use with our video probes.

These unit allow for a long video recording to be made of tubing, defects,etc.

The video information can then be rendered into Windows Movie Maker for our clients. (look in your accessories folder)

Please take the appropriate amount of time to learn to use the Archos unit and process a film. You are expected to understand it's use, operation, procedures.

You can assume that any time you have suspect signals to take some form/length, etc of video.

Side note: Remember that when taking video to try and blow out the tubes prior to video. This makes the video very clear and also then we are not just recording video of water in the bottoms of tubes. Defects on the bottom of the tube are masked by the water. Don't think you will be able to see through the water and get a good video. Also, remember to move the camera head very slowly. Pulling way to fast does not gather any good video data. You should be pulling/gathering video data at a rate 1/2 as slow as RFET. Do not pull to fast, rotate the camera, push in/pull out, record your face,etc.
Once you find the object of interest, rotate the camera so up is up and down is down, pull as slow as possible and record that million dollar data.

We will always attempt to collect video for all suspect signals of inspections performed.
Reports
As we all know the field/final report is part of our job and must be completely filled out.

RTS - Return to service is not really filling it out.

Return to service and keep up regular cleaning cycles - wont cut it either.

A complete report must be forwarded to the DC. It is not their responsibility to interpret and document an inspection.

You as the tech will be given 1.5 hours max to complete a report. You will not hide away from other work "doing your reports" as other inspections are being performed. You will not take a full day to complete a report.

Reports are to be issued no more than 24 hours after inspection. You can not make arrangements with the plant rep. for something different. You can not deviate from the policy based on an agreement with the plant rep.

You can not wait for additional info to issue a report. You will issue a report and as additional info become available you will re-issue.

Who is this written for - YOU

Daily Duties
You are expected to spend at least two hours every day working on equipment when not on a job site.

This would include the following:

Standard setup on Carbon steel - Tube and Air
Standard setup on Non-ferrous tubing - Conventional ECT
Standard setup on Carbon steel tubing - RFET
Non-standard setup on plate - Ferrous / Non-ferrous
Video probe setup - VIT equip
Video probe setup - MII equip
Recording on Archos / Movie and file transfer from Archos unit.
MD500 software package
Tubesheet software package
Summary / Report software package
Microsoft - Word, Exel

The above would include the following Equip:

Zetec - MIZ 40
Zetec - MIZ 27
Zetec - MIZ 22
Hocking 2
Hocking 2200
Nortec 19
MD500 S or DF
MD500 RFET
Everest VIT - Video Probes

As an inspector you are expected to able to perform all operations with this equipment and manipulate all functions. You are expected to be able to setup all basic inspections types in a timely manner as would be expected during a TAR. It is your responsibility to understand fully the complete hook up and operation of our software package. You must be able to and familiar with the upload and download functions of the software package.

You are expected to be a expert at all functions of your job duties. There should be not need for instructions.
It would be expected that you may need instruction as you learn the equip however we will not be doing instructions on job sites.

You can expect changes in your compensation package (Salary, hourly, bonus's) based on your demonstrated abilities. If all you can really be expected to do is pull then your compensation is expected to match your contributions and ability to the company.

This involves you and only you - it does not mean being directed, guided by, informed, shown by other personnel.

If you are fully aware of the above listed equipment, software then excellent. Please start over. When done start over. When done start over .....

If you are not located at offices please grab a cup of coffee, heat up our rig and perform operations listed above.

**With regard to inspection process the following will be considered standard procedure.**

1) We will take data for every inspection performed. This includes any inspection performed from initial, re-inspection, post failure inspection, etc..

Your job as an inspector is to gather as much information as possible. The client as no input with regard to the information gathering process. You must know what is the correct amount.

2) All edata will be as clean as possible. We will not inspect half a bundle with a shorted or unhooked probe.
3) All data sets should have some form of calibration. Pound a dent into the tube.
4) All projects will be complete and fully documented.
5) All projects are to be full analyzed and documented. This includes the highlighting a defect on a tube run.

The hocking, nortec, hand helds are for review of single tube sections or defects. If these are going to be primary inspection scopes you will record the data from these.

All edata will be uploaded to server ASAP after the inspection.

**Reporting:**

We all know the process, procedures, etc.

1) The client and you can not make a determination of when reports will be issued, how they will be issued, if they need to be issued, content of report, etc..

You will always generate some form of report. Even on one tube. You have no input with regard to these procedures. The client has no input with regard to these procedures.

You will fill out a field inspection report for every exchanger. You will follow the process established until instructed to do something else.

There will not be just writing on a old report and handing in.

There is no job on site that is more important than the collection of data which will be used for the report process.

**Fin Fans**
A quick review of row and tube numbering of fin fans.

As we all know the numbering of exchangers (fin fans) is a primary documentation and record keeping item.

All fin fans will be numbered with the top most horizontal row a being row one and consecutive rows numbered as we inspect downward through the header.

All tubes will be numbered from and length referenced from the inlet header box.

Tubes as usual will be numbered consecutively from left to right....eg. While looking at the inlet header the tubes will be numbered from left to right.

We have all been in situations where the inlet header box side is not available (no scaffold, no access, piping in way, etc) or it is more convenient to inspect from the return header box.

In these cases the tubes will be numbered from right to left which will yield a left to right sequencing on the report. (As referenced from the inlet header)

If old reports were numbered wrong make a note on the "Comments" line of the report.

**Tubesheet markings**

We will from this point mark all plugged tubes with an X on the tube sheet map.

This will help when these are not on the .CSV or visible in the pictures due to shading/night shots/poor picture taking.

All plugged tubes which are not in test pattern needs to be denoted on the .CSV's

Consider this as standard procedure.

Just to clarify, the procedure directed here is to mark an X with your paint stick on the plugs right there at the bundle to help identify them in the photos if needed and such.

**Lead Daily Emails**

If you are a lead on a job you will send in a daily e-mail to your plant counterpart/rep. with a brief description of the days work or inspection findings. This will happen every day and every time you are lead.

The e-mail may look like this. (This is an example only)

Good afternoon:

**Inspection Results:**

120E-40b - The RFET inspection found the tubes to be in good condition with only light corrosion being noted to either of the surfaces (I.D. or O.D.). We inspected around the failed/plugged tube and did not find any indications that would relate to the failure mode. Our assessment is the failure was due to a manufacture type defect and not a service related issue or based on a very accelerated corrosion.

31E-23 - The inspection found the bundle to be in good physical condition with no severe corrosion or mechanical issues which would limit service. Light mechanical damage was evident to support components but these will not affect the service.

We should have the XYZ bundle ready in the morning.

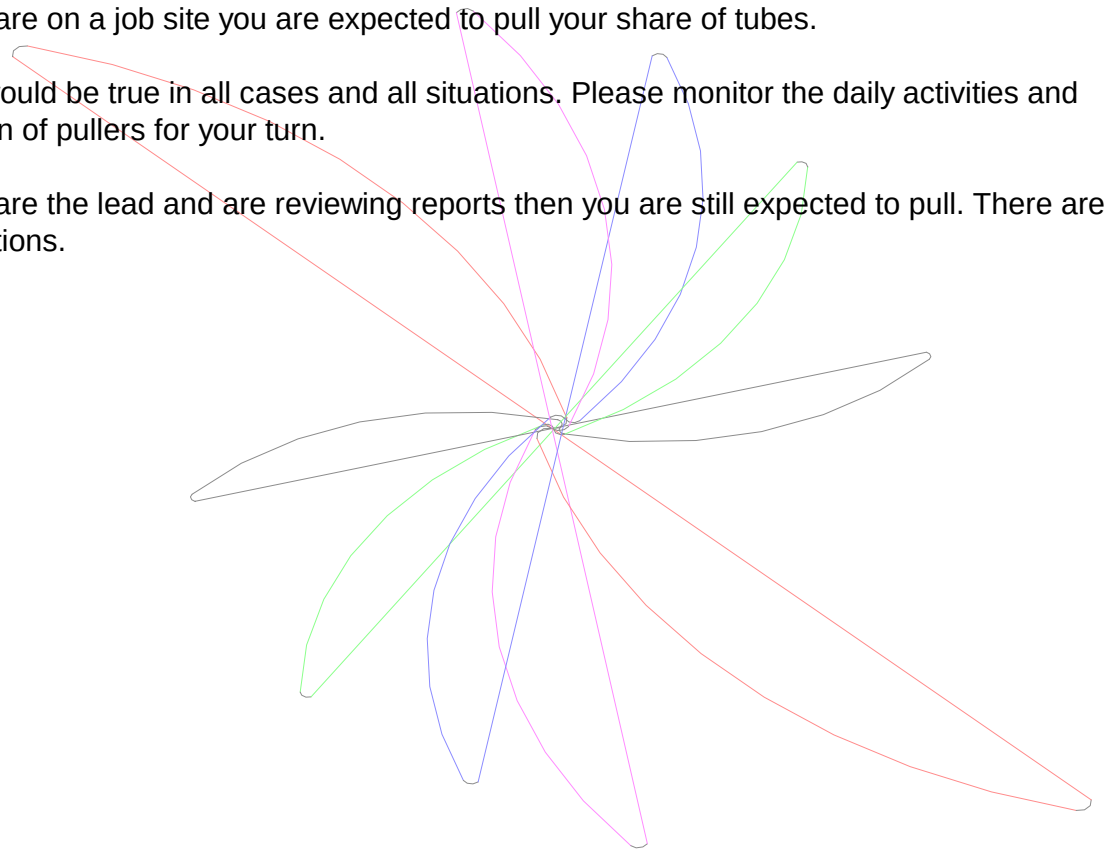
If you have any questions please feel free to contact my cell number.

**Job Site Duties**

If you are on a job site you are expected to pull your share of tubes.

This would be true in all cases and all situations. Please monitor the daily activities and rotation of pullers for your turn.

If you are the lead and are reviewing reports then you are still expected to pull. There are no exceptions.



# Data Central Duties

Any/all files which are used by data central (Supplementals, etc..) are not to be distributed.

ReportTS
ReportFF

This includes - Our employees, Clients, etc..

Not only can they not be used by other machines (Registration is wrong) they are to be used only for final reports generation by you.

You may only distribute files as completed finals in .PDF format.

When asked for a template please respond that these files are controlled. Ask Ethan.

Answering Shop Phone
Please perform the following when directing a phone call to the back. This is in conjunction with greeting to caller.

1) Speak clearly, loudly, slowly.

2) Say: <insert name here> (eg. Jeremy) you have a call from Albert Einstein from Oak ridge laboratories on line 2

3) Repeat.

4) Monitor for pickup. If no pick up after 30 Sec. Get back on and ask if they want to hold longer.

5) After another 30 Sec. ask to take a message.

6) Remember the employee in question may have left the building.

Creating File Boxes
When Data Central, creates a file box for any one job, we also issue a hard drive to that job. From this point forward, that information will be logged onto the Job Tracking Form.

Under the "Comment" column, we will insert a comment box with the hard drive # (Hard Drive # 1, Hard Drive #2, Hard Drive #3, ect....)

It is the data girl on the job or lead inspector's job (if no data girl) to make sure the file box is complete when it returns to the shop including the hard drives being there.

Data central will be in charge of checking the hard drives in and out.

On the Job Site

The data central is in charge of completing field reports in the field. You must review the report for context and content. If something does not make sense, reword it in a way it does.

Data central will be responsible for submitting and completing time sheets daily.

Data central will maintain and email the hx form to the client twice daily. They will also upload all reports and files to the MII app. All correspondence to the client will be copied to data central and in pdf form.

Data central may be asked to submit work hours for those on the job site. Only submit hours for those who have given you a written copy of their hours and what they worked on.

Data central may also be responsible for keeping track of temps on the job site.

Data central when on the job sites will make sure the file boxes come back to the shop complete with all electronic files, bundle histories, gig sticks, hard drives, cds, etc.

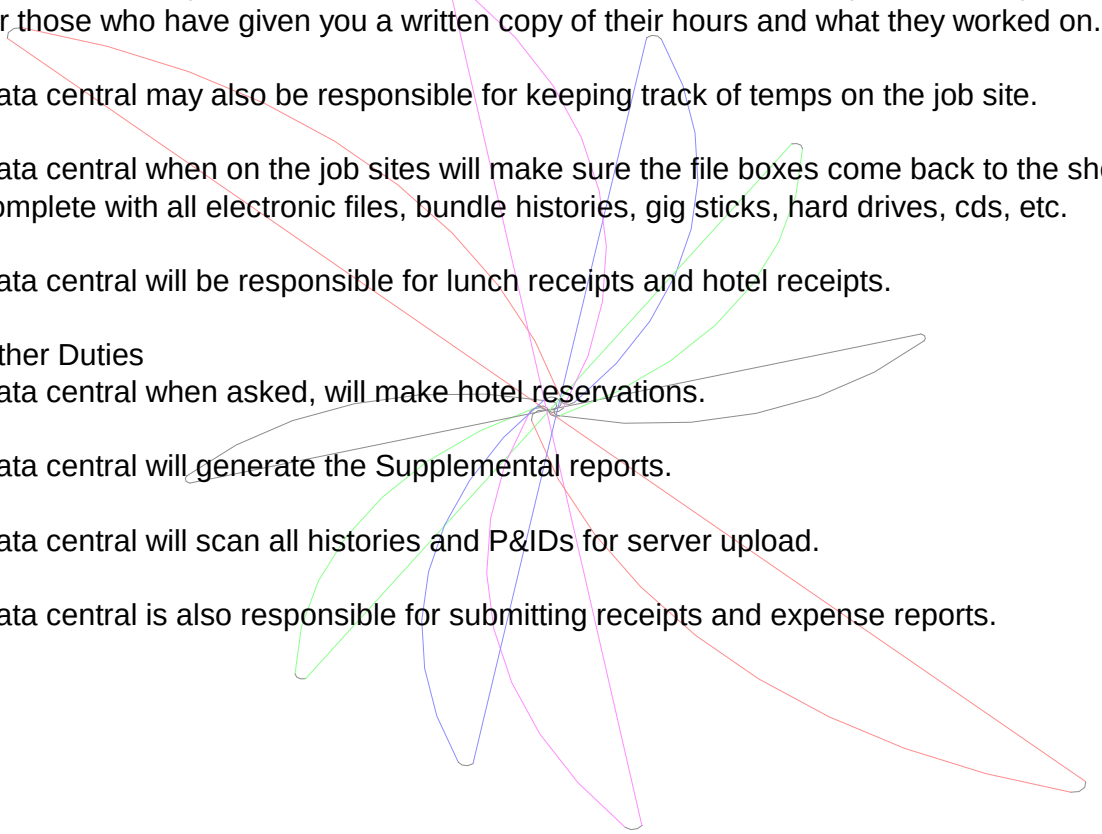
Data central will be responsible for lunch receipts and hotel receipts.

Other Duties
Data central when asked, will make hotel reservations.

Data central will generate the Supplemental reports.

Data central will scan all histories and P&IDs for server upload.

Data central is also responsible for submitting receipts and expense reports.



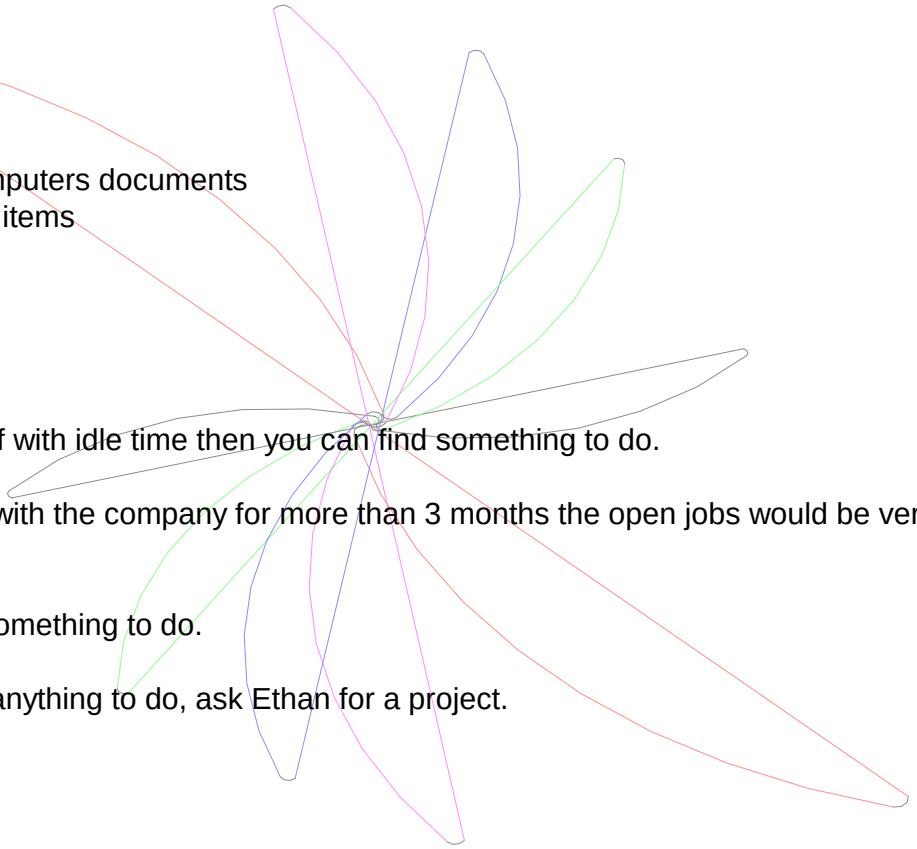
# Employee Tasks

EMPLOYEE TASKS:

If you are at a TAR, or in the office or in the shop you need to be active completing tasks for Magnetec.

This could/include anything:

toilets
picking up
filling coolers
cleaning your rig
cleaning your computers documents
prepping the next items
cleaning probes
fixing broken stuff
cleaning windows
etc..., etc..., etc...



If you find yourself with idle time then you can find something to do.

If you have been with the company for more than 3 months the open jobs would be very apparent.

There is always something to do.

If you don't have anything to do, ask Ethan for a project.

# Daily Projects via Email

Daily Projects VIA Email

Some of you may get a list of projects for the day.

Please respond at end of day that the projects are complete.

So, Cut and paste into new email the list and mark complete at end of line. As follows:

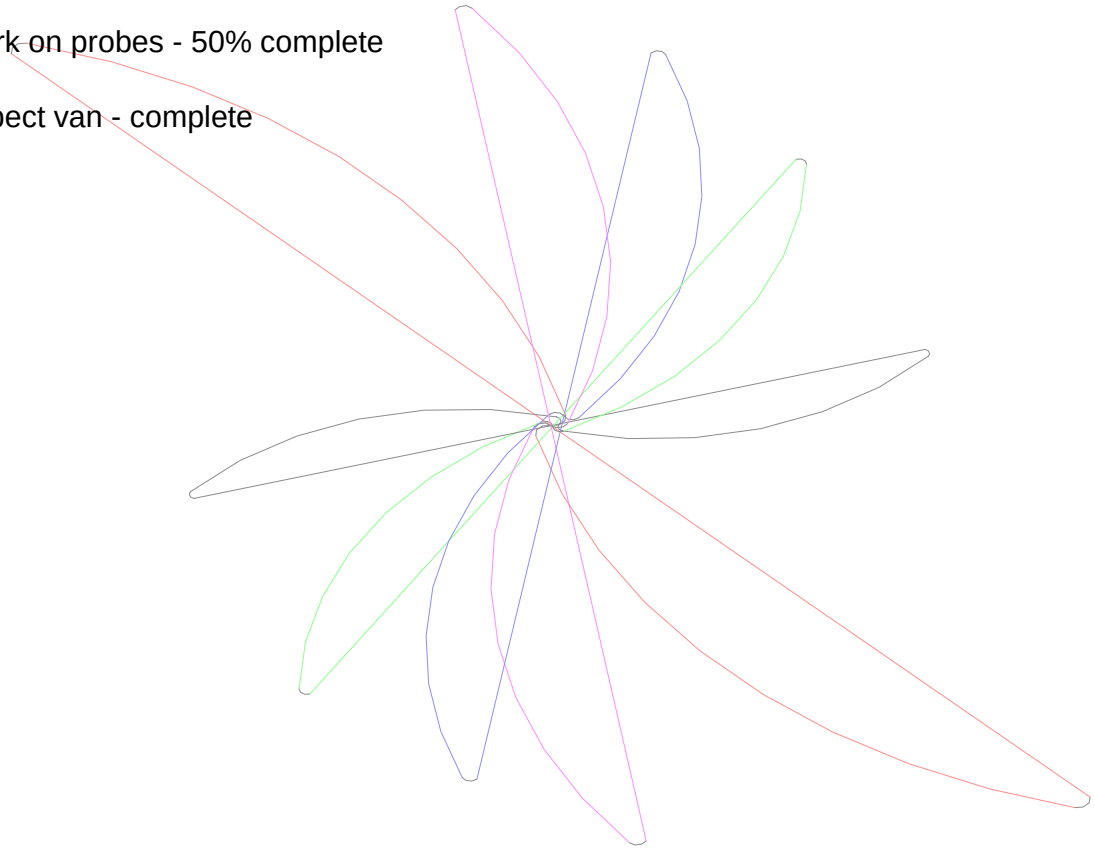
---

E.G..

Clean bathrooms - complete

Work on probes - 50% complete

Inspect van - complete



# Shop Activities

Shop Activities:

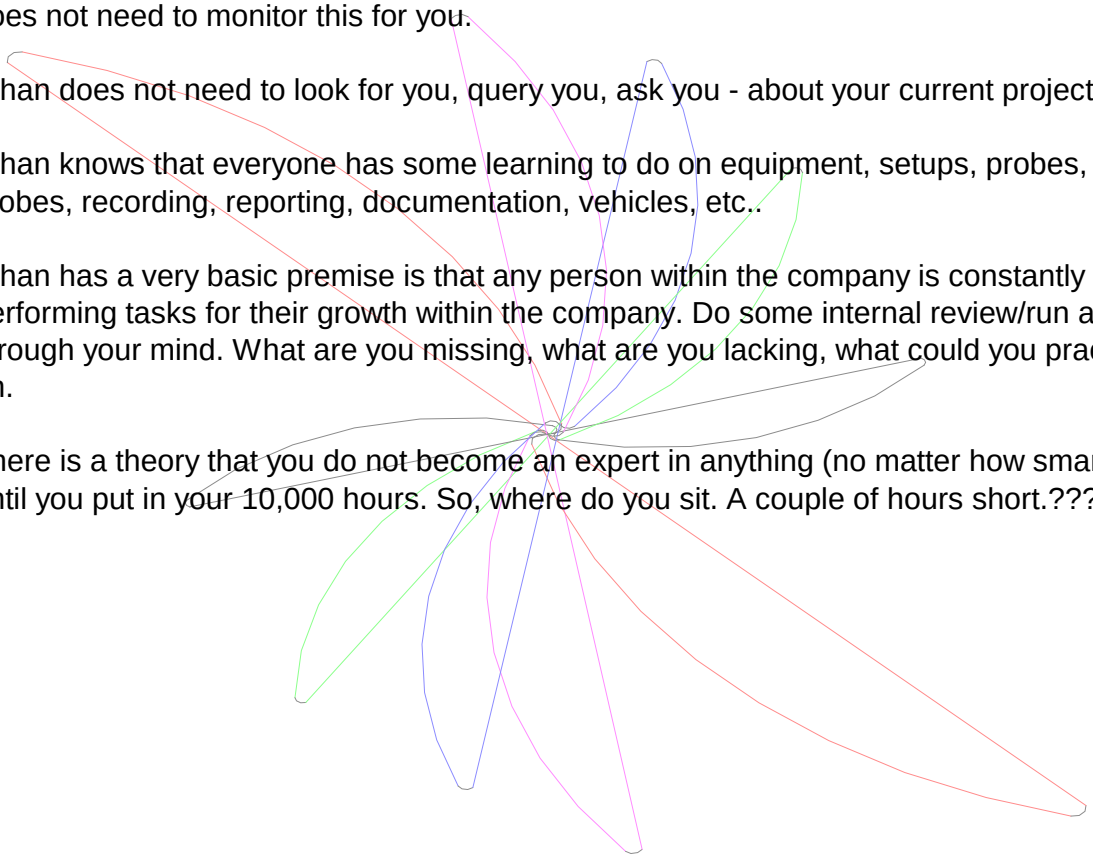
You need to be monitoring your time at the shop and elsewhere and make sure you are always actively working on a task, project, R&D, repairs, upkeep of company assets. Ethan does not need to monitor this for you.

Ethan does not need to look for you, query you, ask you - about your current project.

Ethan knows that everyone has some learning to do on equipment, setups, probes, video probes, recording, reporting, documentation, vehicles, etc..

Ethan has a very basic premise is that any person within the company is constantly busy performing tasks for their growth within the company. Do some internal review/run a job through your mind. What are you missing, what are you lacking, what could you practice up on.

There is a theory that you do not become an expert in anything (no matter how smart you are) until you put in your 10,000 hours. So, where do you sit. A couple of hours short.???



# Communication

1) If you are on the payroll for any day you will call in to Ethan at either 10:00am or 2:00pm to communicate such information as  job progress, problems, equipment needs, issues, etc...

Assumably there will be a better time than others to phone in and times could shift somewhat.

If call is not answered leave a message. Note: if you call and there is no answer leave a message.
There are many times that if no message is left the call is not considered urgent and Ethan will wait until after that days shift to complete the call. If it is urgent leave a message.

2) If you are a member of a larger crew the phone in duty will be covered by the job lead. ("lead"  is person who is in charge of the specific job and is the primary information path from Magnetec to the plant personnel.)

Our whole job is based around communication with the plant personnel and our own employees.

You need to talk/discuss/communicate with everyone associated with a job task.

This obviously includes the plant, our people, outside vendors, etc..

What Goes to Ethan

1) You need to forward all information from clients to Ethan. This includes but is not limited to: jobs, problems, questions, cost, technical information, industry info, safety concerns, etc.

2) Any aspect of the company that affects either clients and/or company (Magnetec) personnel need to be forwarded to Ethan. (Verbal and/or E-mail correspondence)

3) If you have individual concerns that affect the company they need to be forwarded to Ethan.

Ethan expects to know all specifics that effect the company. You must forward all correspondence.

If/when you call Ethan you will leave a detailed message with regard to the call.

Ethan will respond to a call when time permits.

If there has been a death, accident, IRS notice, etc. you may text Ethan with 911.

If you call and do not leave a message Ethan will assume there was no real need for the call and will not return the call.

Ethan will be kept in every loop of the company operations and communication

If you call and do not leave a message Ethan will assume there was no real need for the call and will not return the call.

Ethan will be kept in every loop of the company operations and communication.

The following info will be directed to Ethan:

1) Inter-company communication
2) Client/Customer communication
3) Vender communication
4) Supplier communication
5) Extraneous service communication
6) Employee communication

This basically means if you in any way discuss, text, E-mail, call, send letter, etc. any information which impacts the company in any way Ethan will need to be contacted. (E-mail it)

Assume the following:

EVERY E-MAIL YOU SEND WILL HAVE ETHAN ATTACHED. DO NOT SEND AND COMPANY CORRESPONDENCE TO ANYONE THAT DOES NOT HAVE ETHAN ATTACHED.

EVERY E-MAIL WILL GO TO 2 PEOPLE - The recipient and Ethan.

# Electronic Communication

Email, Internet and Other Electronic Communications Policy
Email
Magnetec Inspection, Inc. assumes no responsibility for the content of e-mails for maintaining their privacy, and Magnetec employees have no expectation that such privacy will be maintained. Magnetec reserves the right to review, audit, interpret, access and disclose any messages created, received or sent over the e-mail system for any purpose. Confidentiality of e-mail communications should not be assumed.
No e-mail messages should be created, sent or forwarded which may be deemed to be intimidating, hostile or offensive in nature, or which are discriminatory on the basic of race, color religion, sex, nation origin, sexual orientation, disability, or any other basis that is unlawful under applicable state and federal law. Nor should any obscene, profane, abusive or offensive language be transmitted.
Any employee who violates this policy or uses the e-mail system for improper purposes as determined by management shall be subject to discipline, up to and including discharge.
The consequences of violating email or internet policy;
1st offense results in and oral warning and documentation placed in your personnel folder
2nd offense is written warning filed in your personnel file
3rd offense results in a 3 day suspension and documentation placed in your personnel folder
4th offense is termination.
Sending Emails
Do not use/send company information with your Yahoo account/E-mail address. (ewethanwilliams@yahoo.com).

Use only your Magnetec account (ew@magnetec-inspection.com)

Do not use any form of your personal account to send company info. (bob@someaccount.net)

You need to review your account every day. Read and understand every E-mail.
INTERNET, INTRANET and EXTRANET GUILDELINES
As with e-mail, Magnetec Inspection, Inc. provides Internet access solely to facilitate the conduct of Magnetec's business. Access to the Internet, Intranet or Extranet may be limited at the Magnetec's sole discretion. Employees are expected to use the Internet, Intranet, and Extranet at all times in a manner that benefits Magnetec and not for personal use.
Employees should have no expectations of privacy for their use of the Internet, Intranet and Extranet and Magnetec may monitor employees to insure compliance with this policy. Use of the Internet, Intranet, and Extranet in a manner which violates this policy as determined by management may result in disciplinary action, up to and including discharge (These are the same disciplinary actions as mentioned above in email usage section). An example of conduct which is specifically forbidden includes, but is not limited to:
• Using the Internet, Intranet or Extranet for personal gain or for commercial activity unrelated to Magnetec.

• Sending, reviewing or viewing material or information that is threatening, intimidating, hostile, harassing, offensive or discriminatory on the basis of race, color, religion, sex, national origin, sexual orientation, disability or any other basis prohibited by applicable law. In addition, the receipt of such material and/ or showing such material to co – workers is strictly prohibited.
• Using the Internet, Intranet or Extranet for any activities not specified here that are in violation of federal state or local laws.

Phone Usage
You are expected to work during work hours. Cell phones are not to be used to communicate (calls or texts) with boy/girl friends, significant others, family, etc. unless it is an emergency.

If there is something that will require your attention, excuse your self for the day and report to work the next day.

You are expected to keep your cell phone available to accept work calls.

When in a plant, cell phones are not allowed in the Units.

There is absolutely no texting, surfing the web, using social media, watching video, tv, etc. or emailing while driving a company vehicle. Phone calls can be made using only a hands free device.

Failure to comply with these rules will result in the following disciplinary actions:

First offense- oral warning and documentation placed in your personnel file.
First offense for using the phone without a hands free device while driving - Termination
It will be assumed if you are not using a hands free device that you are texting, checking email, using social media, watching video, movies, ect.

Second offense- written warning placed in your personnel file

Third offense- Suspension without pay for 1 week and documentation placed in your personnel file

Fourth offense - Termination

Social Media

Do not post on any social media site any pictures, status, location or information of any job site you are working on. If you must post you may only say you are at work and do not tag or hashtag the name of any facility you are in.

Magnetec Inspection, Inc. takes our client's privacy seriously and if you are found to have

# Email Communication

Do not use/send information with your Yahoo account/E-mail address.
(**ewethanwilliams@yahoo.com**)

Use only your Magnetec account (**ew@magnetec-inspection.com**)

Do not use any form of personal account form to send info. (**bob@someaccount.net**)

You need to review your account every day. Read and understand every E-mail.

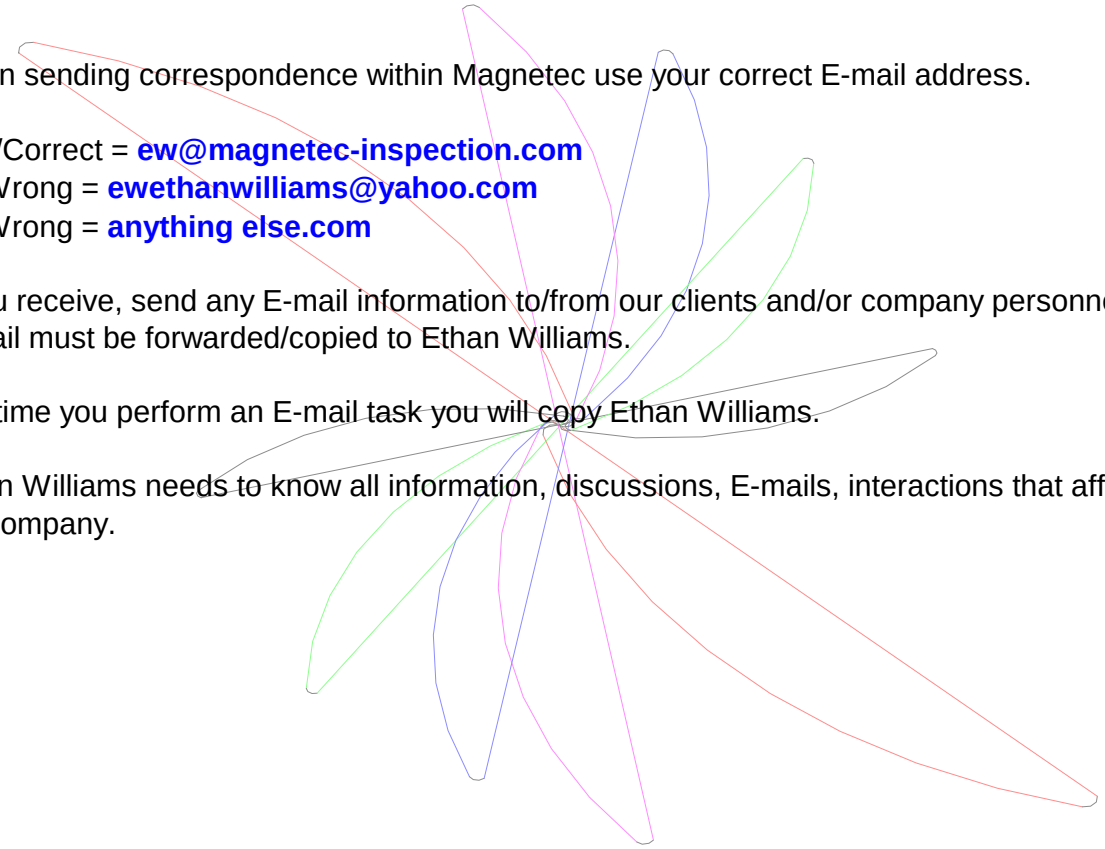
When sending correspondence within Magnetec use your correct E-mail address.

YES/Correct = **ew@magnetec-inspection.com**
No/Wrong = **ewethanwilliams@yahoo.com**
No/Wrong = **anything else.com**

If you receive, send any E-mail information to/from our clients and/or company personnel the E-mail must be forwarded/copied to Ethan Williams.

Any time you perform an E-mail task you will copy Ethan Williams.

Ethan Williams needs to know all information, discussions, E-mails, interactions that affects the company.



# Client Communication

As our Clients and Customers come across additional work we need to have them contact the shop for planning. In this way we can insure the resources and accounting of the job is completed.

How many times do we get this "Hey we got an extra bundle for Y'all"

This is great and is what we want but many/most times requires additional resources and/or needs to be discussed with timing, personnel, costs, PO#'s, etc  being referenced.

The following will be adhered to:

All new jobs, add-ons, future work, job scope changes, etc. will be directed to the shop (Ethan Williams).

This is to be said to the Plant:

"The work is appreciated, however you will have to contact the shop for this. My directions for this work will have to come from the shop after you have made contact."

As far as the shop is concerned, there is no job until it goes through the shop.

You will not do, prepare for, complete, add-on, confirm, agree to, any job until directed to by the shop.

If you arrive in the morning and the plant says "The add-on is ready" you simply say, I have no direction from the shop and you will have to call prior to my completion of the task.

Bundle Calls/Condition

It is the responsibility of the lead inspector on the job to make the final call for a specific piece of equipment and or tube. If you are not the lead inspector do not start giving your impression of the wall loss, corrosion's, defects, depths, etc.. to the client without the lead's consent.

There must only be one single voice coming from Magnetec with regard to the final calls. This includes even if you're sure of the corrosion and you normally are the lead. If you are not the lead then the following statement will suffice for the customer.

"You will need to talk with XYZ as he has the final disposition for this bundle and he has reviewed the results".

We can not have "oh that's like 50%'s wall loss" going out before the lead has time to react.

Use professionalism when communicating with the client.

Do not add information about your schedule, company resources, company schedules, etc..

There have been many circumstances where our clients hear " we are not available" when you describe your personal schedule.

Do not make comments about the whereabouts of other inspectors arriving to the job a few days into the job. Example, Inspector A will be here in Toledo after he finishes a job in Whiting. The client may not agree to pay the travel charges from the shop to Toledo (standard billing procedure), as Inspector A is coming from Whiting.

If you arrive at a plant and you need to get additional paperwork, drug test, find equipment, or for any reason which takes you from the facility you must contact your plant rep.

Call and tell the plant contact your plans. Do not assume this is done for you.

Emailing the Client

We use a standard e-mail salutation for our clients when reports, etc.. are sent out.

In addition to the client, Ethan and the DC are to be copied on all reports and hx forms sent to the client.

In addition there should always be comment on any changes, alterations, issuance, redactions, additions, etc...

This would not be the case for re-occurring HX forms, daily correspondence during a job, as these would be on-going issuance.

Something such as follows. (colored text shows additional comments as examples)

Good Morning,

Attached are the Field ECT Inspection Reports for the exchangers we inspected. You will receive an additional email with the Supplemental ECT Reports from the Corporate Office at a later date. This report will contain additional discussions, reliability calculations, remaining life, corrosion rate graphs, video screen prints and videos. This additional report does not alter/change results of collected edata represented in this issued report. Please contact me with any questions or comments via email, at 815-802-1363 or our toll free number 855-802-8480.

We are happy to have served your inspection needs during this shutdown and appreciate all of the help from the <Enter clients name here> inspectors and personnel. We hope you will consider us and look forward to working with you in the future for any Eddy Current inspections you may require.

The attached report is reflective of the changes from a 25% to 100% inspection scheme

The attached report is reflective of the changes from a 25% to 100% inspection scheme. Please replace old report of 1/1/13 with this new copy.

The HX form is a final copy which includes the inspections performed after the main work scope was completed but is considered as part of the job. Please replace the old version of 1/1/13 wit this version.

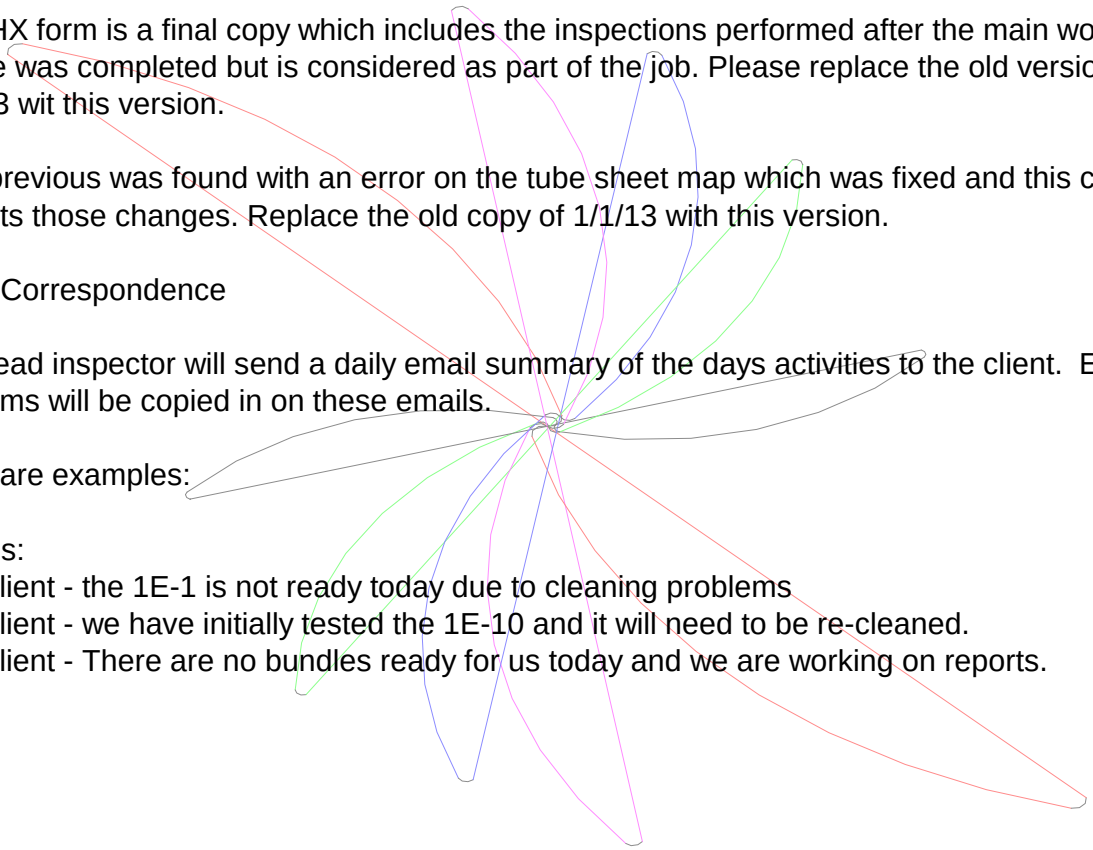
The previous was found with an error on the tube sheet map which was fixed and this copy reflects those changes. Replace the old copy of 1/1/13 with this version.

Daily Correspondence

The lead inspector will send a daily email summary of the days activities to the client. Ethan Williams will be copied in on these emails.

Here are examples:

Emails:
Mr. Client - the 1E-1 is not ready today due to cleaning problems
Mr. Client - we have initially tested the 1E-10 and it will need to be re-cleaned.
Mr. Client - There are no bundles ready for us today and we are working on reports.
etc..



# Passing Client Info

All info from a client which involves Magnetec must be passed on immediately to Ethan.

This includes:
Upcoming jobs
Emergency jobs

If you get info you will:

Call Ethan
Leave a message with Ethan
Send an email to Ethan
Text Ethan

---

For those in question:

If you call Ethan and he does not answer - leave a detailed message.

What is a detailed message:

A message which has all the pertinent info.
Fully describes the information content
Has all contact info and numbers
Has any timing which is important
Describes the job details

Ethan's policy is to not answer/respond to a call with no info.

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If a client discusses an upcoming job you must say to them the following:

You will need to contact Ethan and discuss this with him.

# American Express

1. Your American Express card is to be used solely for business purposes. (Hotel, gas for company vehicles, oil change for company vehicle, etc.) If you use your card for personal reasons, your paycheck will be docked for the charges.

2. You must save every single receipt for any charges you make. You must label what the charge was for on each receipt. Example: 001-14 MPLA Hotel If you charged gas, you must put what vehicle number it was for, what job number it is for and the current mileage reading of your vehicle.

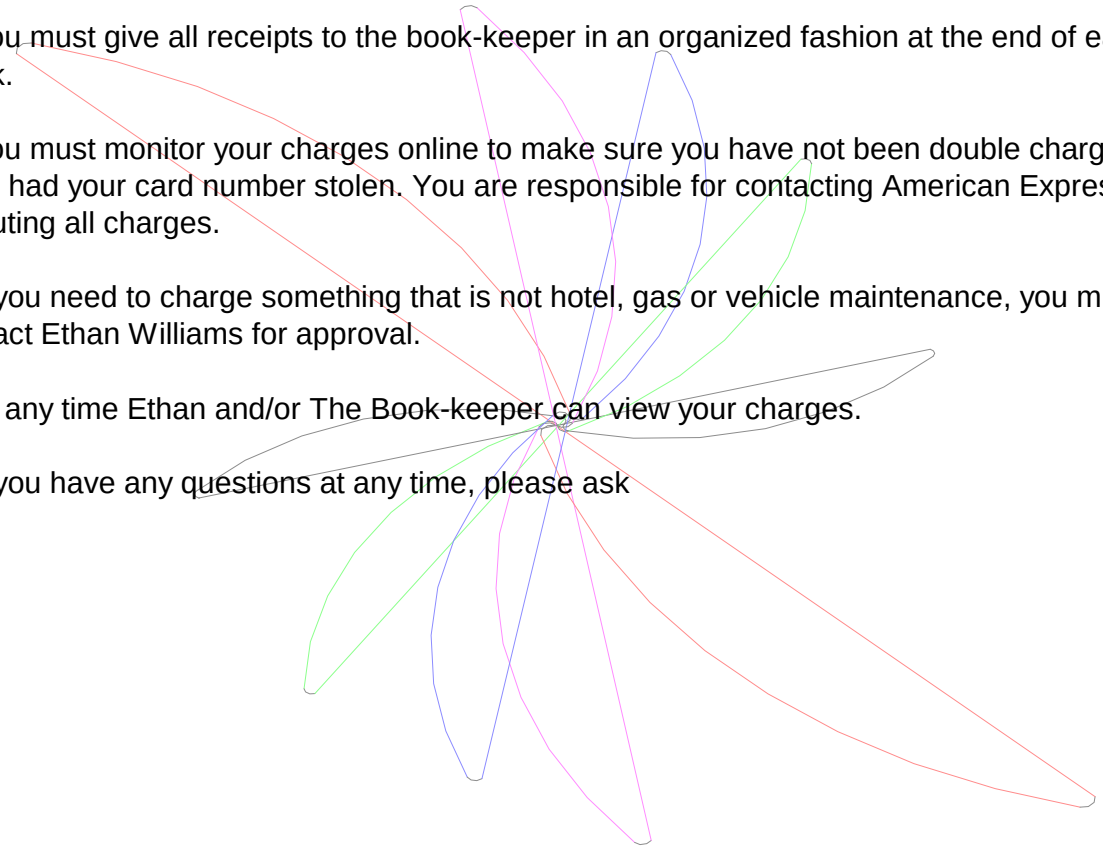
3. You must give all receipts to the book-keeper in an organized fashion at the end of each week.

4. You must monitor your charges online to make sure you have not been double charged or have had your card number stolen. You are responsible for contacting American Express and disputing all charges.

5. If you need to charge something that is not hotel, gas or vehicle maintenance, you must contact Ethan Williams for approval.

6. At any time Ethan and/or The Book-keeper can view your charges.

7. If you have any questions at any time, please ask



# American Express Purchases

If you carry a company card you may purchase items as required to complete the process of a job.

This would be billable gas and hotel charges to a specific job.

If directed by Ethan, you may purchase lunches, supplies, disposables for a specific job. These will need a receipt as always signed by Ethan.

It is your job to turn in all receipts charged to your American Express weekly.

If you are in a company vehicle, you may purchase re-occurring service items. These would generally be oil changes, wipers, belts. Major items need to be approved prior to work being performed and/or items being purchased by Ethan.

As we try to buy items such as office supplies, safety supplies, etc.. in bulk these should be purchased on a need basis when your direct supplies run low on a job and the make up/re-stock being performed with shop bulk supplies. Michelle will randomly ask for lists on specific items to be purchased in bulk. Please respond to these requests if you need supplies.

Many purchases need to get approval prior to purchase.

Items such as R&D, development, equipment repair, capital improvements, etc. need to be approved prior to purchase by Ethan.

The company policy is there is to be no use of the American Express card for personal purchases.

Charges to the card are for company purposes only.

All receipts that are not for gas or hotels will be going to Ethan for his signature, if you have not been authorized to purchase something it will be deducted from your pay check as a personal item purchased with company funds.

If you are in doubt, DO NOT purchase the item.

# Purchase Tracking

Magnetec/Shop:
1) All purchases (Not DC) that involve Magnetec made from the main shop (Bradley) will be made on the newly acquired PNC bank credit cards. These cards and all associated purchases and accounting are being handled by Grant.
2) There are two, 3 ring binders that will be utilized to control purchases they are “Shop Purchase Book #1 and Book #2. All purchases for any Magnetec item will flow through these books. The sequence for purchases are listed below.

• A needed purchase will be written down into/on of the books and upon approval they will be purchased. The actual purchase will be performed by one person approx. once a week for the listed items.
• The receipt will be put into book for retention and to confirm and track purchase.
• A report will be generated for these purchases and given to Jennifer for tracking in quickbooks.
• The card may be issued to another person, however all receipts for purchases will be put into book ASAP after return to the shop.
• The card will remain in book at shop.

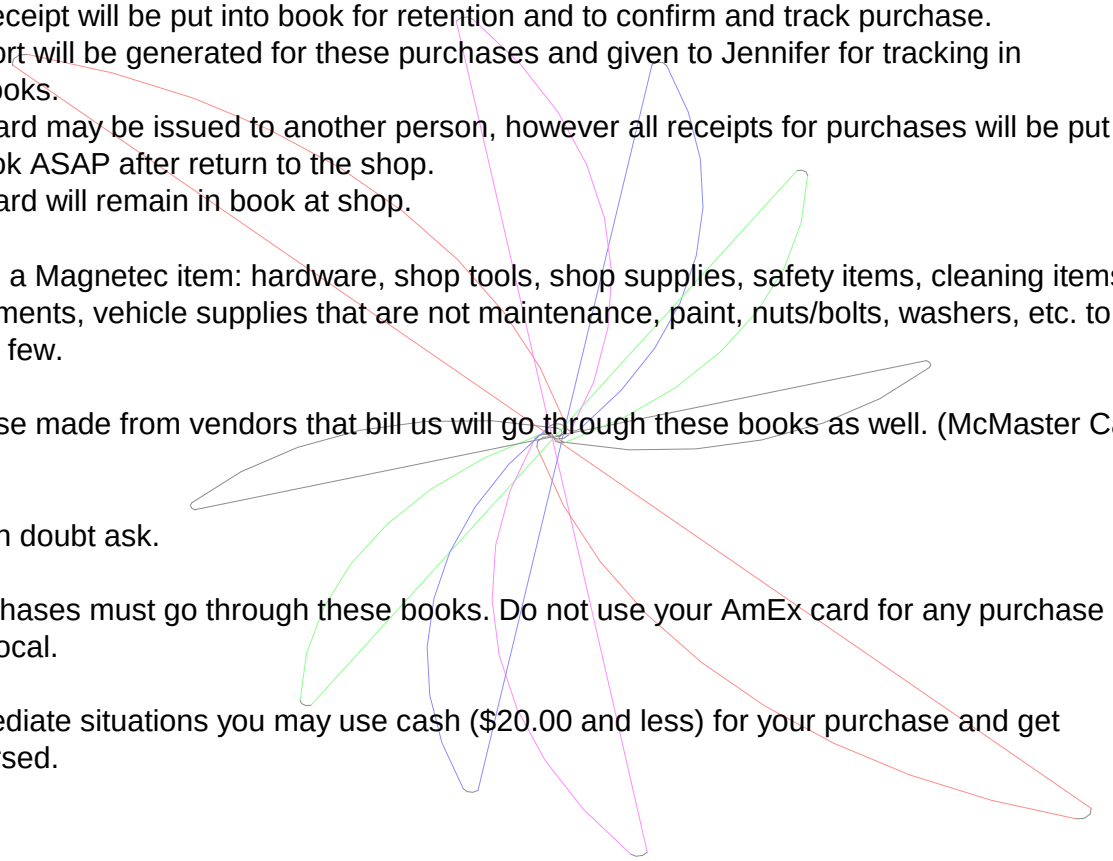
What is a Magnetec item: hardware, shop tools, shop supplies, safety items, cleaning items, refreshments, vehicle supplies that are not maintenance, paint, nuts/bolts, washers, etc. to name a few.

Purchase made from vendors that bill us will go through these books as well. (McMaster Carr, etc.)

When in doubt ask.

All purchases must go through these books. Do not use your AmEx card for any purchase that is local.

In immediate situations you may use cash ($20.00 and less) for your purchase and get reimbursed.



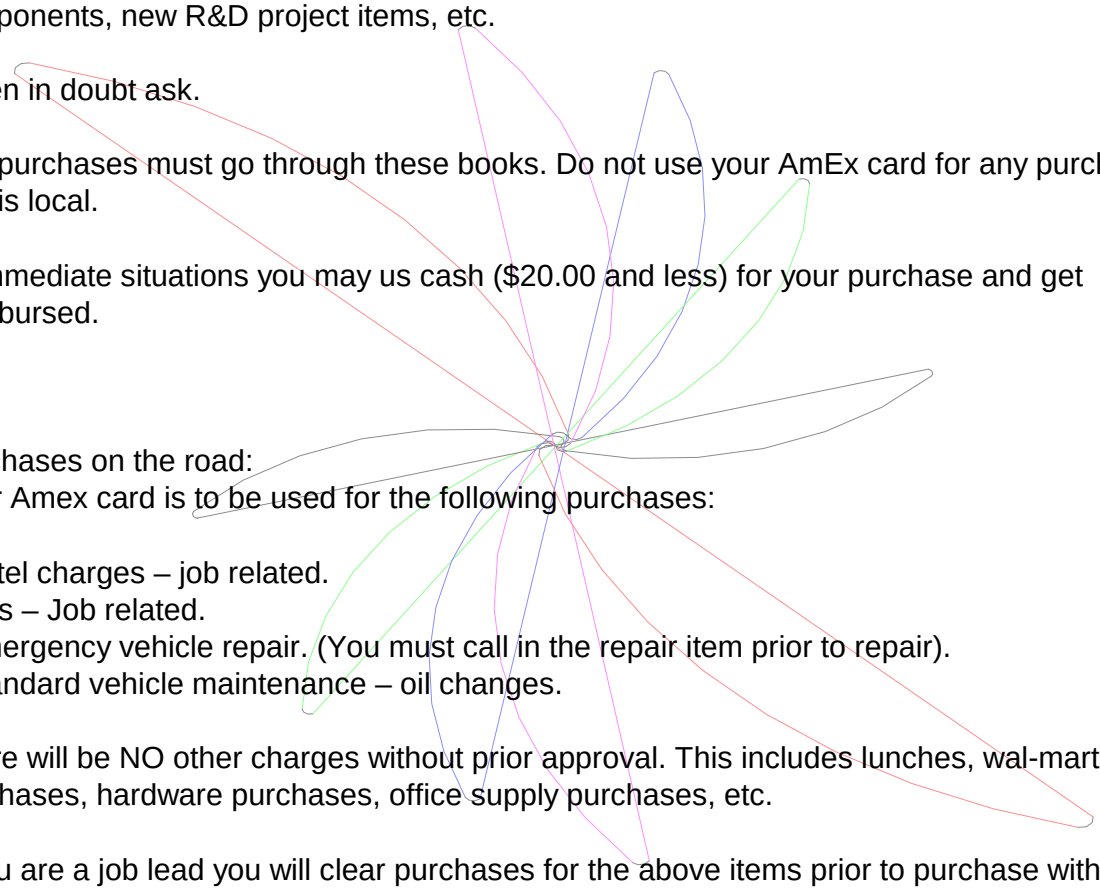
Evergreen/Shop:
1) All purchases that involve Evergreen made at main shop or on the road will be made from the AmEx card with the “evergreen account”. There is only one of these cards and associated purchases are being controlled and accounted for.
2) There is a 3 ring binder that will be utilized to control purchases which is called “Evergreen Purchase book #1”. All purchases which involve an Evergreen purchase will be controlled by this book.
3) The book will operate in the same fashion as the “Shop Purchase Book”.

What is an Evergreen item: Any item that may be put into a scope, any repair item that may enter a scope, power supplies, replacement parts for inspection equip., all passive components, new R&D project items, etc.

When in doubt ask.

All purchases must go through these books. Do not use your AmEx card for any purchase that is local.

In immediate situations you may us cash ($20.00 and less) for your purchase and get reimbursed.



Purchases on the road:
Your Amex card is to be used for the following purchases:

- Hotel charges – job related.
- Gas – Job related.
- Emergency vehicle repair. (You must call in the repair item prior to repair).
- Standard vehicle maintenance – oil changes.

There will be NO other charges without prior approval. This includes lunches, wal-mart purchases, hardware purchases, office supply purchases, etc.

If you are a job lead you will clear purchases for the above items prior to purchase with Ethan.

# Expense Reports

You will write job numbers on the receipts and put into the envelopes provided. You send the receipts in every week. The receipts will be tracked against the American Express bill.

Any item charged to your AMEX card must have a receipt.

Acceptable charges include, gas, hotel, oil changes.

If you are staying somewhere and you are doing multiple jobs YOU must break down the hotel bill into each job. Example: 2 weeks in one hotel 3 jobs. You must list the cost of the room(s) for each job - 2 days job 001, 4 days job 004 and 4 days for job 007.

You must put the mileage of your company vehicle on the bottom of your gas receipts along with your van #. We are trying to track repairs and be more efficient in retiring vans once they have reached a certain amount of miles.

Also, please keep any original paper work for repairs in your van.

MAKE A COPY OF THE RECEIPTS and send them to the bookkeeper. This allows you to make sure if something goes wrong with your van you have the original paperwork for any warranties that may have been issued.

Each receipt must have as much info as possible with regard to accounting purposes written on the receipt itself.

Job #
Account #
What it was for
etc.

Every entry should be as complete and outlined as possible. The only time a general/generic description can be used is when a large project which will have many entries is being expensed. (eg. build out of the M2)
This can be described as "parts/supplies for M2"

You can check your charges against the American Express statement by logging on to your account online.

If you have been double charged on your AMX please call them 1-800-492-3344 and tell them that you want to dispute a double charge on your bill. AMX will walk you through the process and hold that charge on your bill. Once you have done that add a NOTE to your receipts envelope and that you have contacted AMX. Jennifer cannot dispute a charge for you. The card holder must do it.

Make sure you put your name or initials on your receipts so we know who they came from.

Effective January 1, 2015 no emails will be sent asking for missing receipts or calling you to the front office.

Instead, that time will be used to deduct the cost of those items from your paycheck.

All receipts are to be turned in weekly.

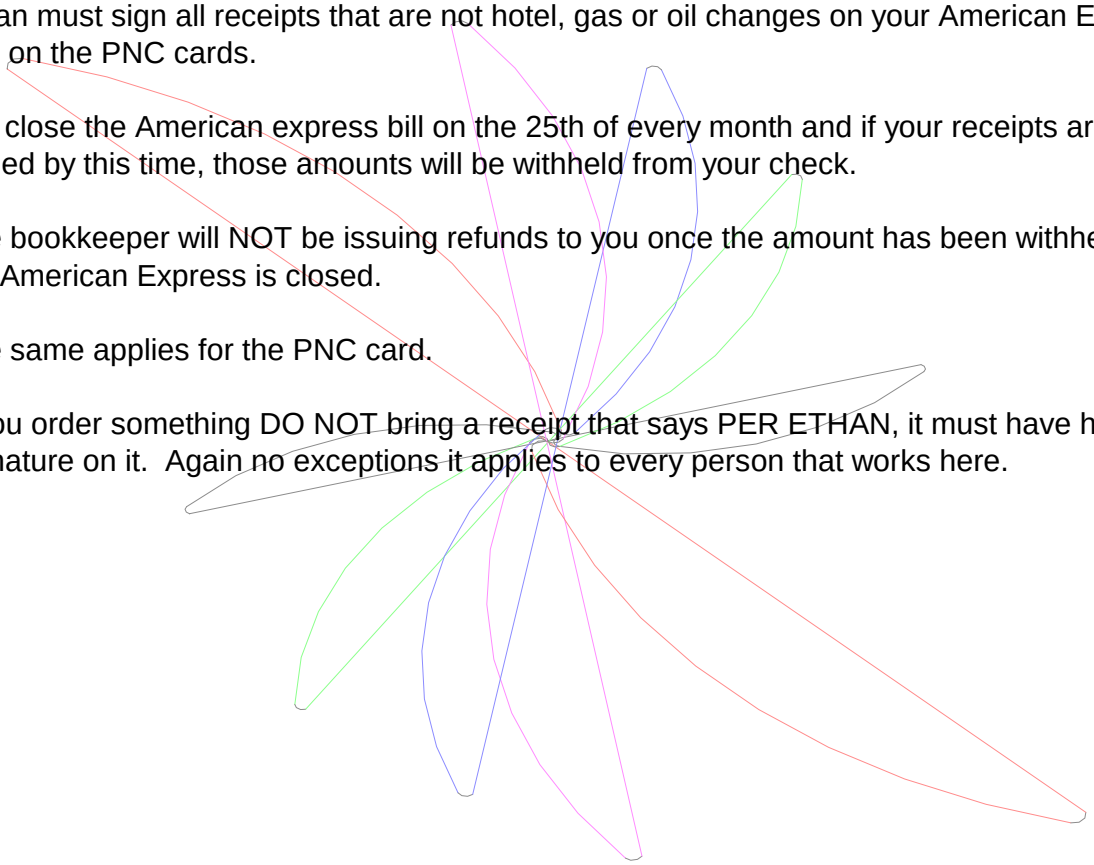
Ethan must sign all receipts that are not hotel, gas or oil changes on your American Express and on the PNC cards.

We close the American express bill on the 25th of every month and if your receipts are not turned by this time, those amounts will be withheld from your check.

The bookkeeper will NOT be issuing refunds to you once the amount has been withheld and the American Express is closed.

The same applies for the PNC card.

If you order something DO NOT bring a receipt that says PER ETHAN, it must have his signature on it.  Again no exceptions it applies to every person that works here.



# Company Vehicles

Please monitor your vehicles so we can fix early problems.

Look for uneven wear on tires. Loose steering. Burnt fluid smells. Dripping fluids. Squeals,squeaks,etc..

When traveling to/from jobs.

1) Travel as groups. Someone is there to help. You can transfer equipment to other vehicle and still make a job and/or keep thousands of dollars of the side in a stranded car.
2) Do not do travel over 12 hours.
3) Pack and prepare vehicles for long road trips. (eg. tie-down scopes, pack breakables and loose objects.)
4) Do a once over on your vehicle. (eg. check oil, tranny fluid, belts, tires, brakes)
5) Check on you lights. (headlights, turn signals)
6) In winter you should check on coolant quality. (Is it coolant or water which will freeze)
7) Carry plenty of windshield washer fluid. Buy some today.
8) Clean those battery terminals.

If you are following in a vehicle please allow 5 seconds from/between each vehicle.

FYI
Good Weather - During daylight with good, dry roads and low traffic volume, you can ensure you're a safe distance from the car ahead of you by following the "three-second rule." The distance changes at different speeds. To determine the right following distance, first select a fixed object on the road ahead such as a sign, tree or overpass. When the vehicle ahead of you passes the object, slowly count "one one thousand, two one thousand, three one thousand." If you reach the object before completing the count, you're following too closely. Making sure there are three seconds between you and the car ahead gives you time and distance to respond to problems in the lane ahead of you.
Inclement Weather, Heavy Traffic, or Night-Time Driving - In heavy traffic, at night, or when weather conditions are not ideal (eg. light rain, light fog, light snow), double the three second rule to six seconds, for added safety.
Poor Weather - If the weather conditions are very poor, eg. heavy rain, heavy fog, or heavy snow, start by tripling the three second rule to nine seconds to determine a safe following distance.
Tailgating - Following a vehicle too closely is called “tailgating.” Tailgating is an aggressive driving behavior that is easily mistaken for road rage. Use the three-second rule to avoid tailgating. Most rear end collisions are caused by the vehicle in back following too closely. If someone is tailgating you, move to another lane or turn off the road as soon as possible and allow the tailgating vehicle to pass.

The following are guidelines for the caravanning to/from jobs.

Not all jobs or circumstances are the same, however the general guidelines need to be adhered to when traveling with multiple vehicles down the road. You will travel in groups unless arrangements have been made beforehand.

1) When a job is complete and you are to travel down the road you are not simply turned loose. You are expected to travel in a formation of other vehicles. You are still on the clock until you get the vehicle to the shop.
>This covers a number of situations such as a vehicle breakdown - another vehicle is there for help, you can strand the vehicle and move people to a safe location. Move equipment and still get to job on time.

>A "phone in" job which equipment and personnel must go another direction might occur and we need to split resources. (you might have equipment)

>Accidents - we would hopefully see the accident and be able to respond with help, direct emergency vehicles, witness for police, etc..

2) You are to drive approved roads. - No detours to Vegas, girl friends, back roads, hunting roads.
We assume the major highways will always be utilized.

3) You are to obey the speed limit.

4) We will try to utilize familiar Hotels.

5) Use cell phones for contact with a hands free device only.

6) Do not follow to close - allow for space. Try to keep all spacing of vehicles even. On the highway you should be 1/2 to 1 mile in distance. In town you should close the gap.

The lead vehicle should set the pace and direction of the caravan.

As a member of the caravan your job is to keep track of the vehicle behind you. This is very important as it will assure that we all remain together if someone has difficulties. Emergencies in cold weather can become very dangerous very quickly.

Smaller vehicles should act as blockers for larger vehicles.

Hold a constant speed - if a vehicle is lost at a light they can catch up without the 100 mile an hour dash.

Vehicles are for company use only.

Obviously vehicles get split up in major cities, however if you are going the same speed you will usually meet soon after.

You will adhere to this guideline or disciplinary action up to and including termination are possible.

Using a Company Vehicle
As is company policy the personal use of company vehicle is prohibited. Friends and family members are prohibited at all times.

Please do not ask for use of a company vehicle.

If you use a company vehicle for personal use you will be required to report any accidents on your personal insurance and hold company harmless for all costs, fees, etc..

This additional rider must have liability coverage of $250,000 at a minimum and list vehicle as insured prior to the usage.

The associated costs to cover vehicle replacement, health concerns, lost wages, pain and suffering, potential lawsuits, etc.. even a small accident can move through the $250K limit on your policy and the company gets attached to the costs.

Maintenance and Housekeeping
We will maintain the upkeep of vehicles with regard to oil changes, tires, maintenance, cleaning.

Your job requires you to keep your company vehicles maintenance and cleanliness to a level acceptable to Ethan.

You can not simply wipe down the table and call it quits.

You need to remove all equipment, boxes, etc. from the vehicle and hose the floor, rugs, walls, etc.

You are expected to prepare your vehicle prior to a job (MOB) and clean, prepare, restock your vehicle after a job (DEMOB).

If you are not stationed a the shop you will perform this at your own home after getting home. This is part of your job.
Power Sources

If you are working on a job site make all attempts to operate your vehicle and internal equipment from power source at plant site.

The internal power is to be used where outside power in not available.

It is hard for us to properly recoup the $$ associated with the operation of a vehicle in the plant and the cost of the fuel.

From this point forward do not idle your vehicles.

If you need a supply of electricity, heat, or cool air make arrangements to get a heater or fan. Discuss with Ethan.

It is not only hard on the engines but also the price of a tank of gas every other day.

When the battery power to the A/C batteries needs topping off you may, but this would be a limited amount

Fueling Vehicles
We have had 2 Vans repaired at Stevenson Auto for the same problem, a fuel filling issue, the pump keeps shutting off as gas is put into the tank.
The expensive repair ($900) is to replace the vapor canister that sits above the gas tank. The canister's job is to absorb vapors during refueling and then release them back into the fuel system, to be burned off while driving.
The canister should last the life of the vehicle, but can be flooded ( which destroys the charcoal membrane in the canister), when the tank is topped off during refueling.
So please, no topping off. When the pump kicks off, hang up the nozzle and take your receipt.

Always return vehicles to the shop with a full tank.

Maintenance
From this point forward we will be performing vehicle maintenance on a rotation system.

This will be as follows:

1) Every other week a vehicle as directed from the rotation list will be pulled into the shop (west door) and the following tasks will be performed:

Review insurance card.
Review of oil change. Does it need one.
Review of mechanical issues - tires, brakes, window cracks, oil hinges, etc.
Review power supply system - battery, inverter.
Fully clean outside. Not the McDonalds wipe down. The Magnetec clean.
Fully clean inside.
Possible wax.
Re-stock missing items.

2) The Rotation list will be checked off and fully documented.
These should take a day or so and the vehicle returned the parking lot.

This does not supercede any cleaning, maintenance, restock that you may already have to perform if you used these vehicles.

The rotation list will reside near the phone table/AAH probe rack in large shop.

Vehicle Preparation
When you have a vehicle in your possession you need to check it.

You need to confirm the:

Insurance
Windows
Tires
Doors
Lights
Oil
Water
Inside
Outside
Does it start
Does it stop

Most very important - YOU MUST CALL AND ETHAN IN CASE OF ACCIDENT. YOU MUST TELL ETHAN OF MAJOR REPAIRS.

DO NOT MAKE A REPAIR OR HAVE A REPAIR PERFORMED UNLESS ETHAN KNOWS.

Please make copies of all of your latest vehicle maintenance sheets and bring them to the front office, this means your last oil change, any type of service such as brakes, tires or just general maintenance. If you are in Robinson please make copies and send them to the office.

Beginning today you must make a copy of all vehicle maintenance for the front office. You will keep the original in your rig and a copy must go to the bookkeeper. If you have charged these items. Do not forget to send an additional copy for your expense report or if its direct bill that you give a copy of the bill to the bookkeeper.

Housekeeping

All vehicles are to be kept in a clean condition. This includes all the time. You are expected to clean your vehicle after every job. You are expected to keep your vehicle in a ready to mob. condition.

Please wipe all surfaces down to the edges of each box and legs of your seat. If you have a vehicle out of town or you are store your vehicle at your home then perform this cleaning at that site when you return from a job.

Equipment must not be covered with 5 layers of a previous jobs dust.

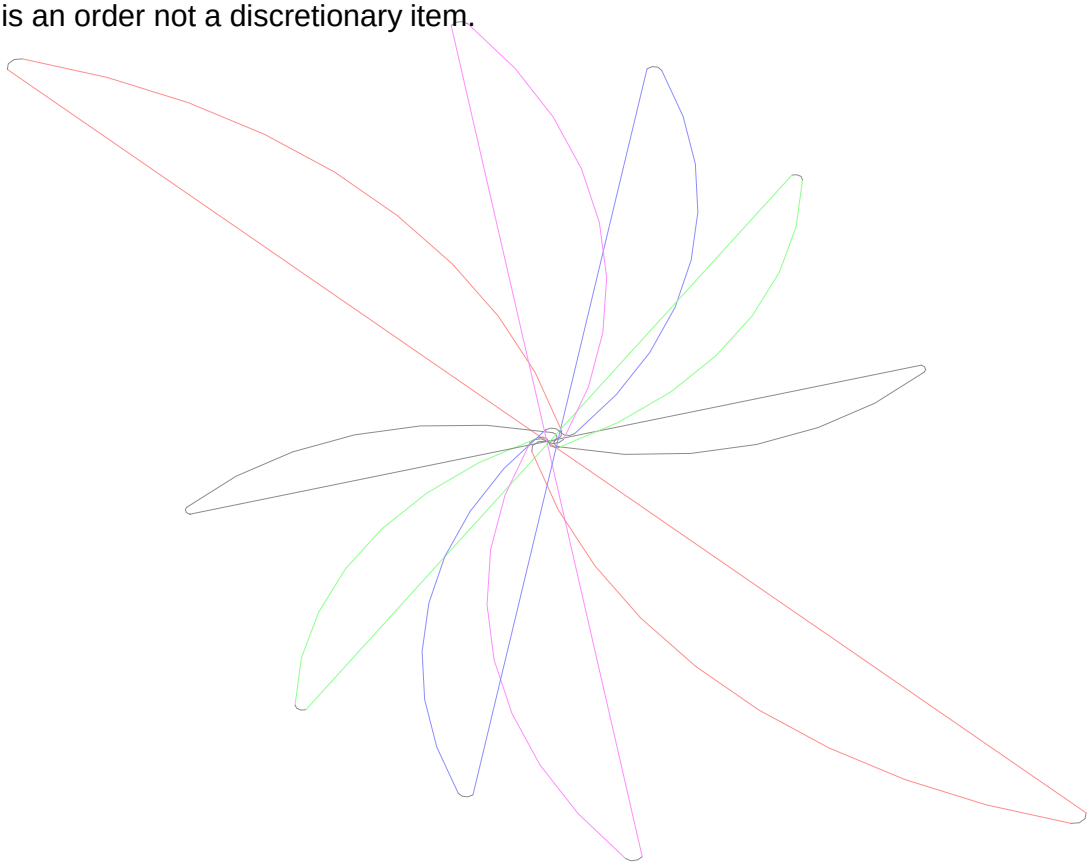
Batteries
If you have large utility/marine/farm batteries in your rig for power please check the water level in each of the 6 reservoirs.

Please make this check this week. Remember only distilled water. You should be checking these 2 times a year.

A new battery of 7/13 which was found with 5 of 6 cells dry. Power seemed to be getting worse and when checked were totally dry. There was no spillage and no evidence of leakage was evident underneath but the were dry as the desert.

This means that yours may be in poor shape also.

This is an order not a discretionary item.



# Vehicle Standards

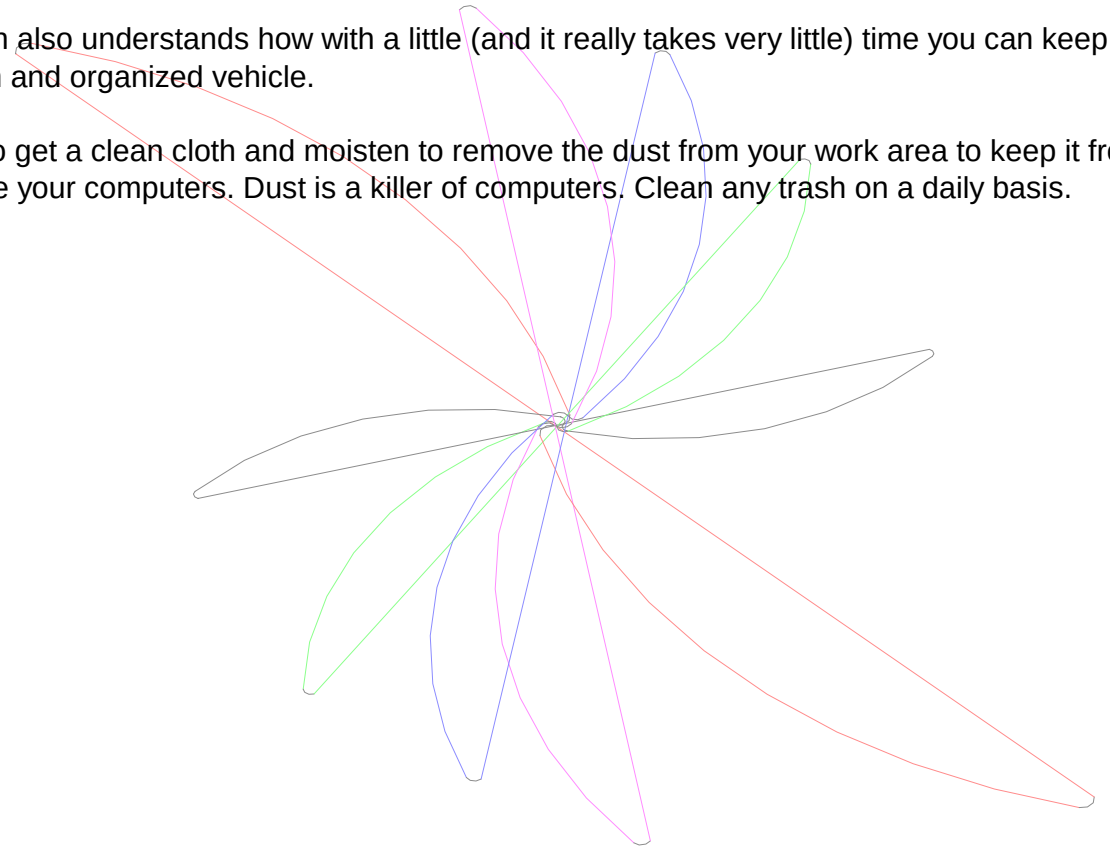
When on a job site there is plenty of time to keep your vehicle organized. A quick review on the last job found a few very clean, neat and tidy while a few were in utter dismay.

There is plenty of time on a job to take 5 minutes before and after shift to gather up loose items, clean/sweep the floor, and clean the work desk.

Since Ethan has worked here for a long time he fully understands how a vehicle can explode with stuff.

Ethan also understands how with a little (and it really takes very little) time you can keep a clean and organized vehicle.

Try to get a clean cloth and moisten to remove the dust from your work area to keep it from inside your computers. Dust is a killer of computers. Clean any trash on a daily basis.



# Vehicle Inspections

On Mon. morning as you enter the shop please check the inspection log found by the phone desk on the north shop. If you are the only person in the shop that week you need to perform these tests.

The specific vehicle listed on the log can be interchanged with other vehicles if the listed vehicle is on the road.

As you get back to the shop from the road with a vehicle you need to perform an inspection and write this into the specific calendar section on the log.

All problems found, discrepancies, repairs required need to be emailed to me. Do not perform any repair without notice to Ethan. This does not include scheduled maintenance such as oil changes, tire rotations, state inspections, etc.

If you notice a problem with the listed VIN number against the insurance or registration paperwork you need to add Jennifer to the email you would send to Ethan.

Phil and Adam will complete an inspection log once every month on the first trip of the month.

The above listed inspections do not preclude the inspection you need to do prior to leaving on a road trip.

A safety inspection should cover the following things:
1. Check the fluids. This includes oil, power steering fluid, transmission fluid, antifreeze, windshield washer fluid and brake fluid. If you have not changed your oil in the last 3,000 miles, change it now.
2. Top off any fluids that are low.
3. Do your wipers give you a smear-free view when it rains? If not, replace them before your trip.
4. Make sure your car's battery and cables are securely attached and free of corrosion. Car batteries typically last three to five years.
5. Check the brakes.
6. Make sure all shocks, struts and springs are in good working order.
7. Check to make sure all lights are working. This includes brakes, turn signals, headlights and taillights. If you are driving a truck with running lights, make sure all running lights are working.
8. Check the tires. If the tires are showing any tread wear, replace the tires. If the tires have uneven tread wear, check the alignment too. Make sure all four tires and the spare are inflated to proper tire pressure.
9. Make sure the service engine soon light and any other “lights” in the dash are not lit. If they are lit, fix the problem before you leave (even if the car seems to be running properly)!

We have a vehicle inspection log near the phone in the back (north shop area).

If you do not know where this is you need to find it and review the contents.

A vehicle will be inspected every Monday (at least one per the scheduled week)

The log has the vehicle number which needs to be inspected. This will of course mean all of the other requirements (inspection, cleaning, checking documents, re-stock etc..)

This is in addition to what you will be doing on any vehicle you use on a daily or job basis.

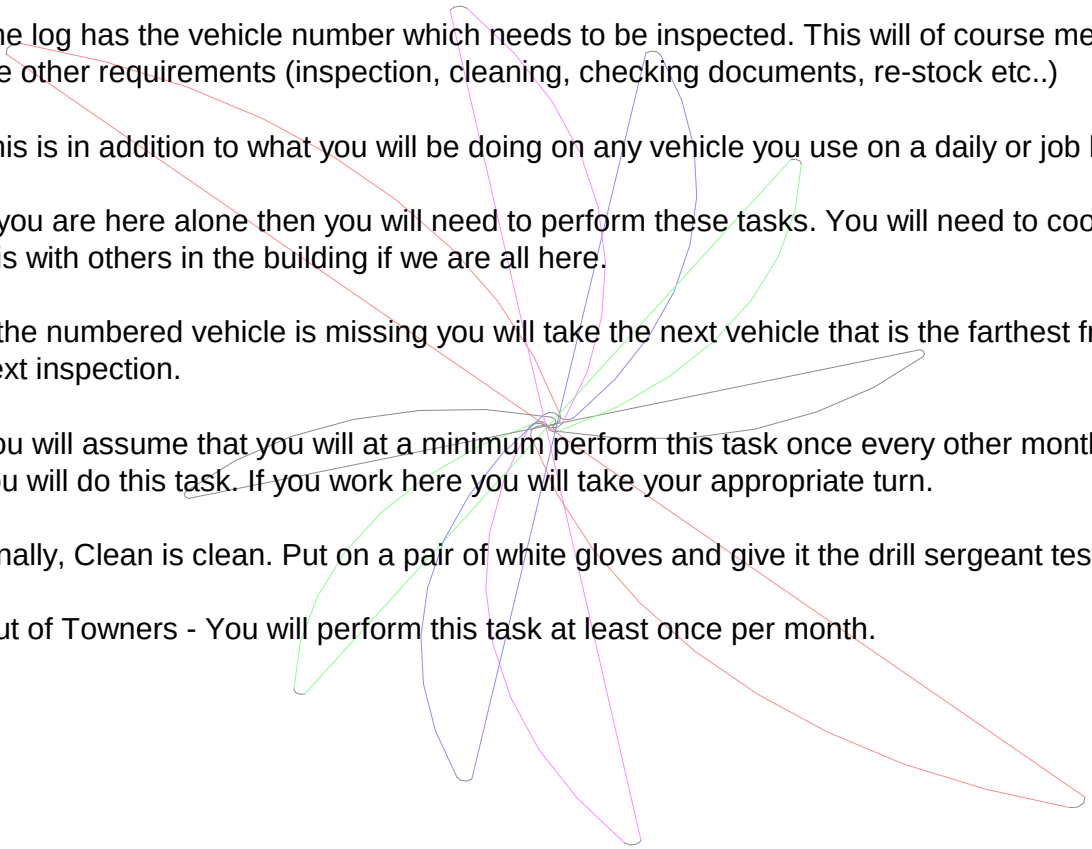
If you are here alone then you will need to perform these tasks. You will need to coordinate this with others in the building if we are all here.

If the numbered vehicle is missing you will take the next vehicle that is the farthest from the next inspection.

You will assume that you will at a minimum perform this task once every other month. That is you will do this task. If you work here you will take your appropriate turn.

Finally, Clean is clean. Put on a pair of white gloves and give it the drill sergeant test.

Out of Towners - You will perform this task at least once per month.



# Vehicle Repairs

We continually have vehicles with repairs being required.

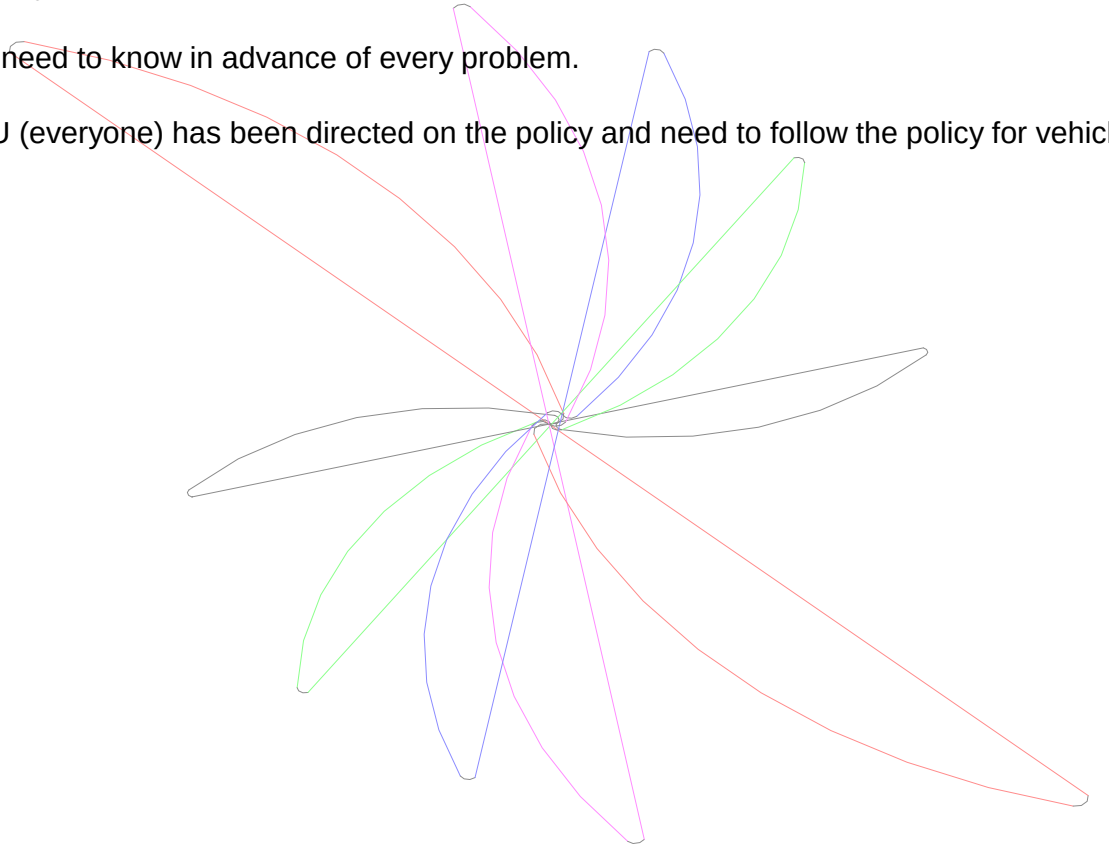
Ethan needs to know of a problem in advance of a diagnostic.

Ethan should know well in advance of a problem.

When you drive a company vehicle you need to be constantly vigilant to every noise, squeak, shimmy, etc..

We need to know in advance of every problem.

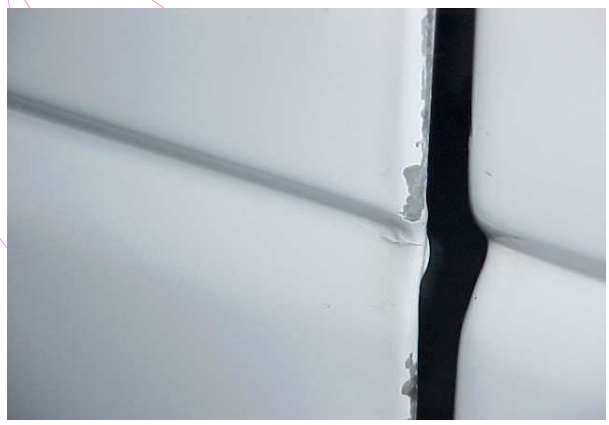
YOU (everyone) has been directed on the policy and need to follow the policy for vehicles.



# Common Vehicle Door Issue

Company Vehicle Door issue
Recently we have had several broken doors. The doors are failing swinging them open and letting them bounce against there hinges and or letting the wind sling it open at a high rate of speed. This causes the outer door skin to break the glue joints that hold it to the inner door. Please reference photos.

In the photos above you can see the silver area where the outer door skin separated from the inner door skin. This is held by glue which is very strong however letting the door hit the stops and bounce enough times it will eventually fail. The door can not be shut at this point without severely bending the front fender and outer door skin due to the misalignment.

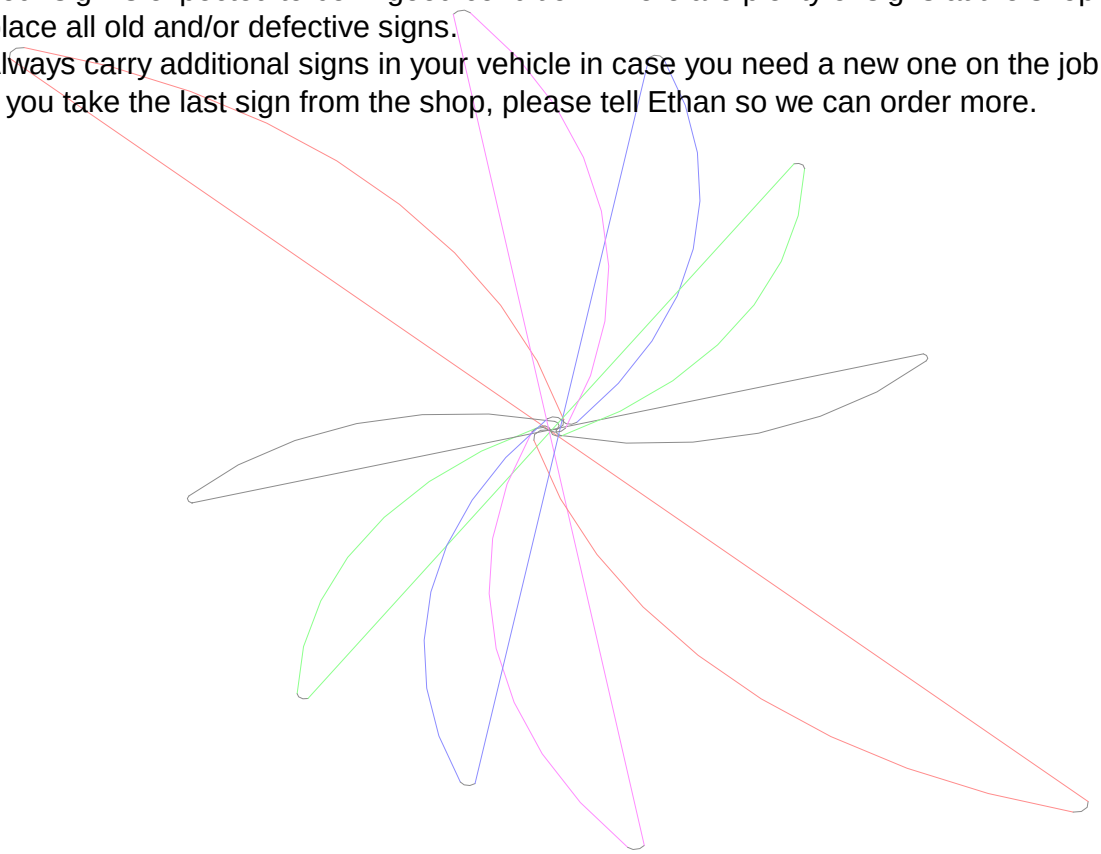


The above photo on left is a correct glued joint. The photo on right is what the door and fender will look like when you get it shut (if your lucky). The bottom line is repair costs are high for this issue. If you open your door slowly and don't let it hit the stops and bounce then you will never ever! have this problem. This issue is easily avoided. If your passenger or driver is slinging the company vehicle doors open or letting the wind take it then correct them.

# Vehicle Signs

.

1) When on plant sites you will display your door sign.
2) The sign will be positioned correctly on the door. Level, centered, right side up.
3) The sign will not be thrown onto the door as you enter the gate. GET OUT AND PLACE THE SIGN.
4) The sign will be removed when leaving the plant every day. Do not drive down the road with a sign attached.
5) Your sign is expected to be in good condition. There are plenty of signs at the shop. Replace all old and/or defective signs.
6) Always carry additional signs in your vehicle in case you need a new one on the job site.
7) If you take the last sign from the shop, please tell Ethan so we can order more.



# Equipment

When you pack for a job and/or unpack your equipment or vehicle please review any probes, cal-tubes, connectors, data takers, computers, tooling, sleeving equipment that should be returned to the shop and/or specific location. Do not leave any of the above mentioned articles in areas that are regularly used for this storage. Do not leave probes at home. There are many trips leaving the shop at any one time and we do not need to be searching for items that were not returned.

We all need to be aware of the equipment we have for a job and be able to account for it's location at all times. All equipment needs to be returned, repaired, and accounted for at the end of a specific job. Do not return broke, non-functioning equipment, tools, probes, etc. to the work force without either fixing and/or passing the information on.

You should test all equipment leaving for a job. You should review all inter-connectors to insure that all that are needed have been packed and those not required are returned to the equipment storage. Almost all of the equipment we own has specific connectors, boxes, etc. that are packed with the equipment and need to be returned to the correct location after use.

The last thing we want to do is have a crew on the road with broke, missing, inoperable equipment.

Our equipment is our profit margin. Take care of our equipment as if you owned it. Our bottom line depends on this.

Please review all equipment prior to mobilizing for a job to confirm that it works, you have all necessary material, you are actually bringing a scope to the job, etc..

Defective Equipment

1) The reason you are determining the probe is "bad" (i.e. "coil shorted to body", "red-wire shorted, etc

Other examples - Snaked cable, Cut cable, noise in probe, potting, etc.

Give a good description of problem so we know where to look at shop.

2) The date that you are taking it out of service.

3) Your initials -

All probes should be checked with Ohm meter prior to returning to shop if it a circuit problem. Mechanical problems are just returned (eg. Loose probe, bad cable, cut cable, etc..)
We have some small labels with strings in every probe box for the tagging. You should pick some of these up for the purpose of tagging probes.

Please inform your corresponding tech's of the request.

***Equipment Continued:***

If and when you have equipment to be repaired you will need to send Ethan a formal email with problems, instructions, etc.

Do not just hand to another employee and say these need fixed. What we tend to get is a pile at the shop of some undescribed items, with no know information.

Do not, and never assume that the employee you gave your equipment to will properly handle it for repair. More than likely, the equipment will sit in a pile somewhere until you are either in dire need or the question is asked "what is this".

Never, write a miserable post it and stick it to a repair item. They do make wind here in Illinois and the stickem will probably not hold. So again there it is, a pile - a pile of broken stuff mounded in the corner. No notes attached, no directions, no diagnosis - just a pile.

So - You will always send a formal repair request to me for an item.

That way Ethan can:

Know to look for items
Know who to ask
Know the problem
Know who the stuff is
Know timing on repair
Know if backup is needed to be sent

Turning in Equipment
There appears to be a large amount of probes, cal-tubes, etc. mat'l that has made it to vehicles and are not being returned to shop.

For this E-mail the RFET probes for tubes above 1" are out.

DO NOT SIMPLY CARRY A BUNCH OF EQUIPMENT AND NOT RETURN IT TO THE SHOP.

If you are shipped probes, cal-tubes or other equipment it is your responsibility to get it back to the shop when done with it ASAP.

YOU MAY ONLY CARRY THE EQUIPMENT YOU HAVE BEEN DIRECTLY ISSUED.

Guidelines for probes entering and exiting building.
Probes leaving building:

1) All probes will be checked for continuity/resistance, short to body.. This would at a minimum level prove the probe is valid.

2) All probes will be taped in our standard manner. This may mean you will have to re-tape the probes.

3) All probes will be in good order. (Taped correctly, tape balls removed, clean, four corner - taped areas correctly taped, red wire ends to clean wire)

4) Probes should be accompanied by label pack to mark/label/identify problem probes. These should be utilized to mark bad/shorted/open probes.

Probes entering building:
1) Probes need to be positioned in the "IN BOX" for review or directly reviewed prior to being inserted in working/storage bins.

2) Probes from the "IN BOX" will be reviewed with the following aspects being checked. Cleanliness, shorts, opens, body shorts, taping, worn components, worn cables, frayed red wire.

3) A marked "bad" probe should be setup on a scope and reviewed prior to disassembly. A verified "bad" probe after setup on a scope and diagnostics should have the head cut off and if not immediately re-worked be taped to the cable. The probe serial number/info label should be entered into the active probe database.

4) Once a probe is verified as "good" and is taped, clean, etc. should be entered back into specific bin for storage.

Do not leave probes in areas of shop not directly involved with the probe process. Probes should be reviewed very shortly after return to shop so issues can be resolved and probes returned for re-commission.

Do not simply return a probe to the working bins without a complete verification process.

Special probes need to be returned to MIIIL at end of job cycle.

Probes in your specific vehicles need to be reviewed on a regular cycle. Do not stock pile "bad" probes.

All vehicles should have a working OHM meter to prove up probes.

Equipment Check Out

All our equipment is to be accounted for prior to leaving the building. There is actually a master equipment list in Ethan's possession which has just about everything recorded. Any item must be accounted for prior to leaving the building or packed up for a job.

You can not issue to another employee a piece of equipment. It must at least be document and given to myself to be entered on the master inventory list. A request should be made and when approved the item fully inventoried.

We purchase extra, replacement part for equipment to have on hand so it is on the shelf if it needs replacement immediately. This does not mean to go ahead just grab what you need.

Essentially, Ethan wants to know about everything entering and leaving the shop.

This also allows for the item to be correctly shelved so we know where to look.

In all cases, all times, every occurrence, any required that you take a scope, computer, tablet, archos, battery charger, battery, head phone, camera thee must be an associated e-mail to Ethan.

You can assume that you will send Ethan an E-mail for any stock item removed from the shop.

Scopes

To keep things organized there is a new procedure for scopes that need some TLC. In the Clean Room (Farthest room from DC offices) you will find a table with Repair Gurneys (Reference Pic) as well as a Scope Repair Document (Reference Pic) to accompany your scope. Please fill out the document and place it in the gurney with your scope, then place the aforementioned on the same table with the rest of the scopes.

There are now 3 RFET loaner scopes prepared for issue. (L5, L6, L7)

As usual the scopes must be logged out and in.

In addition, The scopes should be checked prior to taking and being logged in to confirm that you have an operating scope. Operation check when logging in will insure that any repairs can be made prior to the scope being re-issued to the next person with problems.

JUNK IN/ JUNK OUT.

The loaner book now has additional sections for the logging out/i other equipment such as D-meters, UT scopes, video probes, Miz-27's, etc..

Assume that when you remove equipment you will log it out.

As an employee of this company you are required to have all your issued equipment in good working order, cleaned and prepared for inspection, reporting, etc...

It is on a continual basis that equipment is reported to me that does not work , has not worked,  or is not working for weeks, months.

YOU MUST INFORM ETHAN IMMEDIATELY THAT EQUIPMENT IS NOT WORKING. YOU MUST INFORM ETHAN ON A CONTINUAL BASIS OF EQUIPMENT NOT WORKING.

This would include all scopes, computers, etc..

TAGGING
From this point forward we will be using Repair tags on any piece of equipment that is returned to shop that does not work as intended and needs review/repair.

This would include your personal equipment from your vehicles.

The tags can be found in the top drawer of the large snap-on toolbox where the plastic zip lock bags are found.

THE TAG MUST BE FULLY FILLED OUT - another person should be able to derive the problem noted in the equipment by reading the tag.

In addition, if there is some intervention that you can not perform, or you do not have the training, or we are waiting on a part, etc.. you must send me an email with the path forward on this.

Equipment that is part of an on-going project, is R&D, is not a repair item does not need to be tagged.

If you are forwarded equipment from Phil, Adam you must place the tag and send email. So, a pair of dead headphones can not simply be put in a pile.
Do not place equipment around the shop and walk away from it. If there is a long term repair you must sequester the equipment, parts, etc.. to a side desk until the repair can be completed.

Wrapping Probes
Wrap probes so that the probe head is orientated on the inside of the cable loop. Tape the head to the cable so that it is protected, and will not get snagged on other probes in the bin.

Be sure to have the information label on the outside of the cable loop so that it is easily read when placed in a bin. Do not tape over any of the text.

If an information label is missing: Create a new label with all of the information available, and affix it to the cable.

Specialty Probes
We have a small number of specialty probes for now that need to go into the Special probe box. Some do not or have not known which probes or then to keep them separated. They and those of the future will have a YELLOW label at the rear. So they need to find there home in that box. Please let's keep that in check.

# Equipment Calibration

As is described in the ASME codes, ASME specifications, CP-189, and internal procedures the equipment utilized for an inspection needs to be calibrated once a year.

Attached below is a brief description of that requirement. In general, you can assume your equipment has been calibrated when it left the shop as part of the manufacture process. In fact it has to be calibrated for it to even work as the frequency/gain setting has to be brought into tolerance for the circuitry to even work.

We have initiated a internal program for calibration of equipment which is traceable to NIST and ISO-2010
(National Institute of Standards and Technology).
This was firmed up by sending out a specific oscilloscope to a national testing lab for calibration and using that scope to calibrate other oscilloscopes and/or for calibration of our scopes. This means that there is a known documented, traceable test equipment standard back to government or national/international equipment. The equipment was calibrated to international/national standards utilizing precision crystal oscillators locked to other international oscillators across the world. In addition the gain was calibrated to similar sources.

There essentially has to be a chain of custody for the documentation of calibration to a piece of equipment. With this in place we are fully compliant with all known standards across the world and encompassed within all know codes and standards.

You will be asked to deliver your equipment and/or we will calibrate the scopes at work sites over the next months for the calibration process.

Please note that a scope running at say 74200 cycles per second (74.2KHZ) when it should be at 75000 cycles per second does not minimize any detection limit, sensitivity, or really impact phase spread.

We can calibrate our equipment and/or competitors equipment with the same process. Again the requirement is traceability.

If you have specific questions, please feel free to ask.

VIII-861 Equipment Calibration

VIII-861.1 Analog Equipment. The following shall be verified by annual calibration:

(a) The oscillator output frequency to the drive coil shall be within 5% of its indicated frequency.

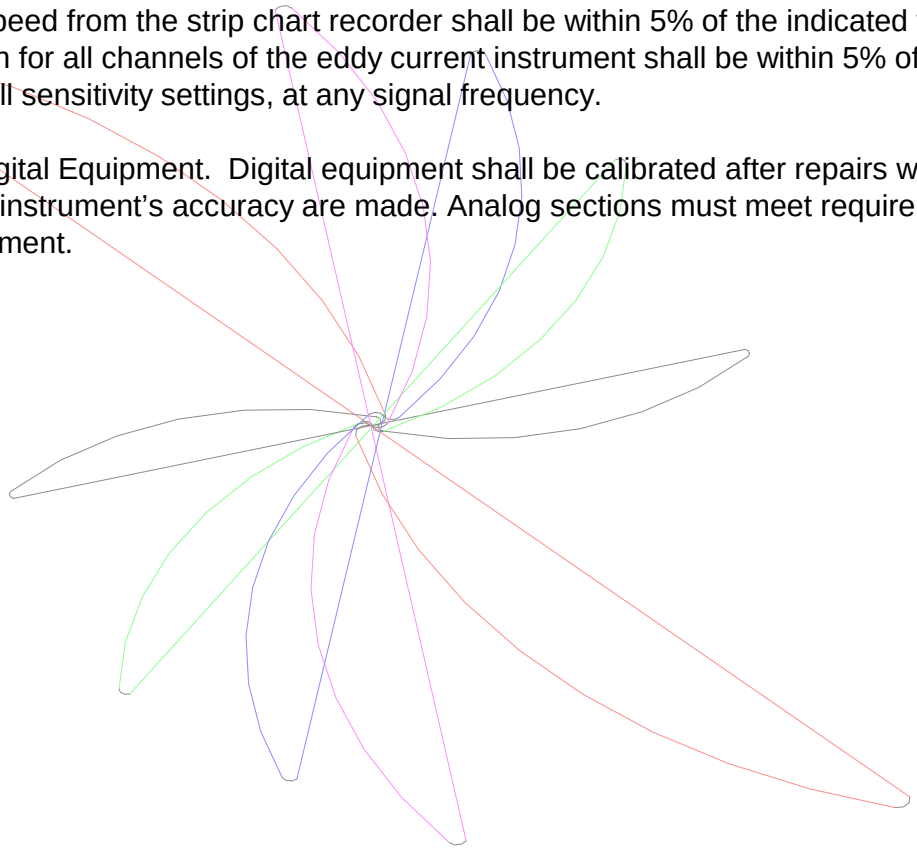
(b) The vertical and horizontal linearity of the cathode ray tube (CRT) display shall be within 10% of the deflection of the input voltage.

(c) The ratio of the output voltage from the tape recorder shall be within 5% of the input voltage for each channel of the tape recorder.

(d) The chart speed from the strip chart recorder shall be within 5% of the indicated value.

(e) Amplification for all channels of the eddy current instrument shall be within 5% of the mean value, at all sensitivity settings, at any signal frequency.

VIII-861.2 Digital Equipment. Digital equipment shall be calibrated after repairs which may change the instrument's accuracy are made. Analog sections must meet requirements for analog Equipment.



# Harness Inspection Program

Magnetec Inspection has a harness inspection program.

There will be two components to the program.

1) Harness inspection forms.
2) Harness inspection tags.

As we know you need to inspect your harness prior to every usage.

Please follow the link for inspection items.
http://www.osha.gov/Region7/fallprotection/fall_protection_info.html

Additionally you will need to perform a quarterly inspection of your harness that will be more complete and will require a harness inspection form to be filled out. Once completed the form will be mailed along with the next expense report for filing at the north office. A red quarterly inspection tag will be placed on the Right shoulder strap (Jan, Apr, July, Oct) until the next quarter.

We do not expect you to be a harness engineer and/or a manufacture QA/QC department only review your harness looking for the items listed on the inspection form.

If you need additional inspection forms and or tags please forward E-mail. we will be working on getting all personnel these items, however they may be distributed as a transfer point is reached.

You will need to complete one inspection form for each harness in your control on a quarterly basis.

You will need to send this form in to Michelle for filing. You may send it with your other report packages and/or expense reports.

For our outside inspectors we will be sending the information, documents and quarterly tags.

Please have your first quarter inspection forms in by Jan 31 of each year.

# Scanners

We have a pile of small portable scanners for the field reporting process.

In this way you can take a scanner with you and scan your field copies at the end of the day and send to shop for completion of the final.

You would create all files and directory structure (Project directory) with the normal files (Reference below) and send as a complete e-mail.

Project directory files:
XXX_Photos
XXX.csv
XXX.ts
XXX.jpg
XXX_field/final
XXX_Client info. (drawings, U-1, Past history, etc...)

So, You go to VRCTX and perform a test. After completion of the inspection you would scan the field copy.

Report names:
Field copy = That's the 2 page thing you write your verbiage on.
Final = Report you give client within 24 hours of inspection.
Field report  = Same as the final
Supplemental = Report sent from shop after completion of final (usually a couple of weeks)

You would then compile the project directory with files listed above and send. You would be directed as to who to send them to. You would use the proper file formats. You would use your proper email address. You would always copy Ethan in. You would have communication with the email recipient to confirm they got the package.

The scanners are to be checked out in the same way as the loaner scopes. (look for Tab in log book).

You will need to try one of these at the shop, load the software, do some scans, etc..PRACTICE!

# Portable DS Scanners

Instructions for Portable DS Mobile Scanner

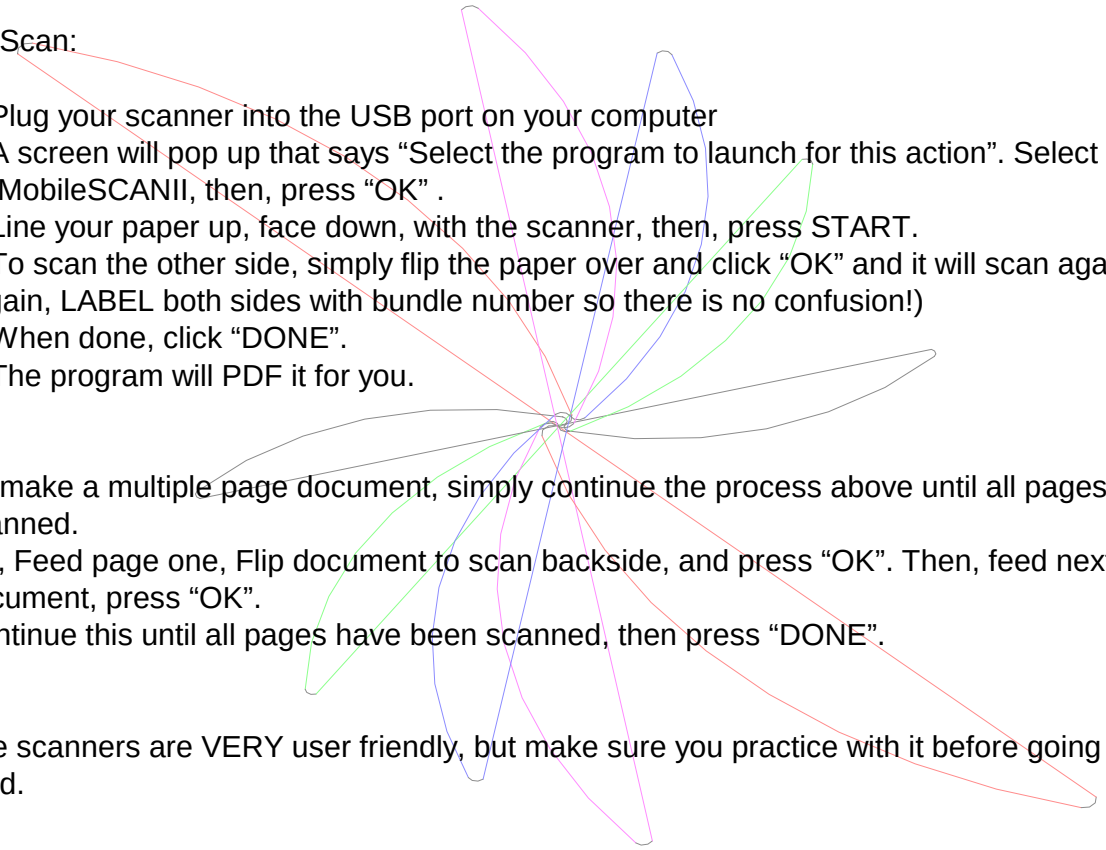
1. Please use installation disc and install scanner driver

2. You will have to calibrate the scanner with the calibration paper given with the installation CD

3. Prior to scanning, please label ALL sides of your field hard copy with the bundle number

To Scan:

1. Plug your scanner into the USB port on your computer
2. A screen will pop up that says “Select the program to launch for this action”. Select DSMobileSCANII, then, press “OK” .
3. Line your paper up, face down, with the scanner, then, press START.
4. To scan the other side, simply flip the paper over and click “OK” and it will scan again. (Again, LABEL both sides with bundle number so there is no confusion!)
5. When done, click “DONE”.
6. The program will PDF it for you.



To make a multiple page document, simply continue the process above until all pages are scanned.
I.e., Feed page one, Flip document to scan backside, and press “OK”. Then, feed next document, press “OK”.
Continue this until all pages have been scanned, then press “DONE”.

The scanners are VERY user friendly, but make sure you practice with it before going on the road.

# Probe Tracking Form

The following pertains to the Probe Tracking Form spreadsheet on the computer in the probe winding room at the main shop, and everyone entering data there.

When a probe is decommissioned, it should be noted in the main Probe Tracking Form electronic file. This has been getting done incorrectly, or sometimes, not done at all.

The correct way to do this is to:

1. Hi-light all of the cells that pertain to that probe with the fill-color of yellow.

2. Enter the current date in the cell for the "DATE OF INACTIVE" field. -This will calculate your "DAYS AS ACTIVE" field.

3. Enter the reason why the probe failed in the comments section of the "PROBE DESCRIPTION" field (there is already a comment template in this field). -Do not enter this info in the "DAYS AS ACTIVE" field.

4. Be sure to save your changes.

5. Be sure to also save to back-up on memory stick that is there.

If you are not sure, what you are doing, just ask somebody to help.

As you all know we have a tracking system for every job where a probe (s) and cal-tube (s) are tracked via a bar code system as they leave the door.

An "Equipment Tracking Report" is to be printed for each job. In fact, there are 2 that are to be printed as follows:

1) This copy goes with the job and is used as a reference on a job or as a job inventory list.

2) This copy goes into the little black box next to the logout/log in computer which is located between that racks of probes. This list should be put in order with the preceding lists so a permanent log of equipment leaving the building and returning is available.

When ever you check out probes or cal tubes they should be checked out to the job #, acronym, and a PERSON.
Example:
098-14 MPIL Leigh.

Whenever you leave the shop with probes and/or cal tubes they SHOULD BE CHECKED OUT! properly to the job.

Don't just grab an item and leave without properly checking it out!

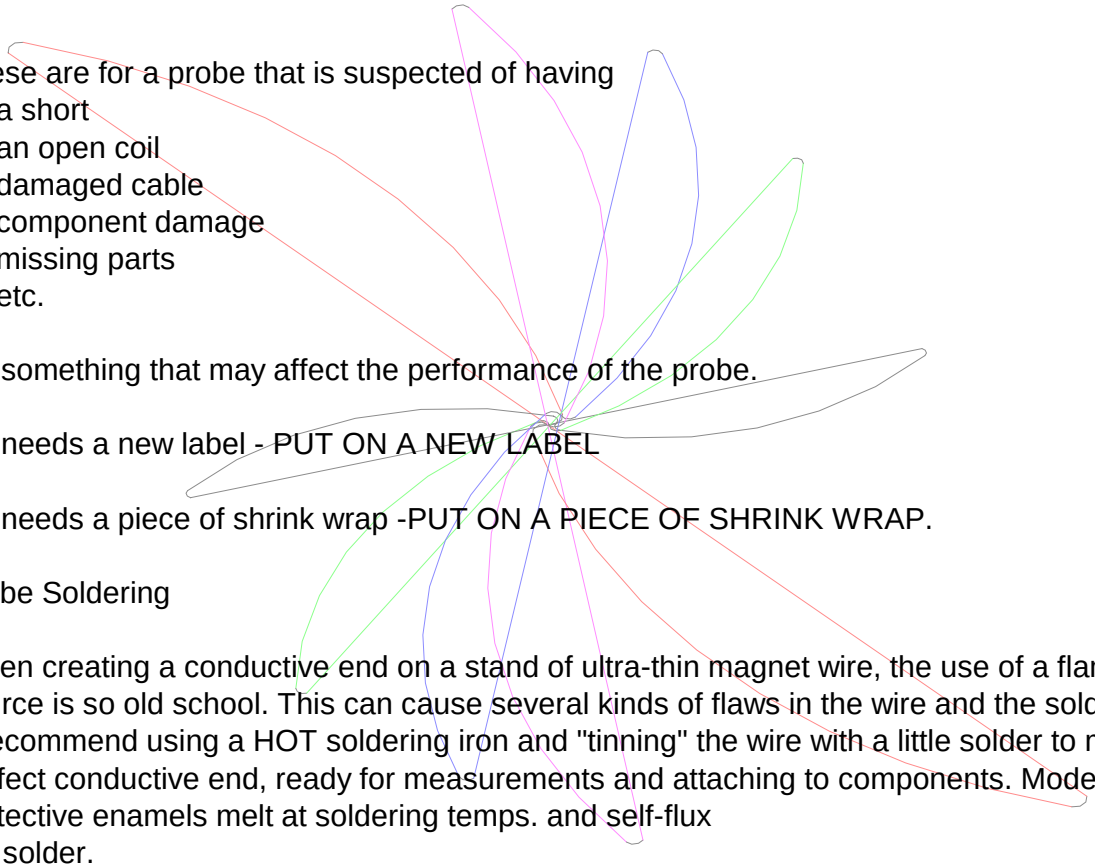
If you have to you can always go on to MxDataClient via any computer on-line and do all this. You don't have to be exclusively at the back shop scanner (inventory) computer to do this.

And if you are in a situation where you find yourself in possession of items from multiple job #'s then go on line and consolidate them to one job#.

You could check probes in from one job and then back out onto the consolidated new job listing.

And you then will always be responsible to get a copy into the little black file box next to the scanner (inventory) computer.

In regards to decommissioned probe tags:



These are for a probe that is suspected of having
- -a short
- -an open coil
- -damaged cable
- -component damage
- -missing parts
- -etc.

i.e. something that may affect the performance of the probe.

If it needs a new label - PUT ON A NEW LABEL

If it needs a piece of shrink wrap -PUT ON A PIECE OF SHRINK WRAP.

Probe Soldering

When creating a conductive end on a stand of ultra-thin magnet wire, the use of a flame source is so old school. This can cause several kinds of flaws in the wire and the solder joint. I recommend using a HOT soldering iron and "tinning" the wire with a little solder to make a perfect conductive end, ready for measurements and attaching to components. Modern protective enamels melt at soldering temps. and self-flux
the solder.
Originally posted by lineup
From wikipedia:
For ease of manufacturing inductive components like transformers and inductors, most new enameled wire has enamel that acts as a flux when burnt during soldering. This means that the electrical connections at the ends can be made without stripping off the insulation first. Older enameled copper wire is normally not like this, and requires sandpapering or scraping to remove the insulation before soldering.

# Probe Sizing

Inspectors need the correct probe size to inspect a specific tube size.

The better the fit the better the test. A correctly sized probe will allow for better magnetic coupling of the probe coils to the tube material which allows for a more sensitive test, lower probe drives, lower pre and post amplification, better signal to noise ratio, etc..

Here is how to make a good selection.

Take the O.D. of the tube and remove 2 times the wall thickness - You now have the I.D.

Take the I.D. measurement and remove .075 - This will give .0375 a side for clearance. This would be a great fitting probe. Assume .050 clearance a side for a total of .100 for most probes used in the real world.

If you are at the shop, find a cal-tube of similar size and fit the probe to the tube. You should have from between .0375 to .05 clearance a side.

When you pack for another person they rely on your ability to determine the correct probe. Make your selection correctly.

Example:

Tube O.D. = 1.0
Wall thickness = .083
I.D. then is = .834 (1" - (2 X .083))
.0375 Clearance = .759 (.834 - (2 X .0375))
.050 clearance = .734 (.834 - (2 X .050)) - This is about right for a real world probe.

Assuming the ASME code for detection of an .052 hole in a .750 dia. tube.

Lets do some math.

lets call the drill hole a .050 to keep it simple.

If we would drill .050 holes from edge of hole to edge of hole we could get 20 of these in one inch.

If we carried this further we would get 240 in one foot.

If we carry on we get 2400 in a 10' foot section of tube length.

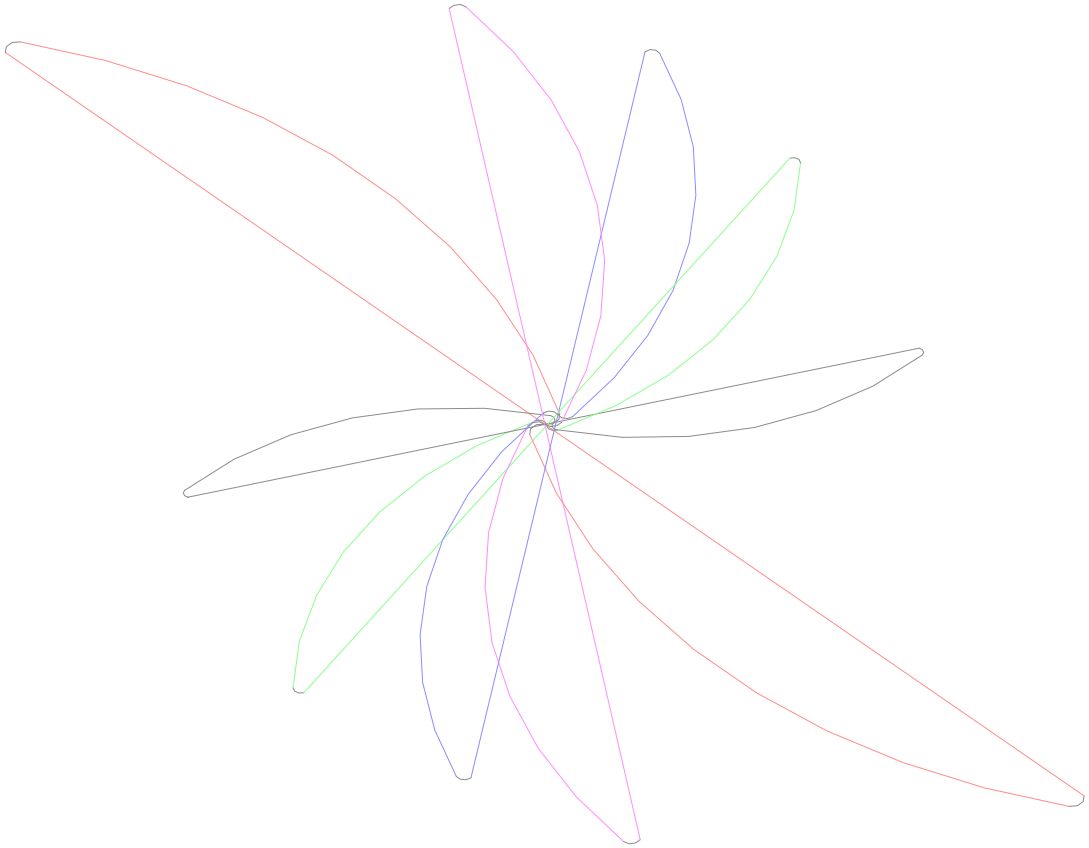
We would yield 4800 in a 20 foot tube length (This would be our average tube length).

If we test 500 tubes we would have 2,400,000 possible areas where a .050 hole could be hiding.

If we test 1000 tubes we would have 4,800,000 possible areas where a .050 hole could be hiding.

This is nothing less than the needle in the hay stack.

We all know a pitted tube has multiple pit sites in any one linear plane of a tube section which would multiply these numbers by 5,7,10 fold.



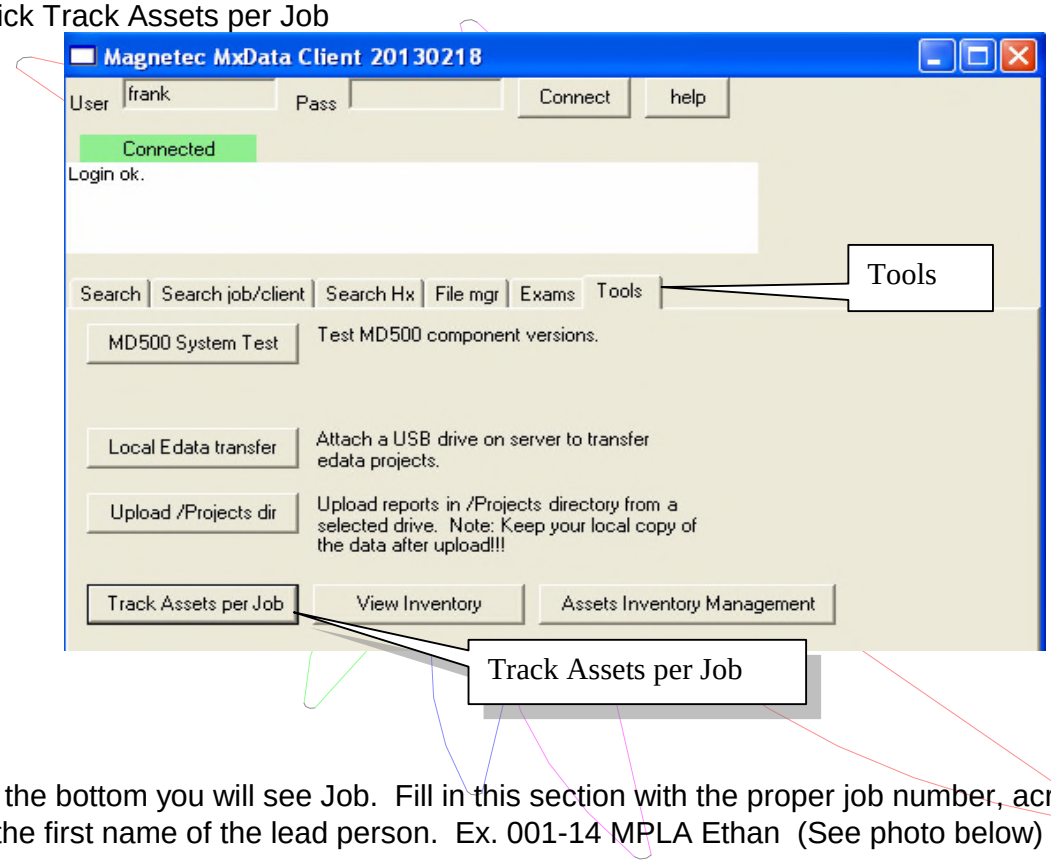
# Barcode Tracking Procedure

Prior to probe check out, you should have all of your probes and cal tubes pulled, placed in a proper bin, and the job number with acronym on a piece of paper typed in large, bold font to identify which probes they are.

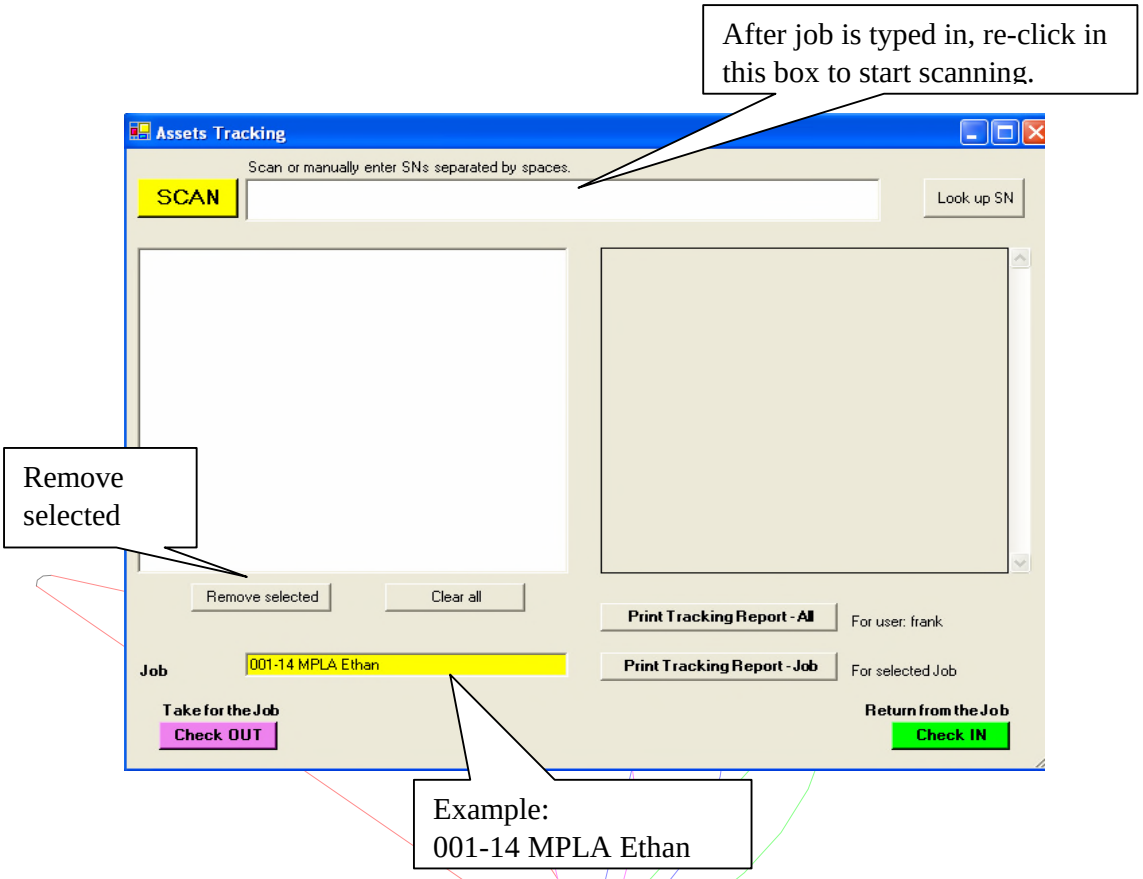
1. Log onto Mxdataclient

2. Click Tools

3. Click Track Assets per Job

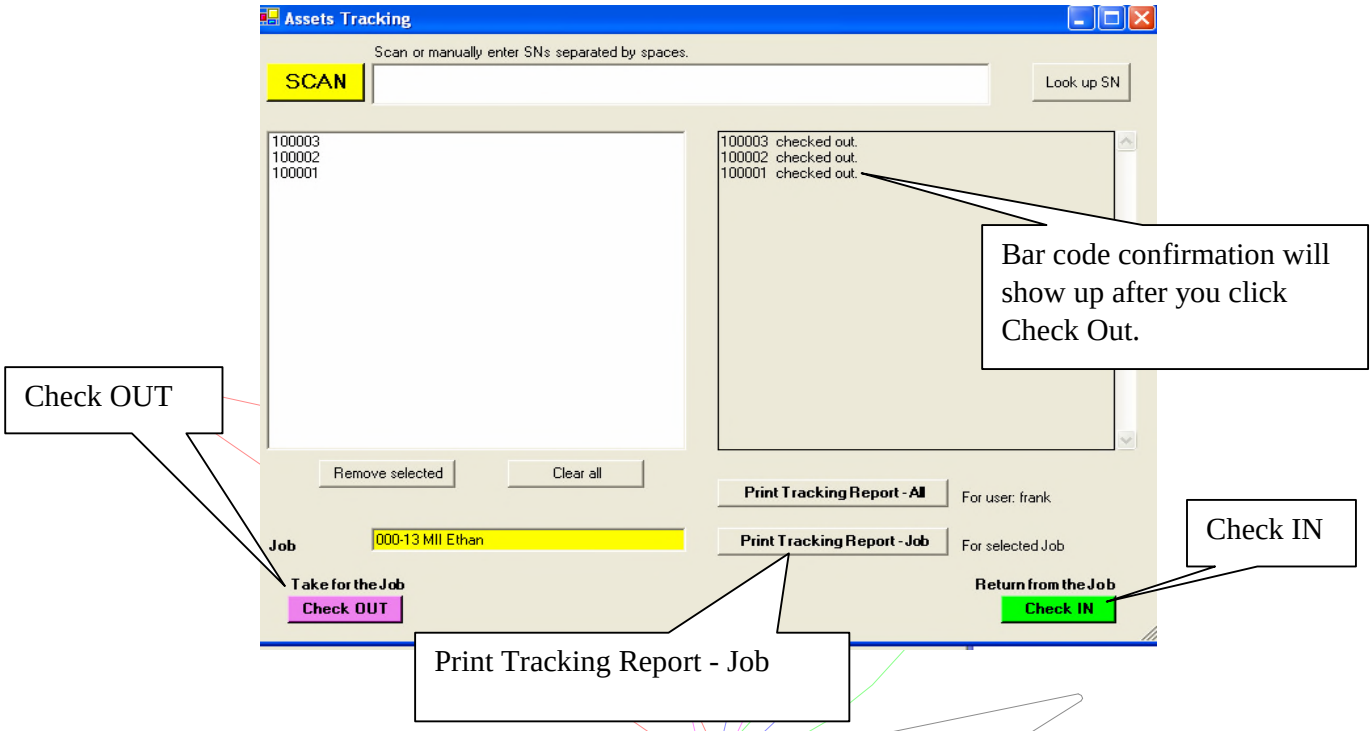



4. At the bottom you will see Job. Fill in this section with the proper job number, acronym, and the first name of the lead person. Ex. 001-14 MPLA Ethan (See photo below)




5. You will then have to click on the empty box of the scan section to allow the scanner to input barcodes. You can now scan each probe and cal tube. Warning: barcodes have been suspected to input wrong numbers, due to cleanliness of the barcode labels. As you scan each barcode, check to make sure each number is added correctly. If you don't have a scanner simply type in the 6 digit barcode number and push the space bar to enter each bar code in. Pushing the enter button will do nothing. If you entered in a wrong barcode, select that code and click the Remove selected.

6. Once everything has been scanned in, push the purple Check OUT button at the bottom left corner of your opened screen. You will then see all of your barcodes listed as checked out to confirm that they had been checked out for the specific job on the previous empty box on the right side of the open screen. (See photo Below)

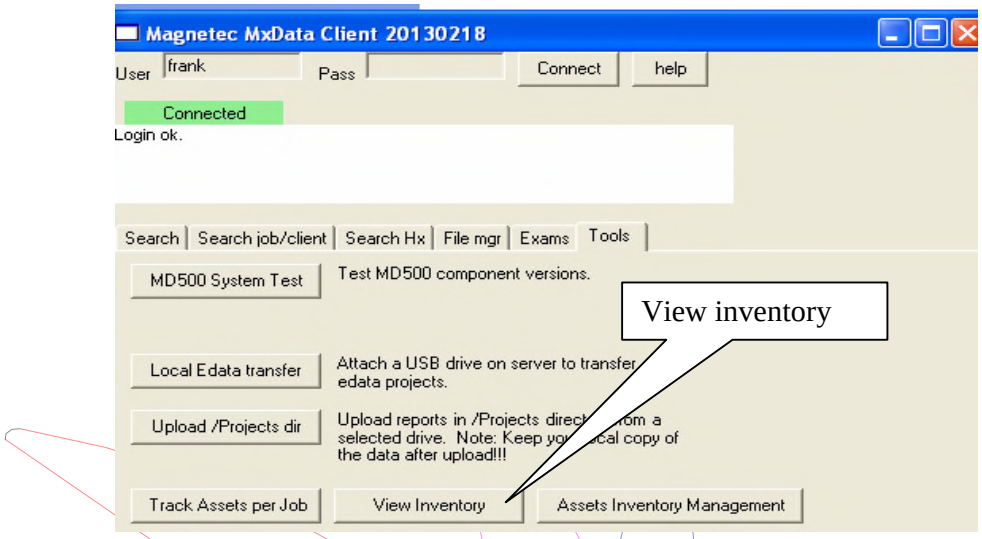



7. You will now have to print a paper copy of the equipment list. Press the Print Tracking Report – Job (see photo above). Select the appropriate printer and print at least 2 copies of the report. One copy will go in the Check out tracking box located just to the right of the check out station and the other copy will go in a clear protective sheet along with the probes to have a quick probe reference on the job site. If the job requires a large amount of staff, consider printing out more than one copy for the site to give to other personnel such as the secretary, the night shift foremen, and other important personnel.

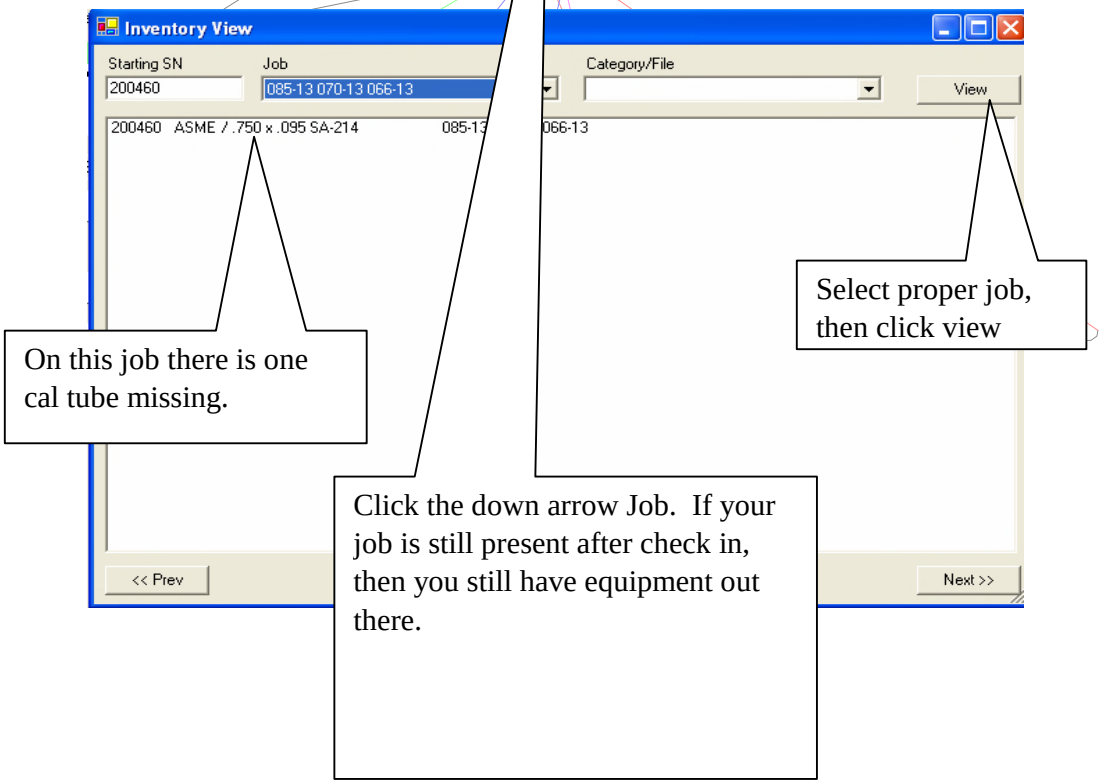
8. Remember to take inventory of your probes and cal tubes throughout the job. Good examples would be after a large amount of probes were removed from the bins at one time, when 50% of the job is complete, and at the end of job.

9. Checking the probes back into the system should be performed before the cleaning, repair, or decommission process begins back at the shop. Type in the job number, acronym, and lead name ex. 001-14 MPLA Ethan. Scan or type in all of your probes and cal tubes. Once you have every correct bar code in, click the green Check IN box in the lower right hand of your open screen. You will get a confirmation in the empty box on the right saying that each piece of equipment has been checked in.

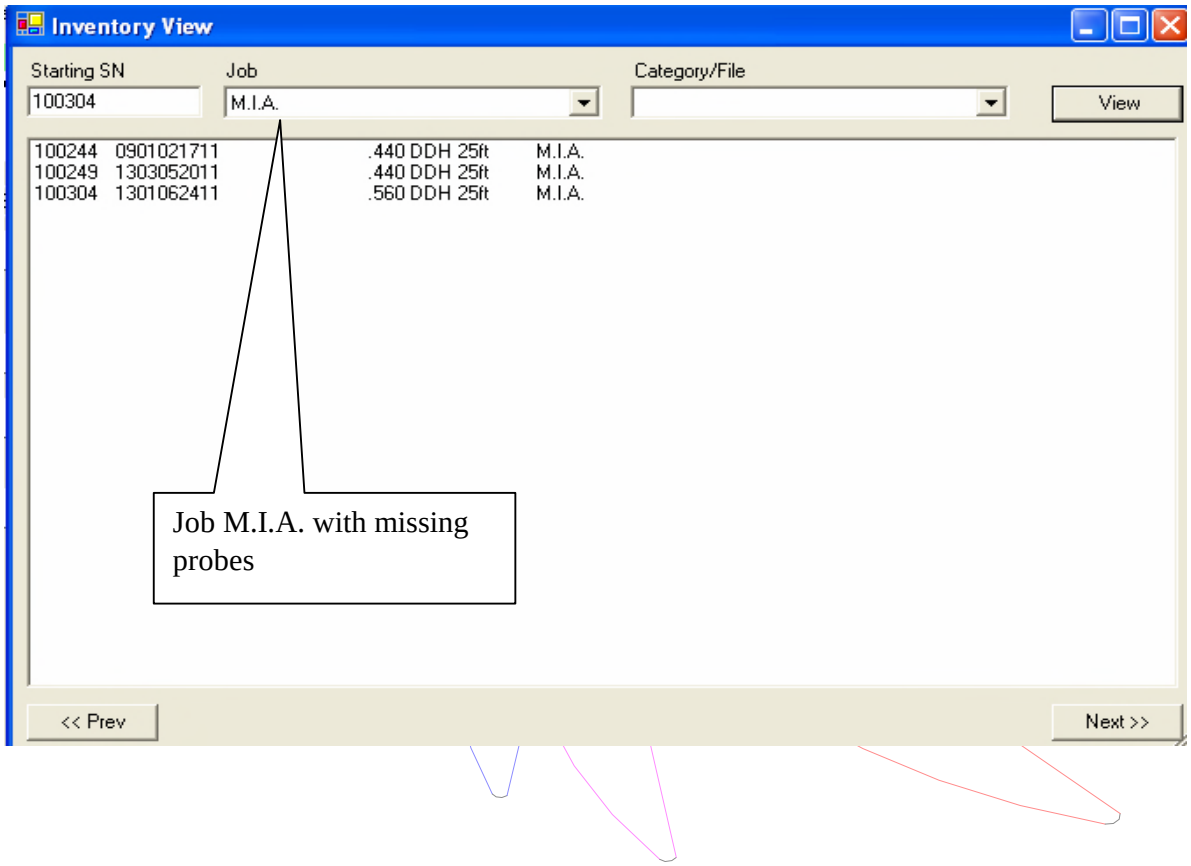
10. Check and see that there is no missing equipment by exiting out of the Track Assets per Job window and then clicking on the View Inventory window. (See photo below)




11. In the middle of the window you will see Job. Click the down arrow and you will see a list of all the open jobs. If your job is still on that list, then you still have something checked out. Click on your job number and then click View at the top right of the screen. You will then get a list of each piece of equipment, the bar code and a description of what it is. You now have to dig, check, search, investigate, and/or hunt down where this equipment is.



12. If the equipment is not discovered after a significant amount of time (two or more weeks), then you will need to manually type in the barcode(s) to check in the equipment. You will then need to retype that same barcode(s) in and check out that equipment to the "job" M.I.A. This will allow us to identify that equipment is missing in order to replace it, or in case it shows up months later; allowing us to just check it back into the system. Caution: There will always be a hard copy and a file on the server, so don't check in a probe that is actually missing to hide the fact that you lost it. You will be discovered when we take inventory!




13. Note: All probes must be logged out to the specific job or person that they are on at all times. If probes or cal tubes are being switched to any other location other than what they were checked out to, then they must first be checked into the system (See step #9). You then must check them back out to the proper job acronym that they will be heading to (See steps #4-6). This does not matter if the probe is bad and you are giving it to another person. If there is a different checkout acronym that it is being transferred to, then it must follow the steps above. This way we do not forget to do this process later, re-build the probe with a different barcode, making it appear as if that job acronym had an extra probe, when there really isn't one (ghost probe).

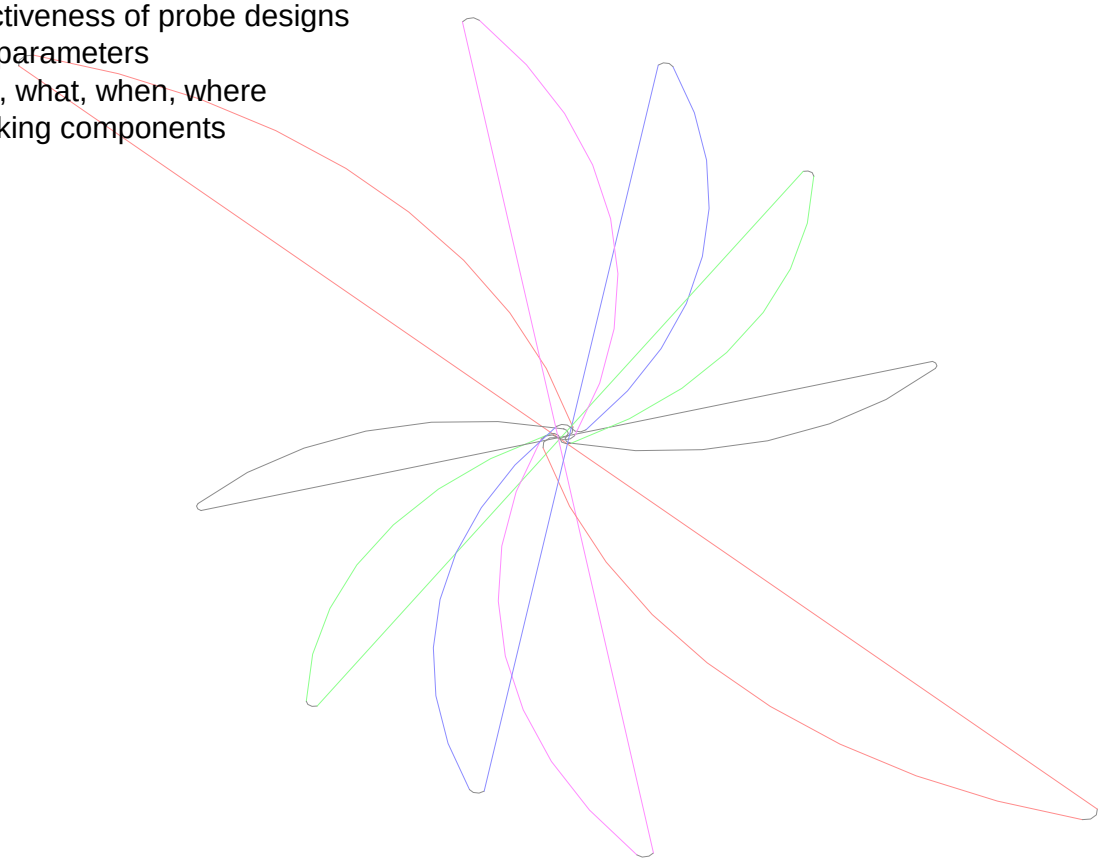
14. Note: All barcodes being built/added in the system or being decommissioned/taken out of the system will be done by specific personnel only. For example when a new probe is built only that specific person enters the new barcode into the system for tracking.

# Probe Manufacturing

All routing sheets for robe manufacture need to be completely filled out. That includes every line at the time of manufacture.

Our goal is to track the manufacture process of our probes o that we can determine the following:

Where improvements can be made
How the manufacture process can be adjusted
Effectiveness of probe designs
Coil parameters
Who, what, when, where
Tracking components



# Job Site Preparation

As an inspector with this company your equipment, vehicles, etc. will be available for inspection.

You will follow the following procedure when you enter a plant.

Upon entering a plant you will take 10 min to prepare your vehicle for the days inspection. This would include the following.

1) Clean as required from the previous day. Remove trash, clean desks,etc.
2) Prepare and probes that may be expected for the days inspection.
3) Confirm that your inspection equipment is ready for work. Check red wire and head phones.
4) Charge all batteries required for the job. There will be no more uncharged batteries.
5) From work scope, HX or shift turnover the days work scope. Discuss with other inspectors and prepare for your inspections of the day.
6) Monitor your vehicles condition for required gas, air in tires, system battery, etc.
7) Restock as required. Tape, paper towels, cleaners, etc.

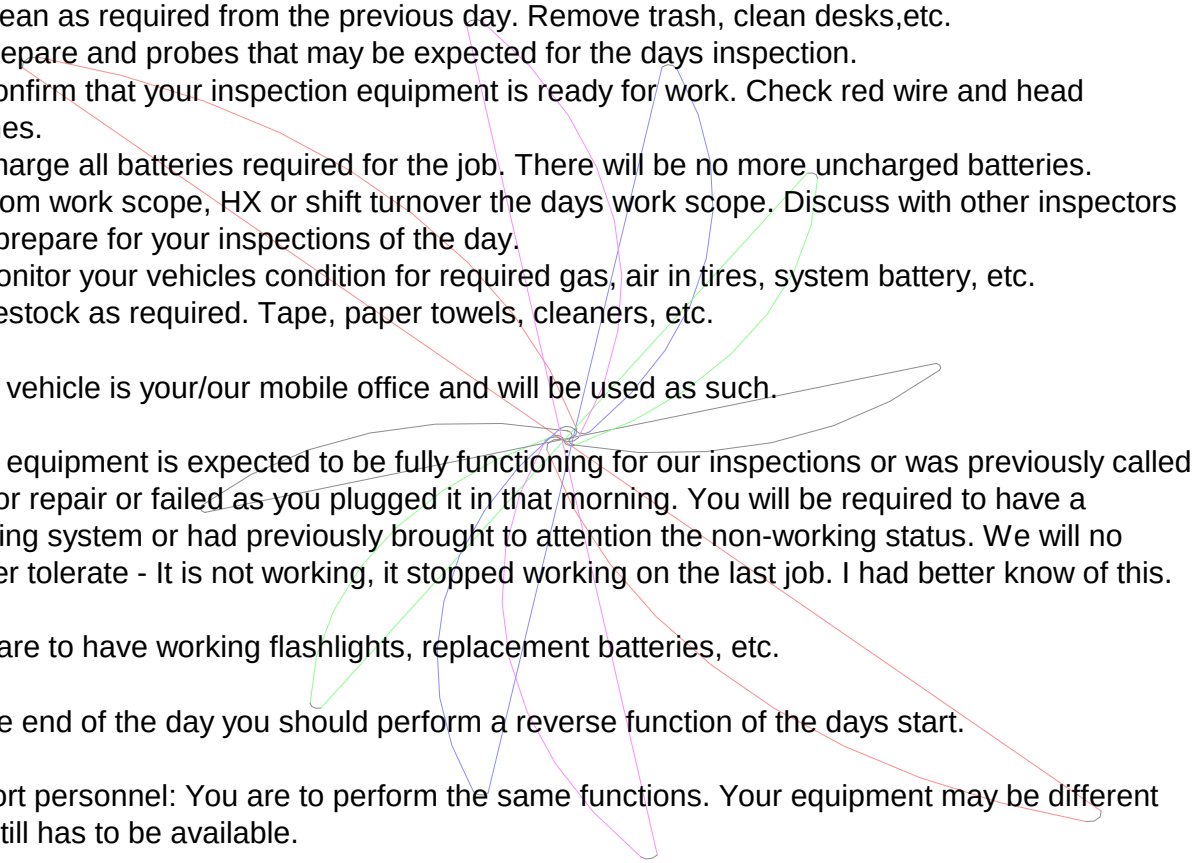
Your vehicle is your/our mobile office and will be used as such.

Your equipment is expected to be fully functioning for our inspections or was previously called out for repair or failed as you plugged it in that morning. You will be required to have a working system or had previously brought to attention the non-working status. We will no longer tolerate - It is not working, it stopped working on the last job. I had better know of this.

You are to have working flashlights, replacement batteries, etc.

At the end of the day you should perform a reverse function of the days start.

Report personnel: You are to perform the same functions. Your equipment may be different but still has to be available.

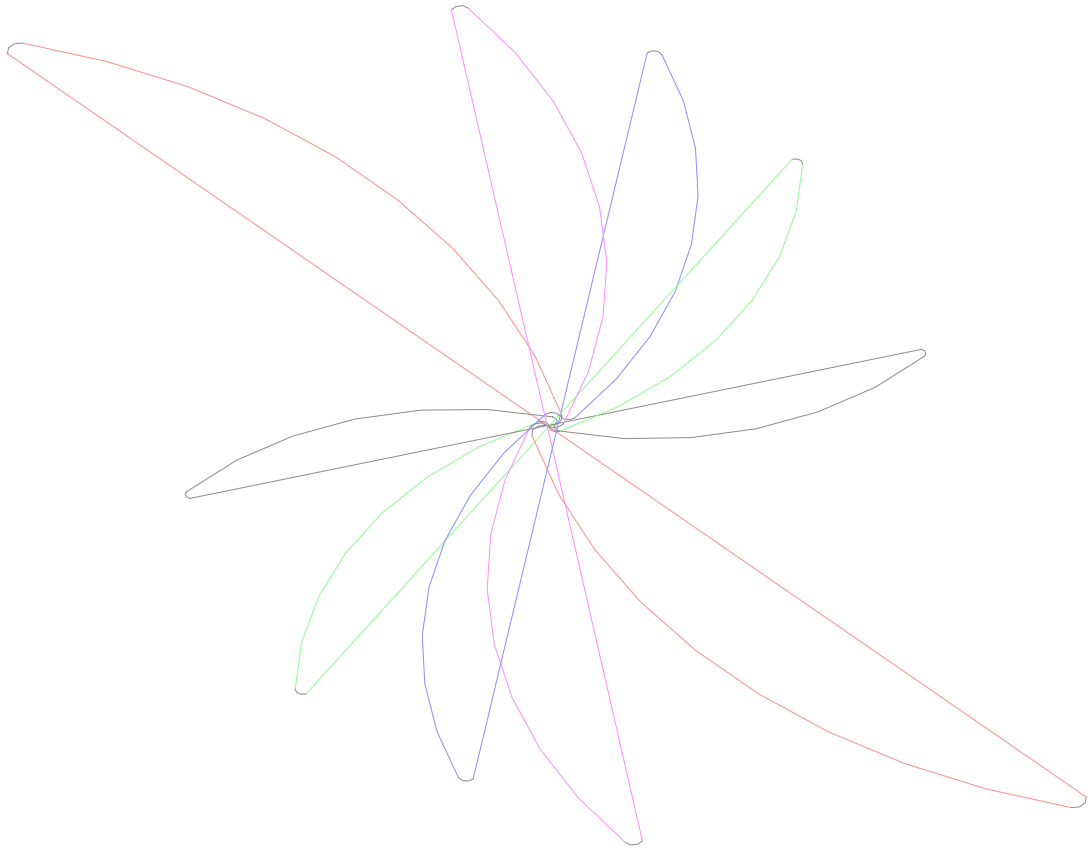


# Returning Equipment to the Shop

Your returned equipment needs to be organized and properly aligned within the shop floor.

There needs to be a return label clearly depicting your equipment. This would/could be the original label to made to label your equipment as you were preparing your job.

Adhere to the procedure.



# Ordering Supplies

If you are ordering supplies for the shop this is the procedure:

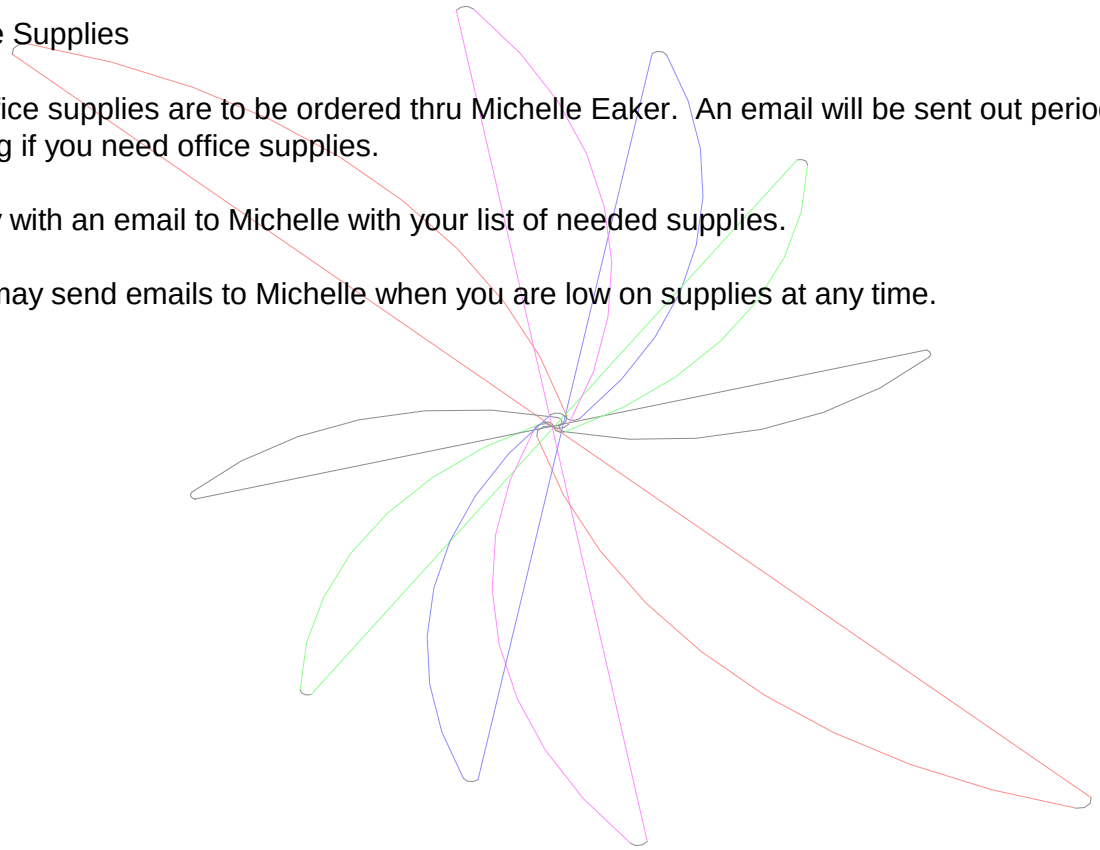
1. Get approval first from Ethan.
2. Get an order confirmation
3. Write what you ordered and what company it is for on the receipt/confirmation
4.Verify the order is received.
5. Put receipt in Bookkeepers in box.

Office Supplies

All office supplies are to be ordered thru Michelle Eaker. An email will be sent out periodically asking if you need office supplies.

Reply with an email to Michelle with your list of needed supplies.

You may send emails to Michelle when you are low on supplies at any time.



# Our Product

Our product is our reports. In preparing for a report there would be an inspection process.

The inspection performed should take into account the reporting process and ultimately the final product - our supplemental report.

With this in mind you need to perform some additional functions while in the inspection process. These have to do with the pulling process.

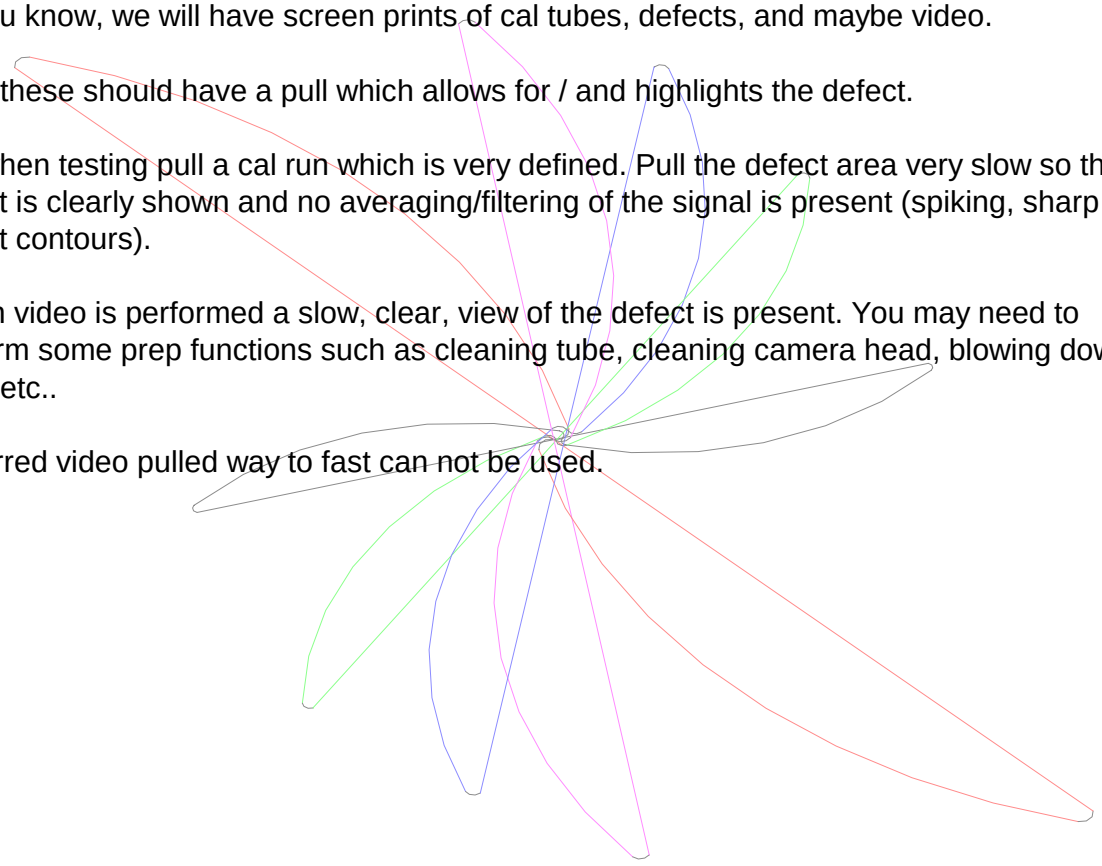
As you know, we will have screen prints of cal tubes, defects, and maybe video.

All of these should have a pull which allows for / and highlights the defect.

So, when testing pull a cal run which is very defined. Pull the defect area very slow so that the defect is clearly shown and no averaging/filtering of the signal is present (spiking, sharp defect contours).

When video is performed a slow, clear, view of the defect is present. You may need to perform some prep functions such as cleaning tube, cleaning camera head, blowing down tube, etc..

A blurred video pulled way to fast can not be used.



# What makes a good Report?

The following items are what really help make a good report for the client.

1. Pressures, temperatures and dates - with out these items, several pages of the supplemental report can not be calculated and can not be included in the report. These pages are what make our reports stand out from our competition.

2. ID/OD condition- Where is the corrosion in the tubing? Along the full tube length? Top or bottom half only? Between supports 4 thru 6? Just putting 15-25% cooling water corrosion is not good enough.

3. Type of corrosion - Writing 50-70% wall loss is not good enough. Is it pitting, general corrosion, thinning or a combination of some sort?

4. Blocks - If there are blocked tubes, are they blocked due to damage or cleanliness?

5. Histories - Please obtain histories. This really helps make our reports stand out from the competition and also helps you as an inspector see what problems have occurred in the past and what to look for during this inspection.

6. Tube and Row Space - The DC can not fill this in or measure it from where we sit. Please fill this out for us.

7. When your information matches - saying there are combined wall losses of 35% when the csv only says there's 25% wall loss is hard to claim. Writing 8 plugged tubes and there are really 11. Or the tube ends are square and full and the pictures show jagged, pitted tube ends? Or a past report says 20% wall loss and now there's only 15% without any explanation as to why. Corrosion DOES NOT get better.

8. Captions for screen shots, video stills, photos.

9. Measurements - The DC can not measure support spacing, deflection plates, tubesheet diameters.

# File Folder Structure

Folder / File structure for all work in progress - field operations and data central

Create a folder named Magreports
Inside the Magreports folder there will be folders named Jobs_2006, Jobs_2007, etc.

Inside these folders should be all job folders for that year titled with the Job ###_YY_CLIENT ACRONYM_MMMonth abbreviation(3 digits only in CAPS only!). 106_07_BPHOH_06JUN **

Inside these folders will be where all your folders/files for all information pertaining to that particular job go. This should include separate folders for:

• All .pdf files. Name folder as: ###_**YY_CLIENT ACRONYM_MMMonth_PDF**
Ie. 106_07_BPHOH_06JUN_PDF. This gathers them for easy mailing later on!
Of course any .pdf file name will be a duplicate of the file it was generated from!

• All miscellaneous forms, ie. HX, T&M, client correspondence, email, job receipts (electronic), etc. Name folder as: **###_YY_CLIENT ACRONYM_MMMonth_Forms** Ie. 106_07_BPHOH_06JUN_Forms

• All equipment. Name folder/s as:
**CLIENT ACRONYM_BUNDLE#_YY_MMMonth abbreviation**
Note: if the bundle # is part of a sister set end with a small letter instead of CAPS Ie's.
BPHOH_PR543571_07_06JUN
BPHOH_PR543711_07_06JUN
BPHOH_PR543724a_07_06JUN
BPHOH_PR543724c_07_06JUN
There may be only 1 equipment folder if it is a one bundle job or there may be hundreds depending on the size of the job.

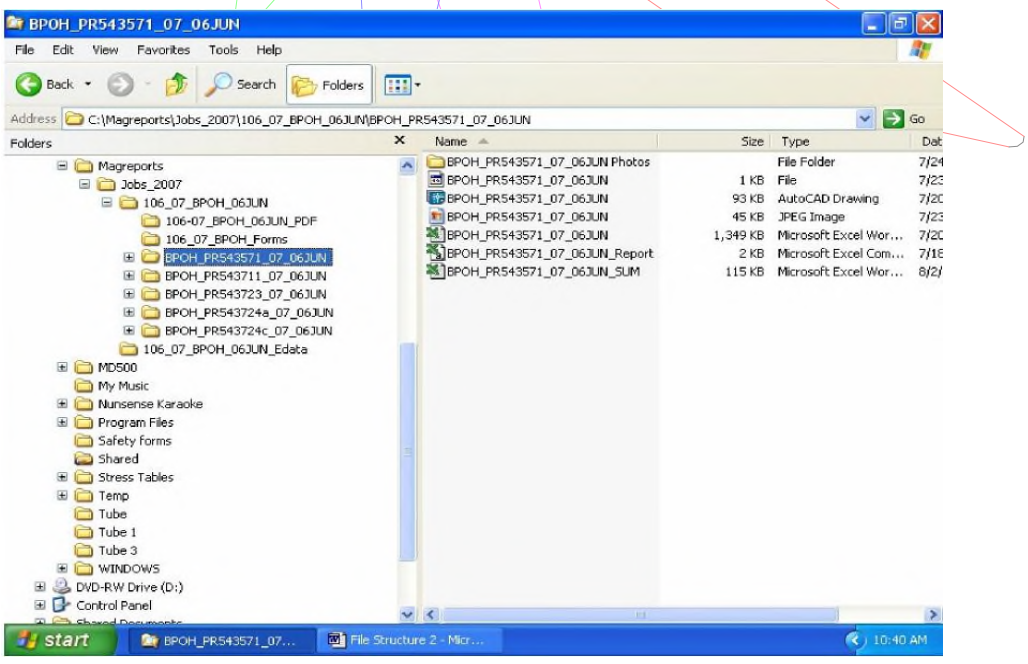
Within the equipment folder there should be:
1. Photo folder –Ex. BPHOH_PR543571_07_06JUN_PHOTOS
2. Summary file – Ex. BPHOH_PR543571_07_06JUN_SUM
3. CSV File – Ex. BPHOH_PR543571_07_06JUN *(.csv)
4. Jpeg of tubesheet map – Ex. BPHOH_PR543571_07_06JUN *(.jpg)
5. TS of tubesheet map - Ex. BPHOH_PR543571_07_06JUN *(.ts)
6. Screen shots Ex. BPHOH_PR543571_07_06JUN_Screenshots
7. Field Inspection Document Ex. BPHOH_PR543571_07_06JUN_FID
8. 3d Drawing Ex. BPHOH_PR543571_07_06JUN_3D
9. History - Ex. BPHOH_PR543571_07_06JUN_History

Data central personnel will also have files for ACAD and Excel final reports:

*** Illustrated here are some typical file extensions. They are automatically attached (though maybe not seen depending on how one has there VIEWS set in My Computer or Windows Explorer) when a file is created. DO NOT ADD THEM MANUALLY. This is unnecessary and now effectively adds to the file name something not wanted! If one wants to distinguish between different file types with so many exact same names just notice the different Icons that precede each file name. They are each different.**

Inside the Forms folder there should be an HX status form and maybe T&M file.
Name HX status forms as: ###_YY_Hx-CLIENT ACRONYM_MMMonth abbreviation Ie. 106 07_Hx-BPHOH_06JUN
Name Time Sheets as: ###_YY_T&M_CLIENT ACRONYM_MMDDYY
Ie. 106-07_T&M_BPHOH_062307, 106-07_T&M_BPHOH_062407, etc.

**** Also inside each Jobs_2006, Jobs_2007, etc. folder should likely be separate folders to contain any Edata collected in testing. These files are large in total and need to be kept somewhere in order but separate from the job folders. In them can go each separate folder generated by the MD500 recording process. They will ultimately be burned to a CD.**
**Then they can eventually be deleted off the hard drive in order to free up valuable disk space. On that note it need be stated that it is a good idea to routinely police all folders sites and delete any unnecessary files that may have been generated during normal operations. Ie., backup (.bak) files eventually no longer needed and maybe any extra photo files that were no good or just duplicates or something. Keep It Clean!**
**SEE ILLUSTRATION BELOW**



# Reports

1) You must sent a copy of your completed field reports to "Data Central" and to the customer.
Enter an E-mail group on your machine as "Data Central" which includes Leigh, Michelle, Ethan, Angie, Donna. Send all reports to Data Central, the customer, and copy yourself. If you copy yourself you can be sure that the E-copy at least went through the host system. It is your responsibility to make sure the customer gets his copy. Either a note to return an "I got it" response or call him/her should be completed to confirm.
Do not assume that someone will complete this task for you.

2) Make a field report as complete as possible.

3) Keep a copy of all reports on your computer. In case other systems crash.

Field Inspection Reports:
The Field Inspection reports should be issued ASAP to the customer (24 hours max). Keep in mind you will have to monitor, juggle your time on a job to allow for time to complete this process. Don't wait until the job is over to do multiple reports. Obviously the bundle inspection regulates the timing of the field report typing and we should not hold up an inspection of a high profile bundle but the reporting of the inspections is as important as the inspection.
Try to do the field reports on the customer clock. They need to pay for this time as it is part of the inspection process.
At the end of the job burn a CD/copy to stick or hard drive for the file box. Keep your electronic copy till years end. You must send a copy of all reports to "Data Central."

You must upload your reports and other relevant files (IWR, etc.) to the MII app.

When you are going to issue a report (.pdf) you need to first read report for content and then for context.

Content - Is all the information there, are all lines and issues addressed, are there the following:
Summary page - This page needs to be completely filled.
Tabulation page - Do the numbers look right.
Drawing - Does the drawing go from square to Tri pitch. Indicates something is wrong.
History - Is history complete.
Data pages
Photos - Are photos in focus, are they sized for the page.
NDE- Is filled out?
3D - Does it fit the page parameters
Screen shots- are they captioned
TS-Is the ts correct
Limitations - Are these tabs needed

Check for double words, mis-spelling, run-on statement, etc..

DO NOT INSERT BLANK PAGES AND OVER-PRINTS INTO EITHER THE PRINTED OR PDF'D VERSION.

Context -
Does the report make sense, Does it describe the corrosion patterns,type, when, where,why.

After reading could you make an informed decision on the bundle.

Do the sentences lead to a logical outcome. Is there a, weaving together of words, connection of words, coherence.

Are there interrelated conditions in which something exists or occurs.

Documenting the current condition of the bundle correctly is a significant part of your job and your ability to perform this task will be weighed against your job.

There is a location on the field report that asks for the "Physical Measurements"

<Examination of tube I.D./O.D. condition>

These should have some measurements. Do not leave blank
The following are to be adhered to when directing reports to plant personnel.

1) You are to deliver our summaries, reports, time sheets, final reports, .PDF's, tube samples, preliminary inspection results, etc only to plant personnel (Assumably your original contact).

You are to complete all forms, check-off boards, etc by yourself.

We will not provide any information to outside contract personnel, contractors, contacts, etc. If your contact is an outside contractor you must ask for a plant contact.

We have had intellectual property stolen, reports not forwarded, check-off boards not completed, tube samples not delivered, verbal information not reported.

If the plant has a problem with this have them call Ethan directly.

Any plugs, repairs, findings, etc should be marked on tube sheets for reference.
You will need to take a photo (YES in focus/ see below.)

Old Reports
We have been performing inspections for our clients for many years and you should assume that we have inspected any bundle you may currently be working on at least once before. With that in mind, any report you will generate today should correlate with the previous findings and report. For this reason you will need to do a search for a previous report prior to issuing current inspection results. It is for this reason that we have a file server.

As part of the inspection process one of the first considerations is to look for old data and old reports as reference material for the current/subsequent inspection. You must make some reference to an old report if there is one.

Do not send reports without a complete search and with reference to any old reports we may have.

This is done with MxDataClient - Make sure you know how to use it, search with it, download reports with it.

ASSUME THERE IS AN OLD REPORT FOR EVERYTHING. SEARCH FOR IT.

You can always tell how in depth a job is by how many pens you run out of ink.

One lined report statements are not acceptable. I know of no HX item that can be discussed in one line to any level of satisfaction. There is always a past, present and future to every statement.

No reports will be set aside for more than one shift for review. The report writers will issue the days prepared reports at the end of the day. We will not sit on multiple reports waiting for review.

An exchanger inspected at the end of the day and whose report is entered into the "In Box" at end of shift would not have a report completed yet and as such would be issued the next day.

The above rule will mean that the initial inspector needs to get the report right with correct info, verbiage, etc.

It also means that the report writer needs to find, change, correct, proof, read for content/context the reports they prepare. We intend to hold the report writers responsible for mistakes they make. This position is no longer an enter text position.

There can be no items left open.

The report writer can and will change specific wording to make the report read correctly. They will not simply enter text. If you have concerns as to wording please discuss the change with the report writer. The general meaning of the wording should not change only the words chosen to make the specific point.

The report should be at college level reporting at a minimum.

This includes all personnel and will not be changed for specific employees.

Limitations Tabs
The limitations additions are:

1) Mechanical
2) Blocks

These are to be utilized in much the same way as the basic limitations and/or may be used in combination.

They need to be spelled out by the inspector for their addition to the report on the field reports. (e.g. Please add the mechanical limitations tab on report)

Assuming have a blocked tube (yes even 1) you will add this to report.
Assuming you have mechanical damage (yes even 1 ) you will add this to report.

Scenario (s):

You have tested a poorly cleaned bundle with deposits and blocks. You will add limitations and blocks tabs to reports.

You have tested a cleaned bundle with one or more blocked tubes. You will add blocked limitations tab.

You have tested a cleaned bundle with one or more blocked tubes and mechanical damage. you will add mechanical/restricted and blocked tabs.

Report writers:

When in doubt and if not requested for addition but the conditions have been reported on (eg. blockd tubes) you will add specific tab.

Inspectors:
If you have any one of the condition you will add the specific tab.

Blocked tubes.
If you have blocked tubes in a bundle you must inform client ASAP. This should probably be a E-mail to client rep. discussing the following:

Bundle name
Block type - complete/partial
rough numbers or %

They may want to perform additional cleaning.

We have always tried to perform inspections with somewhat questionable tubes with regard to cleaning however if you have a question as to the data you are getting, you are running a undersized probe, etc. then ask for the bundle to be re-cleaned.

Captioning Photos, Screen Shots, Video Images

Definition of CAPTION
1: the part of a legal document that shows where, when, and by what authority it was taken, found, or executed
2a : the heading especially of an article or document
b : the explanatory comment or designation accompanying a pictorial illustration
c : a motion-picture subtitle

When turning in photos, drawings, screen prints and video shots, please add a caption to the item to aid in forwarding the information that is intended. A screen print of say ECT data will mean nothing to a non-ECT person and will only make some degree of sense if there is a caption that follows.

If you want the report writer to use/insert a caption then you need to add something in the report.

"OH HERE, a screen print" does nothing but confuse the reader. Every part of our reports must provide direction to the meanings, conclusions, findings, data, etc...

Here is an example - Screen print of 100% defect in calibration tubes, or "Note the pit defect at 3 o'clock position", or "example of deposits encountered", or "photo of mechanically damaged tubes", or "seam weld corrosion", or "failure in tube".

A caption could be a statement above an item, within an item, as a balloon, as a reference statement, etc...

If you do not know how to add a balloon to an item in Exel or Word - find out.
Go on-line and find this information out or ask someone.

In addition, go on-line and find some technical writings and read not so much for the informative content but for how the author ties the information together and how different writing implements (such as captions) are used to aid in delivering the text and info to the reader.

As has been previously discussed. There will be a screen print of the calibration tube and good tubing on all projects.

Certainly for all non-ferrous materials there will be these screen prints added to all reports (finals and supplementals)

DO NOT SENT OUT A REPORT THAT IS NON_FERROUS WITHOUT THESE ADDITIONS.

The following has been noticed as missing information on reports.

Serial Numbers
NB#'s
Service - every exchanger has a service.
Full and complete recommendations - Keep up cleaning schedule is not a recommendation.
Row and tube list - This can not be left blank
Previous plugs - These need to be listed.
Wall loss locations - Every defect has a location "0" is not a location.
List of tubes tested - I guess if we tested something it should be reported.

Please make sure these are reported on. Do not leave information blank. Every line has a function.

Issue NDE pages with all reports regardless.
Again, a lot of the info that goes into the NDE page has to be derived from the technique page that MD500 can generate Project>Technique report.
And what is NOT to be done is to simply insert that MD500 JPG into/on top of the NDE page. DO NOT DO THIS!!!
Learn how to use the NDE page properly.

Data Pages.

ALL DEFECTS HAVE LOCATIONS.

There is no such thing as a defect with a location of "0"

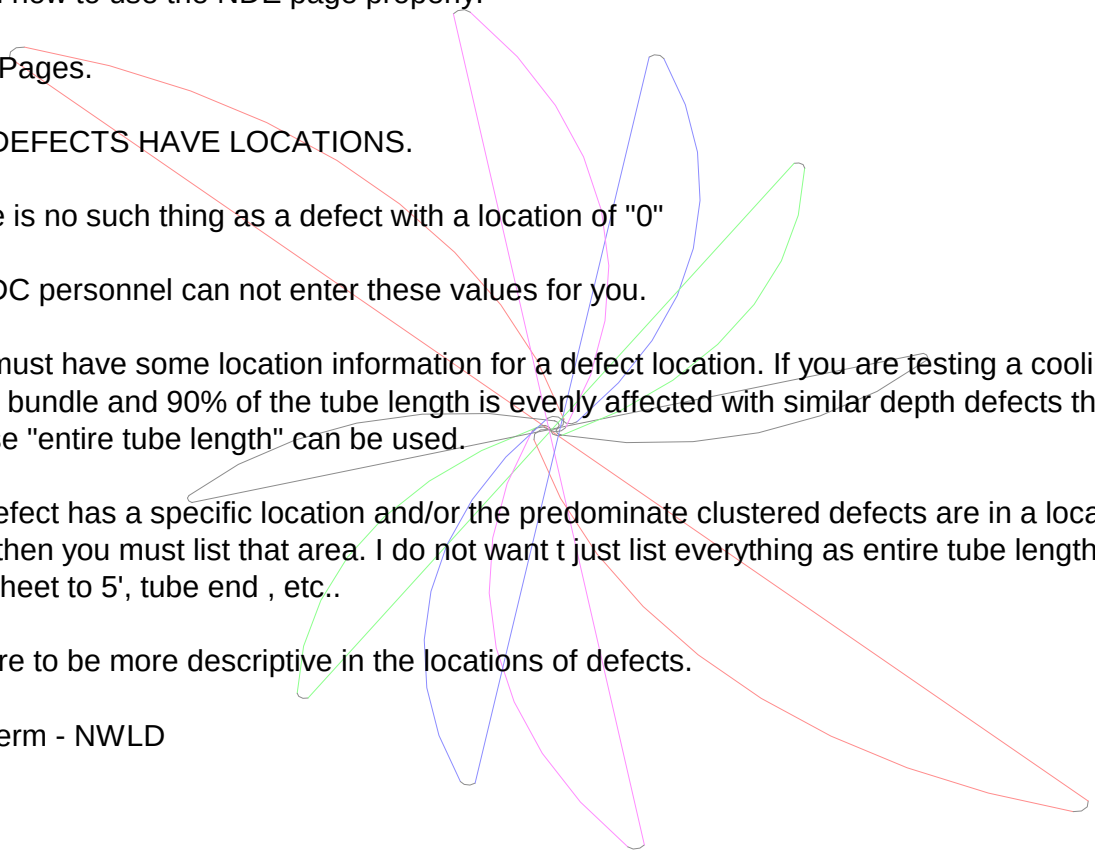
The DC personnel can not enter these values for you.

You must have some location information for a defect location. If you are testing a cooling water bundle and 90% of the tube length is evenly affected with similar depth defects the phrase "entire tube length" can be used.

If a defect has a specific location and/or the predominate clustered defects are in a localized area then you must list that area. I do not want t just list everything as entire tube length, tubesheet to 5', tube end , etc..

We are to be more descriptive in the locations of defects.

The term - NWLD



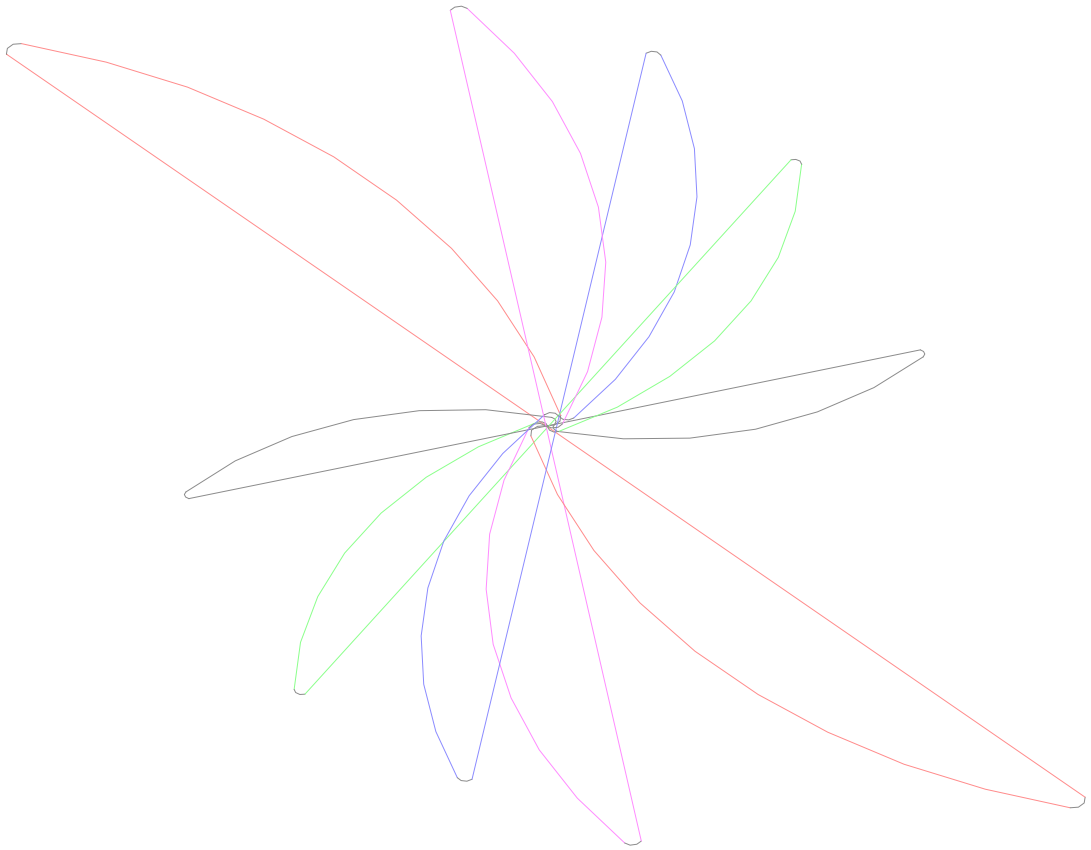
Can not be used in a report. Only we know what this is.

You can not put - The tubes are NWLD (Now Where is my Lost Dog)

You MUST use wording such as:

No wall loss detected
No metal degradation
No active material loss
No corrosion to parent tubing
ETC..
ETC..
ETC..

3d Drawings
Any bundle over with 50% or greater wall loss will have a 3d drawing created for the report.



# Report Process Overview

This is written as a review of the process for the completion of a report.

We have had a server since late 2007 which would now have most every bundle we have inspected as we would have inspected the bundle since that time.

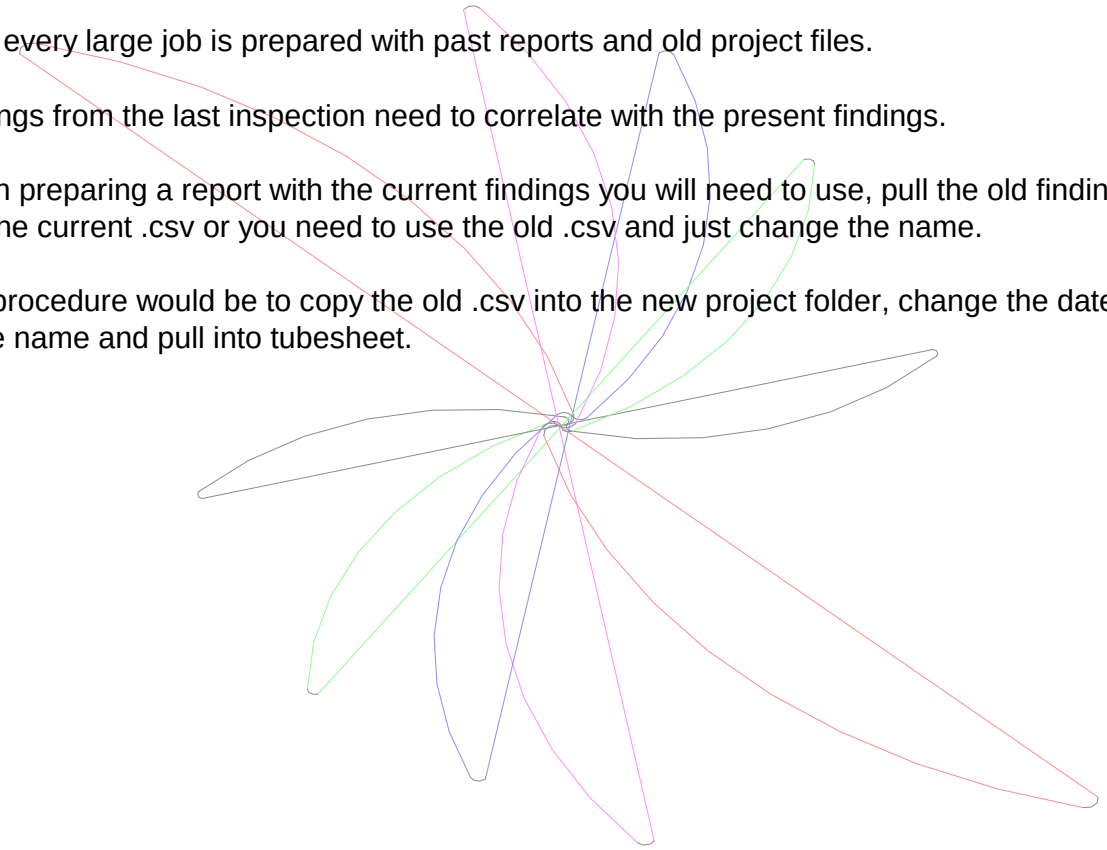
So, you would go to the server for every inspection you ever perform. Prior to a inspection, during the inspection process and certainly while preparing a report you would use the old report as a reference point.

Most every large job is prepared with past reports and old project files.

Findings from the last inspection need to correlate with the present findings.

When preparing a report with the current findings you will need to use, pull the old findings into the current .csv or you need to use the old .csv and just change the name.

The procedure would be to copy the old .csv into the new project folder, change the date part of the name and pull into tubesheet.



# Report Manila Folders

Below is the information which is to be in the folder. If you upload info to the server, you must still complete the contents within the manila folder. We have not changed and procedures with regard to the contents of the folders and never will.

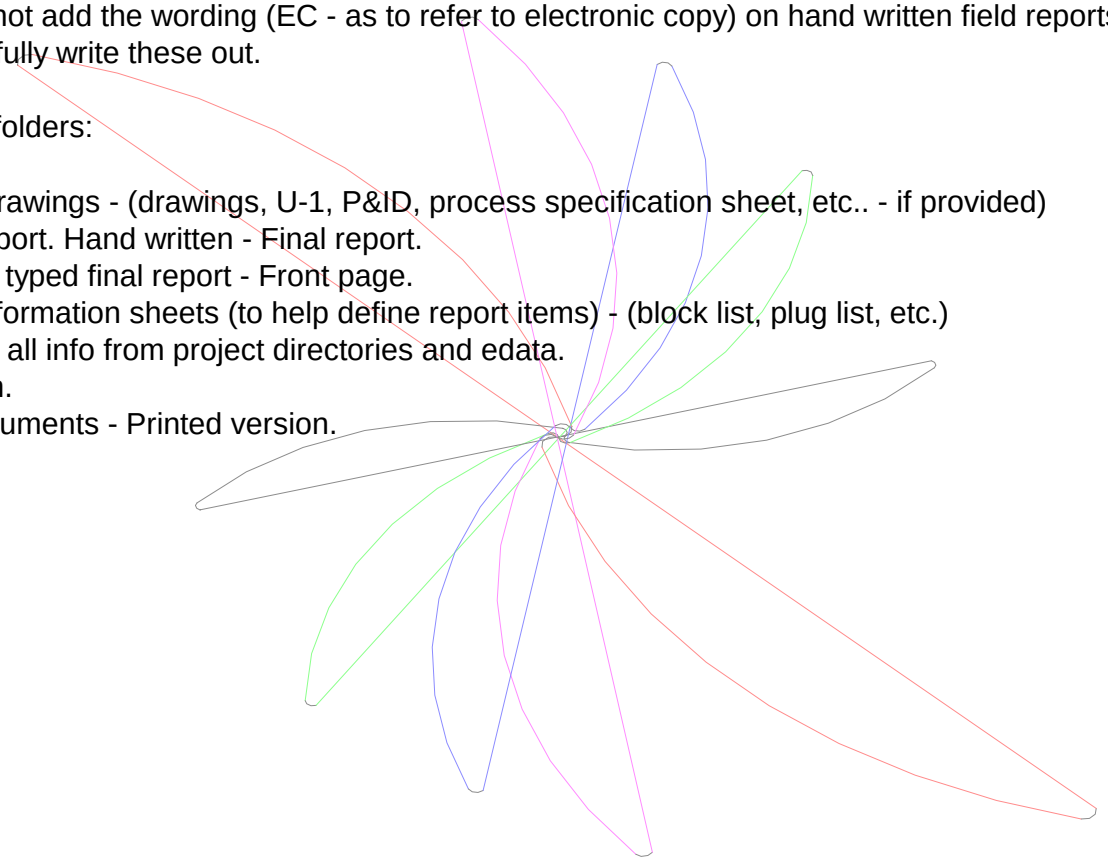
Do not give incomplete folders to the DC personnel. Their job is to complete the reports from the contents of the manila folder and yours is to make sure the project folders are complete.

If you are a second inspection on a piece of equipment (say bundle is dirty and you return to inspect after cleaning) you still need to complete a full project folder (manila and electronic).

We do not add the wording (EC - as to refer to electronic copy) on hand written field reports. Please fully write these out.

Report folders:

Client drawings - (drawings, U-1, P&ID, process specification sheet, etc.. - if provided)
Field report. Hand written - Final report.
Copy of typed final report - Front page.
Addtl information sheets (to help define report items) - (block list, plug list, etc.)
CD with all info from project directories and edata.
HX form.
FID documents - Printed version.



# Report Changes

The following is a fictitious scenario to aid in documentation of changes, differences, additions, etc. that may occur post-inspection. Many other scenarios are possible in which an original inspection has additional information that needs to be correctly integrated into the report process.

Scenario:
You're at MPLA for a job and you have completed the visual and ECT inspection for the bundle 1234E0001. The field report is written, the electronic files are completed, and you are about to start typing up the summary. Since you have green tagged this bundle, it is being loaded for removal from the bundle bad. As you are in your truck typing away, you hear the bundle fall off of the loader and miraculously, only one tube was severely damaged.

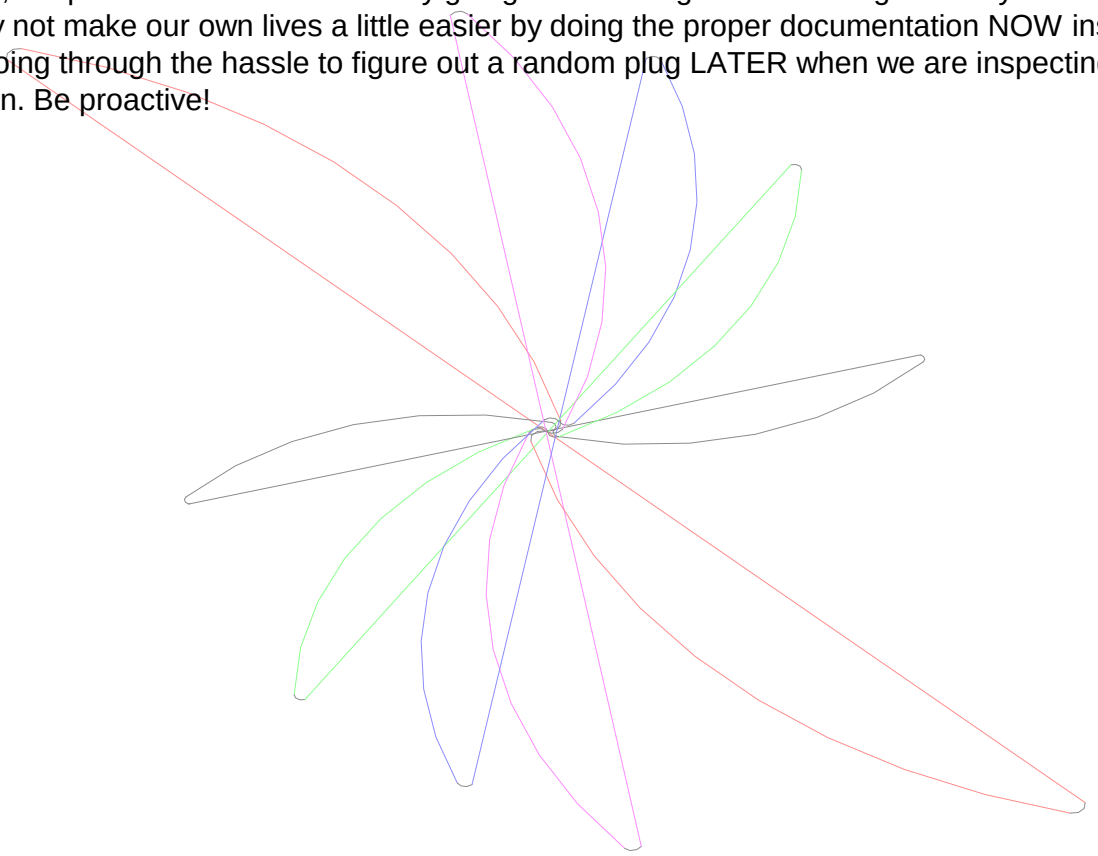
Now what?

There are a series of questions that should run through your head with the first one being 'What do I do now?'

You now need to go visually reassess the bundle to ensure that there was, in fact, only one tube damaged. You have rectified this information and determined that the severely mechanical damage has deemed it necessary to install a plug.

From here, take the following steps for documentation of the mechanical damage and plug recommendation:
1) Take sufficient photos of the damage. Minimum photos required are:
a. Fixed tubesheet photo with red paint markings indicating the plug
b. Photos of the mechanical damage
c. Full bundle profile with mechanical damage
2) Properly place a red tag on the bundle with all necessary information
3) Inform plant contact and bundle pad operator
4) Fill out R&R form, MII repair log, or other form that we/the plant may need
5) Update Hx form indicating that a plug was recommended
6) Make notes, corrections, additions to Field Report (See Plug Installation Field Copy Changes.pdf)
7) Update *.csv, *.ts, *.jpg
8) Create a Plug Map *.jpg
9) Include this information in summary.

Ensure that there is ample explanation and reasoning for having an ECT inspection performed for this tube (assuming that it was in the inspection pattern) even though it would be clearly inaccessible for testing. Also make sure to explain the timeline in which this M/D happen – as in it happened after you were done with everything.
It is highly important that we, as a company and good inspectors, are thorough, comprehensive, and reliable. We always do what is best for the bundle and for the situation. Also, keep in mind that WE are likely going to be testing this bundle again many more times. Why not make our own lives a little easier by doing the proper documentation NOW instead of going through the hassle to figure out a random plug LATER when we are inspecting it again. Be proactive!



# Bundle Type

These two lines on the field copy / report are completely separate. They are not related.

The "TUBE/BUNDLE TYPE:" asks, "Is the bundle straight
If not, "are they vertical u-tubes or horizontal u-tubes"

Then it asks you if the bundle sits horizontally in the service location or vertically in the service location

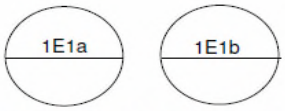
| | | | | | | |
|---|---|---|---|---|---|---|
| **TUBE/BUNDLE TYPE:** | ☐ Straight | ☐ Horizontal U Tube | ☐ Vertical U Tube** | ☐ Horizontal bundle | ☐ Vertical bundle | |
| **BUNDLE/MULTS. ORIENTATION:** | ☐ Single Hx | ☐ Multiple Hx -- | ☐ Horizontal -- | ☐ Vertical | TOTAL Hx: | |

## BUNDLE/MULTS. ORIENTATION:

This line asks if the bundle is single or is there a sister / sisters to this bundle.
If there is no sister(s) SINGLE HX should be checked

If there ARE sisters, MULTIPLE HX should be checked. The next 2 boxes are for the orientation/alignment of the two bundles:

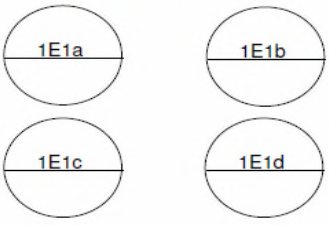
Are they sitting next to each other like below?




Multiple and Horizontal should be checked

Or are they stacked on top of each other like below?


Or if there are more than two.....




Then MULTIPLE HX / HORIZONTAL & VERTICAL SHOULD BE CHECKED!!!

# Blocked Tubes

So from here forward we want to address the issue of blocked tubes in the Red MII Recommends column of the Hx form.

We want to bring to the client's attention that there are a certain number of blocked tubes so that they are aware and can then make a decision as to what they want to do about it.

This would be a subject call on the part of anyone making those decisions including Magnetec.

If the bundle was NWLD and there were only a small number of blocks then we might say: 4 blocks/RTS or 4 blocks/NWLD/RTS.

If the bundle was NWLD but with many blocks we might say 23 blocks/re-clean/ RTS.

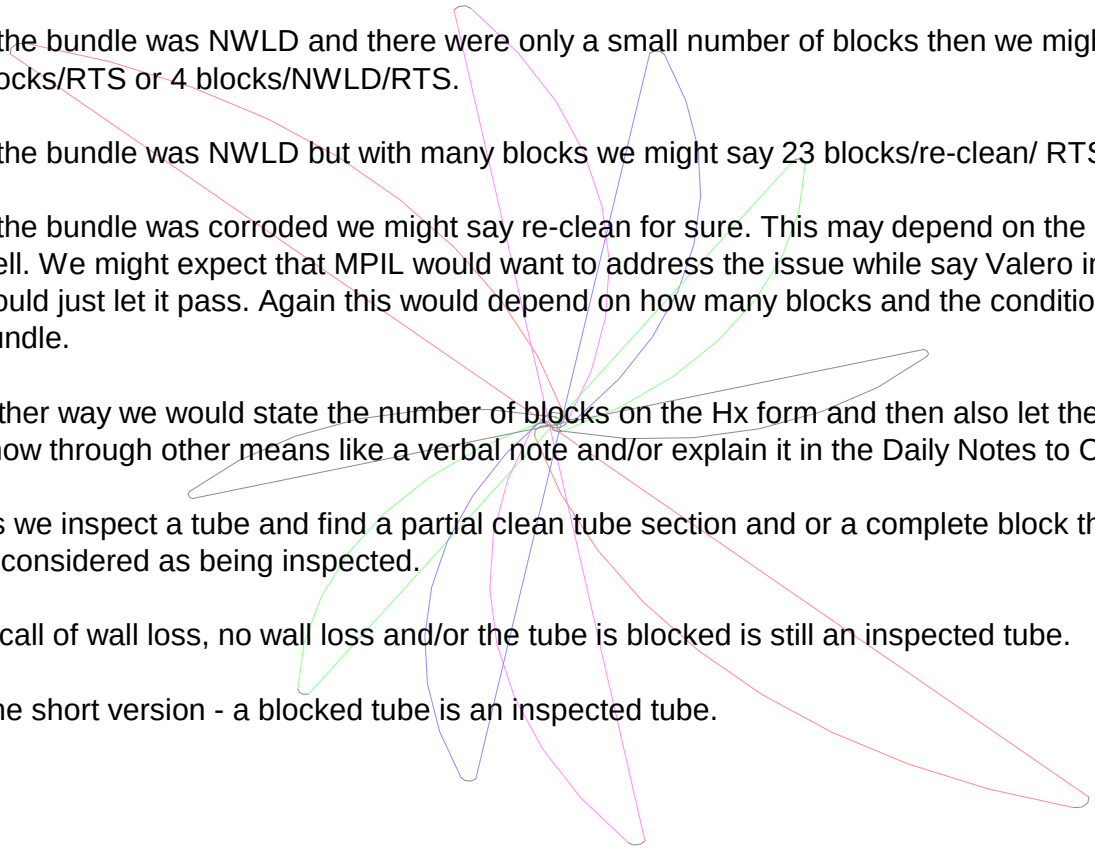
If the bundle was corroded we might say re-clean for sure. This may depend on the client as well. We might expect that MPIL would want to address the issue while say Valero in CCTX would just let it pass. Again this would depend on how many blocks and the condition of the bundle.

Either way we would state the number of blocks on the Hx form and then also let the client know through other means like a verbal note and/or explain it in the Daily Notes to Client.

As we inspect a tube and find a partial clean tube section and or a complete block the tubes is considered as being inspected.

A call of wall loss, no wall loss and/or the tube is blocked is still an inspected tube.

The short version - a blocked tube is an inspected tube.



# Limitations Tab Usage

As we all know the reports have limitation tabs which can be added to the reports to outline limitation of a specific limitation of the inspection technique. The limitation tabs speak to the problem at hand and are not discussed here. The limitation tabs are to be utilized in scenarios where the insertion to the report helps the client understand limitations that exists during the inspection and/or outlines a limitation that we need to have reported in case this limitation altered a test result. Based on these scenarios and for this reason the use of the limitation tabs must be used where required but not added in every case.
A tube may be dirty but not have magnetic altering or detrimental consequences and the specific limitations tab may not be required to be added. We want the use of the limitations tabs to carry a sense of importance which may be lost if they are used on every report.

The specific use of a limitations tab should be determined by the inspector at the time of writing the field report and/or after review of the Edata when there is a clear case for it's use. If you are an inspector and think the limitations tab should be utilized you should write in bold letters across the report "USE LIMITATIONS TAB". If you are not sure of it's use and scenarios where it would be appropriate then ask.

We do not want them in a report when not required and we don't want them missing when they are to be inserted. My intent for the use of the limitation tabs is to give us an out when the client calls about a compromised inspection. We have been there before; "just do what you can" and after a leaking hydro we get a call. "We just want to understand" is how these conversations start. How quickly the plant personnel forgets. Or when the CEO is looking across the table there is no way a unit inspector is going to say " well, I just told them to get me what they can so we did not do any additional cleaning".

We want on record some verbiage that explains the limitations of the ECT method and not a unit inspector's recollection of what occurred last month during the inspection.

There is almost no way to have a specific guideline for the usage of limitations and if possible the dissertation would not quickly lend itself to what, when, where, how and the possible scenarios would be as wide spread as the topic of corrosion itself.

Please utilize the limitation tabs as required but not as a standard insertion.

# FID
## (Future Inspection Document)

It is your responsibility to compose a FID document as required.

Your job here is to be fully engaged with an inspection and know when, where, why.

Two recent items which would always require a FID is material found in the exchanger is not what is listed on the U-1. Another is the material thickness reported on the U-1 or in our last report is not what was found.

If you are in a situation where either the plant info or our last report makes a statement that you do not agree with should be brought to my attention and once fully determined be documented in a FID so the next inspector does not trip through the same items.

Do not simply enter a changed item and walk away. We need to determine some course of action and make the appropriate noted to the reports, the client, the FID, etc..

Our client's have choices to make when issuing work scopes. We want them to make those choices with Magnetec Inspection, Inc.

Our financial well being is determined by the inspections we perform, how safe we are, how well the inspection is documented, did we carry ourselves professionally, did the cost appear correct, was the inspection performed in a timely manner, etc..

Items which may need a FID:

Changes in material
Changes in thickness
Weird locations of the exchanger
Frequency selection not normal for the tubing (say a sulfide corroded tube)
Cleaning issues
Deposits encountered
Issues with scaffold, tight inspection location
Seal weld problems hindering probe size
Findings not normal (say corrosion in TEMA grooves)
Locations of corrosion where the next inspection should key in on
50% rule
Plant upsets which caused corrosion
Reason for numerous plugs (dropping bundle)
Layout of recent retubes.

Note: Make sure your name and date are on these documents.

# IWR / FIR
# (Inspection Work Request)
# (Future Inspection Report)

Please read and make sure you understand.

1) IWR - (Inspection work request)
We issue IWR's for any repair item we generate. This is in all cases. You can not and will not simply tell the client. There will always be a IWR issued. The IWR will be issued as soon a possible after the finding.

Do not call me about a specific scenario. Issue an IWR.

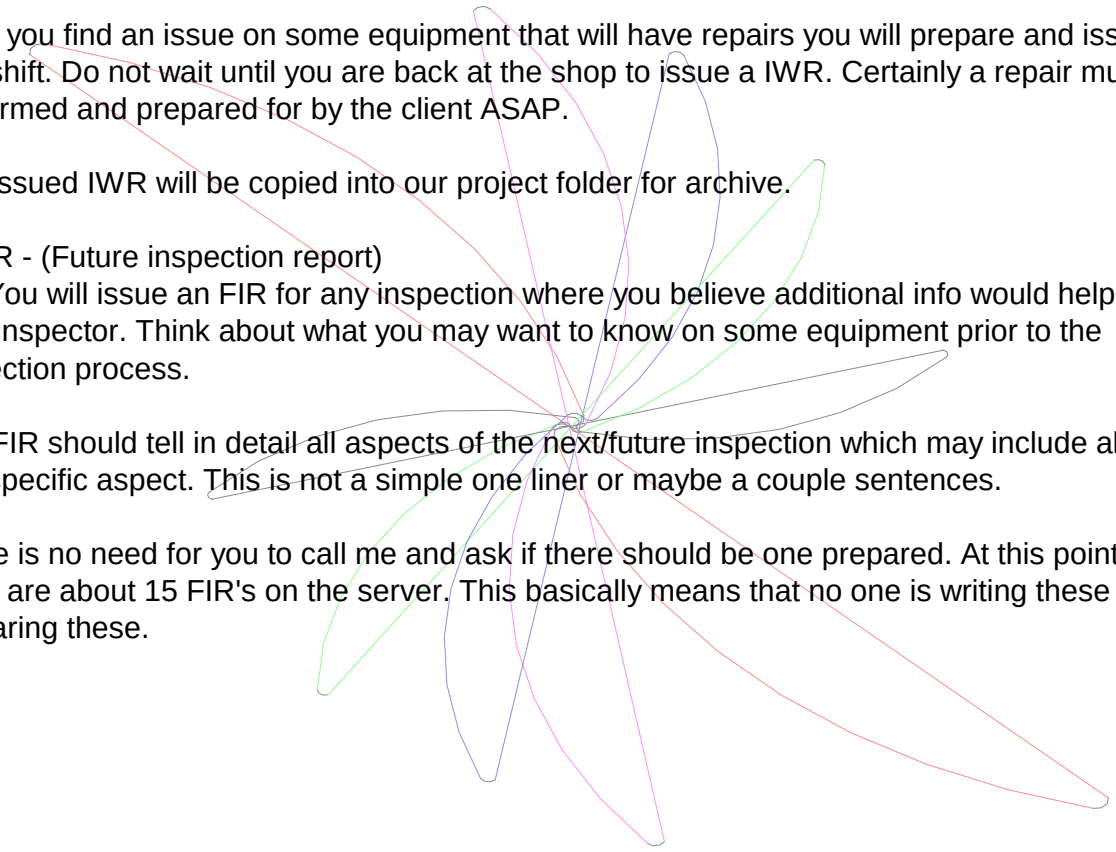
So, if you find an issue on some equipment that will have repairs you will prepare and issue that shift. Do not wait until you are back at the shop to issue a IWR. Certainly a repair must be performed and prepared for by the client ASAP.

The issued IWR will be copied into our project folder for archive.

2) FIR - (Future inspection report)
We/You will issue an FIR for any inspection where you believe additional info would help the next inspector. Think about what you may want to know on some equipment prior to the inspection process.

The FIR should tell in detail all aspects of the next/future inspection which may include almost any specific aspect. This is not a simple one liner or maybe a couple sentences.

There is no need for you to call me and ask if there should be one prepared. At this point there are about 15 FIR's on the server. This basically means that no one is writing these or preparing these.



# Reports, Locations and Drawings on Final Reports

You may have recently noted a few emails from me with regard to defect locations.

It is important for all personnel actually doing inspections, preparing documents, files, and populating the manila folders that our DC staff may not know what you are really reporting with regard to the defect locations. If you are not completely articulate in the defect locations the front office may not understand the entered locations and may issue a supplemental report with wrong location numbers.

If you pull the .CSV from MD500 and have not assigned defect locations with the "report defect" properly set the defect locations may default to some number.

How would the DC personnel know the numbers are correct, not correct, not added, etc..

THEY WONT.

Any report you create needs to be fully reviewed by you for content and context. This means you need to read the report. You need to read it for correctness, completeness, context, content, wording, punctuation, etc..

ALL DEFECTS HAVE LOCATIONS.

---

along the same lines here.

When filling out the filed report there are small pictorial drawings of exchangers, finfans. These are to be filled in by putting squares, blocks, arrows, pointers, etc.. on the drawing representing corrosion, damages, etc..

Now, simply putting a line and saying:

Corrosion

Clearly is not the intent of these drawings. You need to put some signatory item (square, polygon, block, circle, balloon, arrow, pointer)
which shows locations of corrosion and/or damages.

You need to also put verbiage - Again the term CORROSION would be very poor as a description. Consider the following:

The area covered in the circle is O.D. pitting corrosion which extends from the 4th to the 7th support.

In addition to your defect locations in the .CSV the pictorial will help the DC in defect locations if there is a question.

You may assume that every line, every statement, every pictorial in our field reports are there for a reason.

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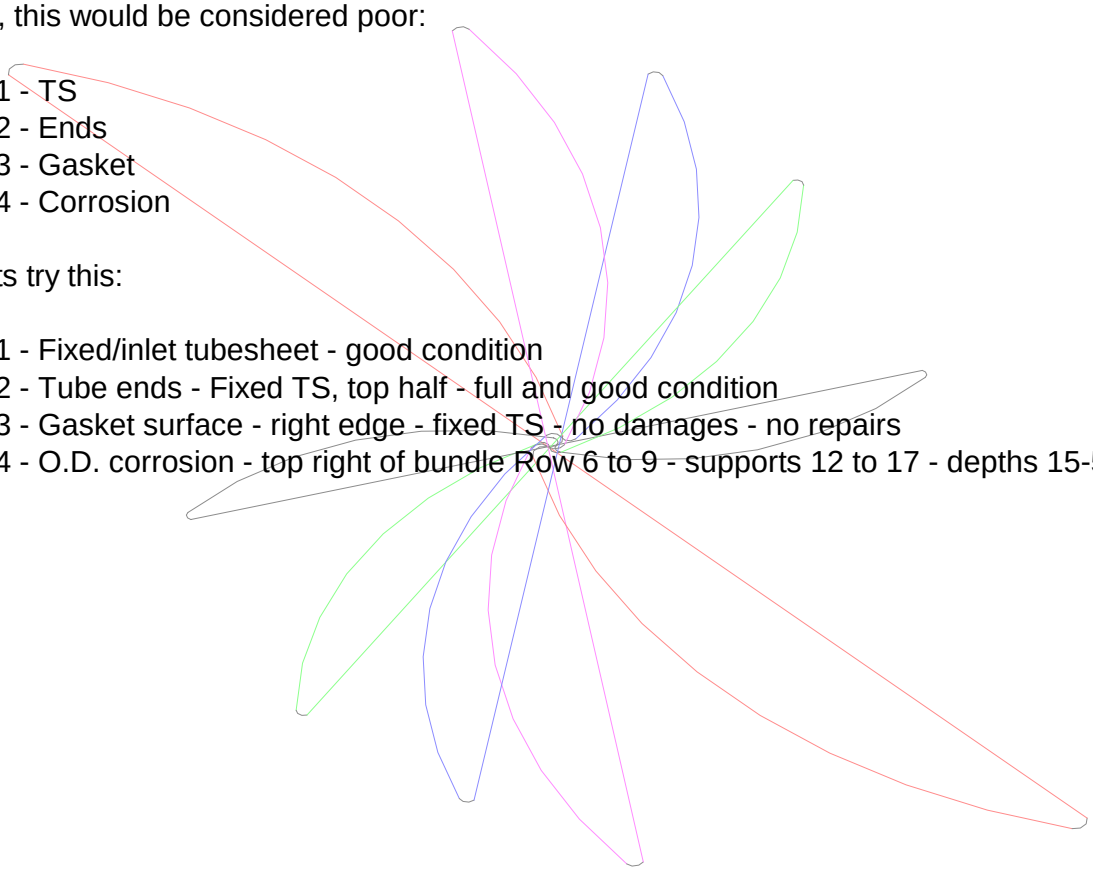
Finally, the description box provided on the field report for photos need to be fully filled.

So, this would be considered poor:

001 - TS
002 - Ends
003 - Gasket
004 - Corrosion



Lets try this:

001 - Fixed/inlet tubesheet - good condition
002 - Tube ends - Fixed TS, top half - full and good condition
003 - Gasket surface - right edge - fixed TS - no damages - no repairs
004 - O.D. corrosion - top right of bundle Row 6 to 9 - supports 12 to 17 - depths 15-55%.

# Post Inspection Document

**The following is a fictitious scenario to aid in documentation of changes, differences, additions, etc. that may occur post-inspection. Many other scenarios are possible in which an original inspection has additional information that needs to be correctly integrated into the report process.**

Scenario:

You're at MPLA for a job and you have completed the visual and ECT inspection for the bundle 1234E0001. The field report is written, the electronic files are completed, and you are about to start typing up the summary. Since you have green tagged this bundle, it is being loaded for removal from the bundle bad. As you are in your truck typing away, you hear the bundle fall off of the loader and miraculously, only one tube was severely damaged.

Now what?

There are a series of questions that should run through your head with the first one being 'What do I do now?'

You now need to go visually reassess the bundle to ensure that there was, in fact, only one tube damaged. You have rectified this information and determined that the severely mechanical damage has deemed it necessary to install a plug.

From here, take the following steps for documentation of the mechanical damage and plug recommendation:

1) Take sufficient photos of the damage. Minimum photos required are:
a. Fixed tubesheet photo with red paint markings indicating the plug
b. Photos of the mechanical damage
c. Full bundle profile with mechanical damage

2) Properly place a red tag on the bundle with all necessary information

3) Inform plant contact and bundle pad operator

4) Fill out R&R form, MII repair log, or other form that we/the plant may need

5) Update Hx form indicating that a plug was recommended

6) Make notes, corrections, additions to Field Report (See Plug Installation Field Copy Changes.pdf)

7) Update *.csv, *.ts, *.jpg

8) Create a Plug Map *.jpg

9) Include this information in summary. Ensure that there is ample explanation and reasoning for having an ECT inspection done for this tube (assuming that it was in the inspection pattern) even though it would be clearly inaccessible for testing. Also make sure to explain the timeline in which this M/D happen – as in it happened after you were done with everything.

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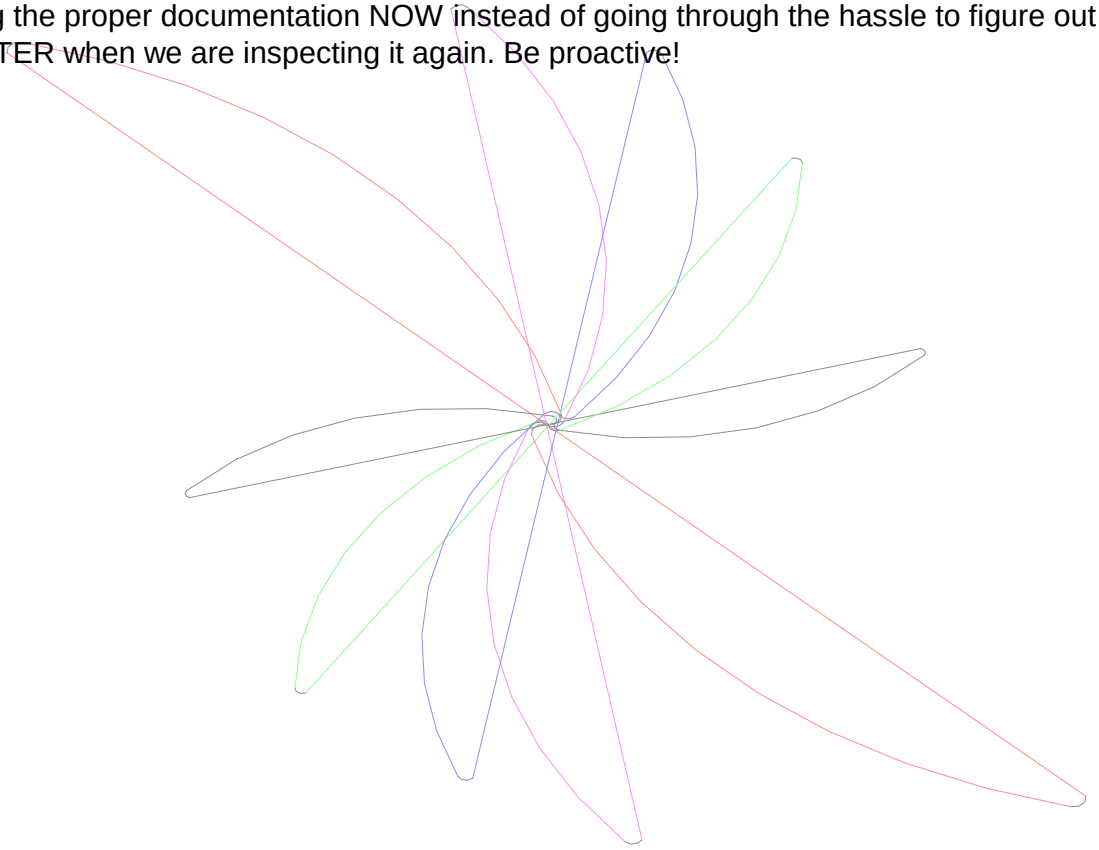


# 50% Rule

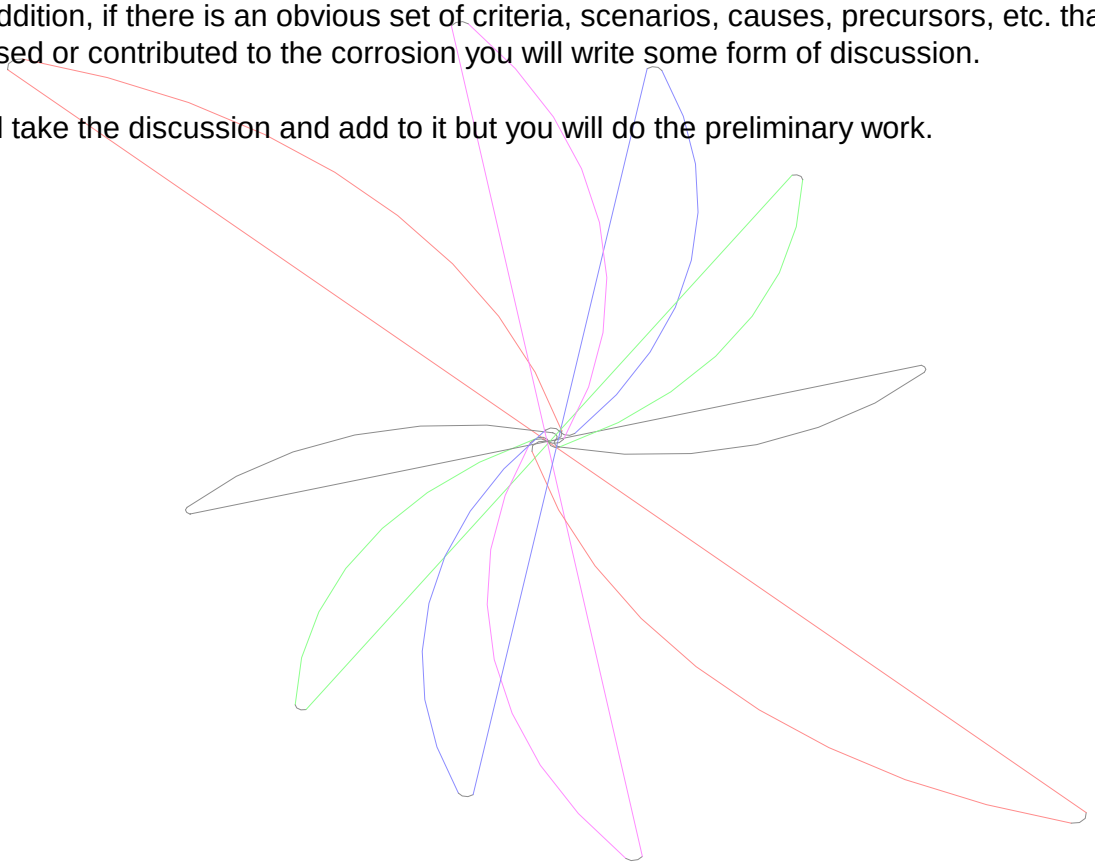
As you all know we have a "50%" rule which we all understand. If you do not understand let me know.

If you test an exchanger with 50% wall loss or greater, you will need to make a 3D drawing with the correct locations. This would certainly mean all correct supports, spacing, types, etc.

If you are not an expert at this drawing type may I suggest practice?

In addition, if there is an obvious set of criteria, scenarios, causes, precursors, etc. that have caused or contributed to the corrosion you will write some form of discussion.

I will take the discussion and add to it but you will do the preliminary work.

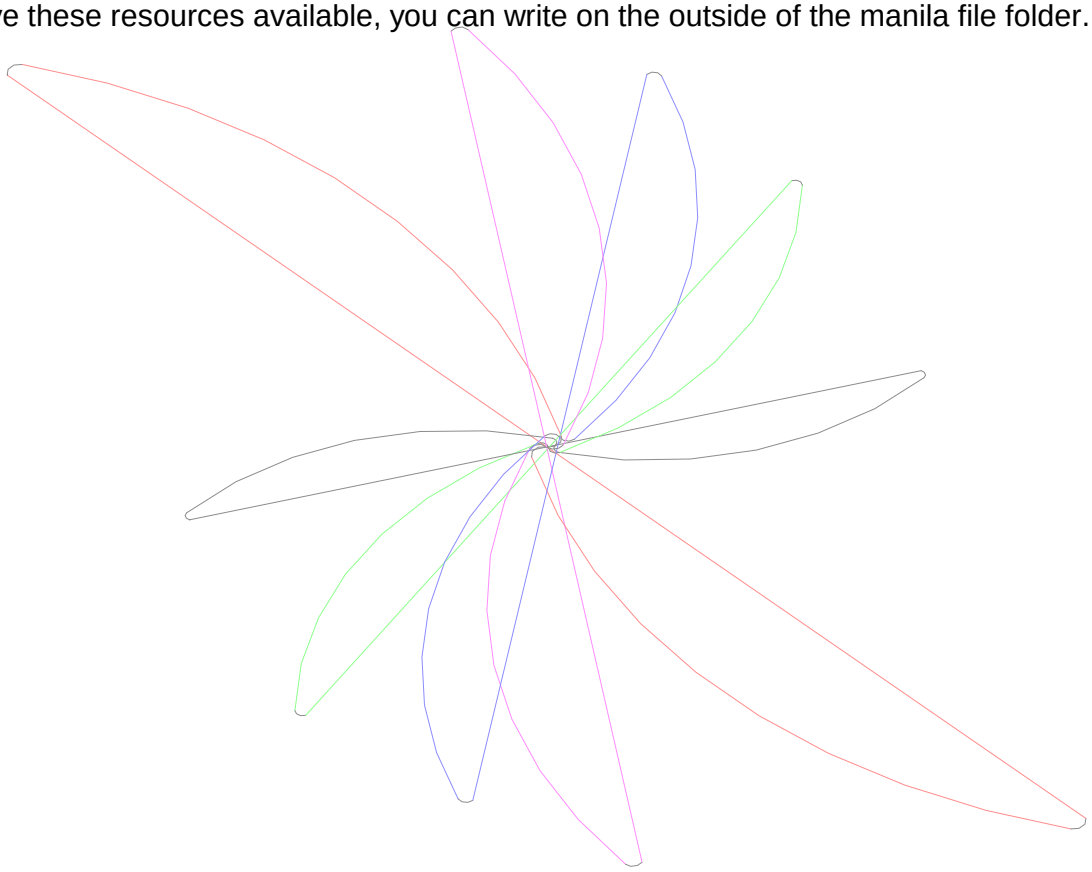


# Turning in Jobs to Data Central

If you are turning in a job to the DC and someone else has additional files for that job, PLEASE make a note that includes the following:

Who has the remaining files
How many additional files there are

It takes 5-10 seconds to add a sticky note or piece of paper inside a file folder. If you do not have these resources available, you can write on the outside of the manila file folder.



# Returning from a Job

Data Central is to receive the following items:

Job Folders
All electronic files
Hard Drives/G Sticks
Edata
File Boxes

The bookkeeper is to receive:
Signed Timesheets
Green Bars
Time cards for temps
Hotel bills
Receipts for rentals, catered meals, special safety equipment or tools that are job specific

THE BOOKKEEPER IS NOT PART OF DATA CENTRAL SO DO NOT ASSUME THAT SHE WILL GET THE ITEMS I NEED IF YOU PUT THEM IN DATA CENTRAL'S INBOX

From this point forward all returning equipment to the shop that is organized in a pile will have a sheet giving information to the client and job#.

This should read as follows:

ABCD
001-14

Do not simply leave any equipment or probes in piles.

# Inspections / Jobsite

When you come on site, the lead inspector needs to let the client contact know that Magnetec is on site.

As an inspector with this company your equipment, vehicles, etc. will be available for inspection.

You will follow the following procedure when you enter a plant.

Upon entering a plant you will take 10 min to prepare your vehicle for the days inspection. This would include the following.

1) Clean as required from the previous day. Remove trash, clean desks,etc.
2) Prepare and probes that may be expected for the days inspection.
3) Confirm that your inspection equipment is ready for work. Check red wire and head phones.
4) Charge all batteries required for the job. There will be no more uncharged batteries.
5) From work scope, HX or shift turnover the days work scope. Discuss with other inspectors and prepare for your inspections of the day.
6) Monitor your vehicles condition for required gas, air in tires, system battery, etc.
7) Restock as required. Tape, paper towels, cleaners, etc.

Your vehicle is your/our mobile office and will be used as such.

Your equipment is expected to be fully functioning for our inspections or was previously called out for repair or failed as you plugged it in that morning. You will be required to have a working system or had previously brought to attention the non-working status. We will no longer tolerate - It is not working, it stopped working on the last job. I had better know of this.

You are to have working flashlights, replacement batteries, etc.

At the end of the day you should perform a reverse function of the days start.

Report personnel: You are to perform the same functions. Your equipment may be different but still has to be available.

# Job Requirements

If you are on a job site you are expected to pull your share of tubes.

If there are 2 people and 1000 tubes your amount = 500
If there are 3 people and 1000 tubes your amount = 333

This would be true in all cases and all situations. Please monitor the daily activities and rotation of pullers for your turn.

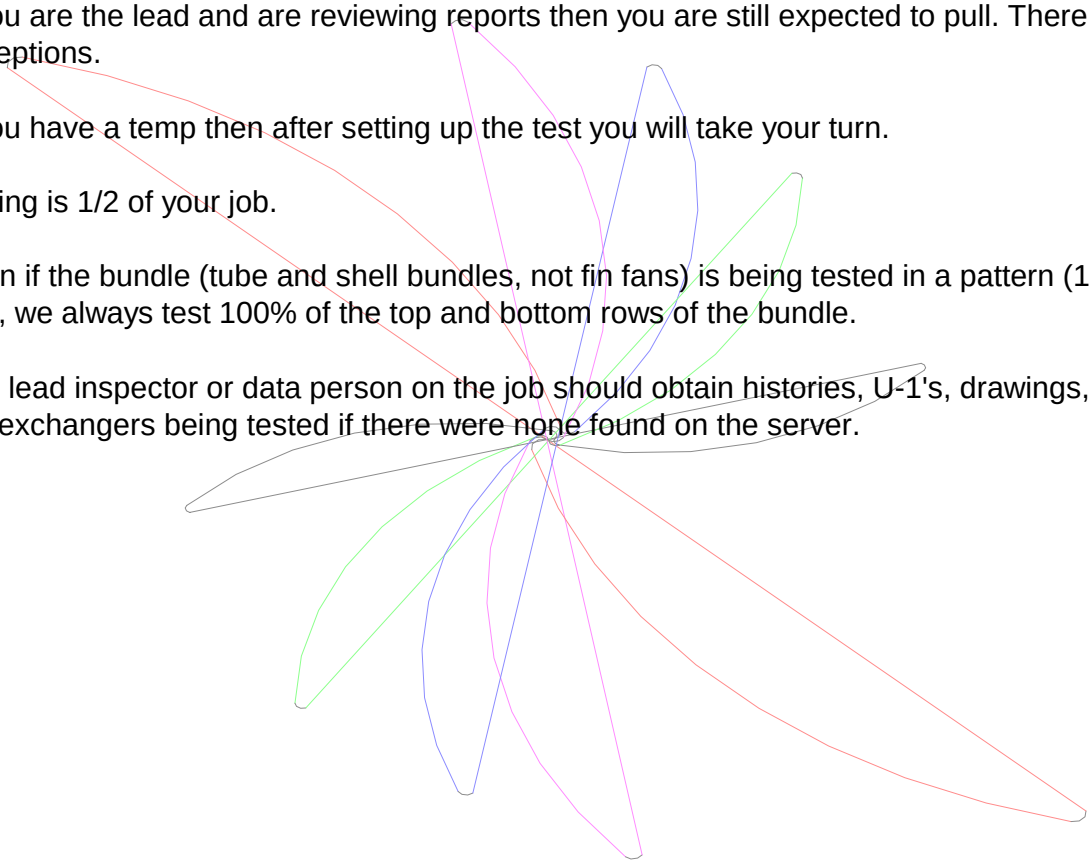
If you are the lead and are reviewing reports then you are still expected to pull. There are no exceptions.

If you have a temp then after setting up the test you will take your turn.

Pulling is 1/2 of your job.

Even if the bundle (tube and shell bundles, not fin fans) is being tested in a pattern (1, 5, 10, ect), we always test 100% of the top and bottom rows of the bundle.

The lead inspector or data person on the job should obtain histories, U-1's, drawings, etc. for the exchangers being tested if there were none found on the server.



# Hotels

On large jobs, hotel rooms will be arranged by the DC.

Small jobs, you may be required to make your own reservation.

You are expected to stay where the reservation has been made.

You may not check out and go to another hotel unless approval is given by Ethan Williams.

You must get a hotel receipt when you check out of your hotel room. This receipt must be sent to the book keeper.

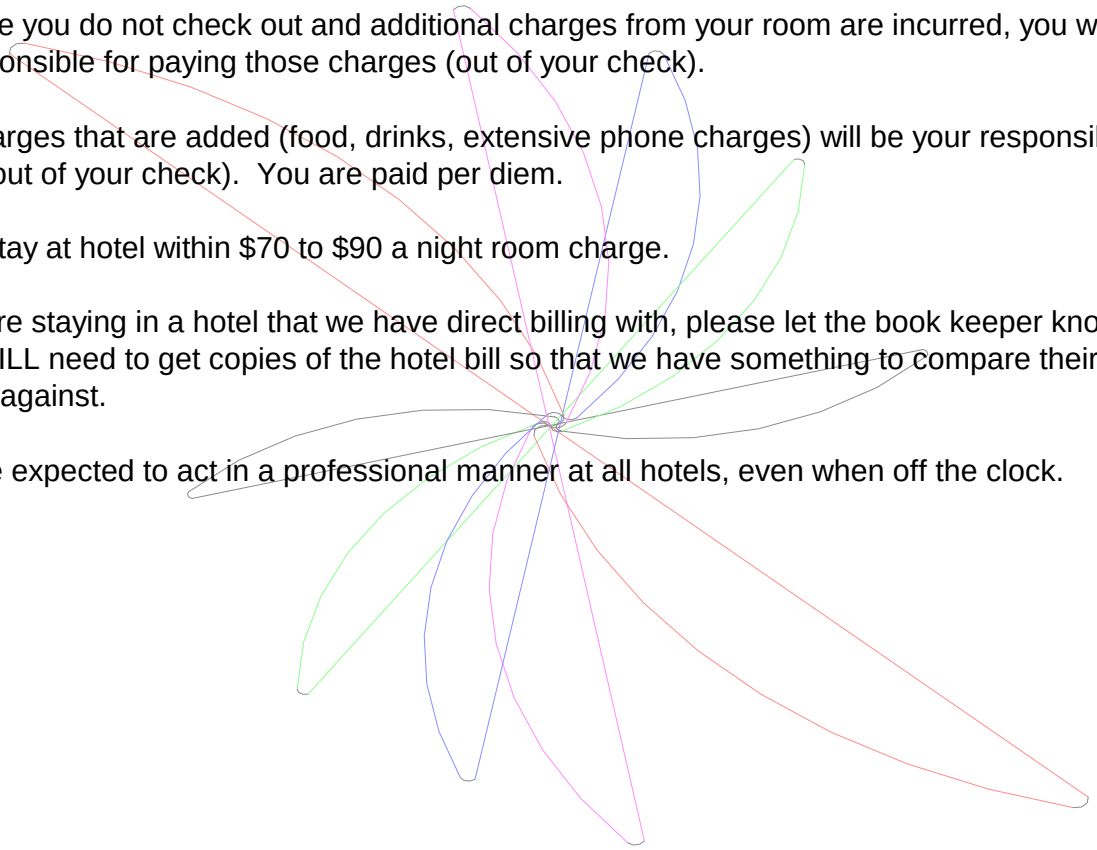
Any time you do not check out and additional charges from your room are incurred, you will be responsible for paying those charges (out of your check).

Any charges that are added (food, drinks, extensive phone charges) will be your responsibility (taken out of your check). You are paid per diem.

Try to stay at hotel within $70 to $90 a night room charge.

If you are staying in a hotel that we have direct billing with, please let the book keeper know. You STILL need to get copies of the hotel bill so that we have something to compare their invoice against.

You are expected to act in a professional manner at all hotels, even when off the clock.



# Client Specific Info

Stepan Company

The bundle number, asset number and National Board number should be on every report. Ex. 411404, E461.2, NB 5647

MPOH
Due to recent changes in the billing system at MPOH the following are guidelines for jobs performed at that site.

1) On any day that you are on-site you will be in the gate for 8 hours. If you complete the inspections early you will need to be there on-site for 8 hours as previously mentioned unless discussed with Ethan on timing.

So, an inspection will take all day. There is no reason to rush anything.

This condition will not ever change unless directed by me either verbally or by email.

2) You will complete all reports on-site as part of the scheduling. You can assume that you will video on-site on every job and prepare a video for the plant. If you are not versed in the windows movie maker program please prepare some time to get versed.

Again: If you are not versed in the windows movie maker program please prepare some time to get versed.

So, This would imply, if you (insert your name here) have never created a movie you (insert your name here again) must sit down and create a movie. DO NOT CALL AND TELL ETHAN YOU DO NOT KNOW THIS PROCESS AS YOU HAVE BEEN DIRECTED HERE TO BECOME VERSED.

3) All jobs there are T&M so you will need to be active in the work allocation and green bar system. Our intent is to have this being completed by the DC, however you must be apart which means you may have to contact the shop and give hours to that person (e.g. Angie).

MPKY

MPKY names there files with extra zeros. For example if the bundle is 1-4-E-25 it would look like MPKY_1004E0025_08_03MAR

The first number is as is, then there should be 3 additional numbers before the E (4 total counting the first number), after the E should be 4 additional numbers

If the bundle is 1-103-E-5 it would look like 1103E0005 and for us it would be MPKY_1103E0005_08_10OCT
If the bundle is 2-35-E-103A it would look like 2035E0103a and for us it would be MPKY_2035E0103a_08_11NOV

IRVTX

Lock out/Tag out Procedure
The authorized employee will place employee locks and tags at disconnect points, multiple lockout devices, and/or lockbox's when equipment to be worked is ready for Magnetec employees. The use of a lock (Individually keyed/red color) and tag system will effectively prevent an accidental start-up and/or release of energy. Each lock must have an Invista supplied green information tag affixed with the lock. The tags will identify the employee/owner of the lock and additional information as listed below. The lock and tag will not be removed without authorization, disregarded, bypassed, or reused by any employee.

1. The authorized employee will enter the following information on the tag:
a) Name of the worker who placed the tag;
b) Date/time work began;
c) Nature of work being performed; and
d) Contact Information.

Locks and tags must be placed prior to commencing any work that requires energy control.

Group Tag out
When servicing and/or maintenance is performed by a crew, craft, department or other group, they will utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lock out or Tag out device. Group Lock out or Tag out devices will be used in accordance with the following specific requirements.

1. An authorized employee is vested with primary responsibility to use a group tag out device. This authorized employee will be either the foreman or supervisor. The foreman or supervisor will be active in the permit process and JSA/JHA review process. After completion of valid work permit(s) and briefing of workers with work scope, hazard, and JSA/JHA all affected employees will place their individual locks and tags. A group tag will then be placed to identify the work group. The group tag will be placed at the top of the lockout device chain.

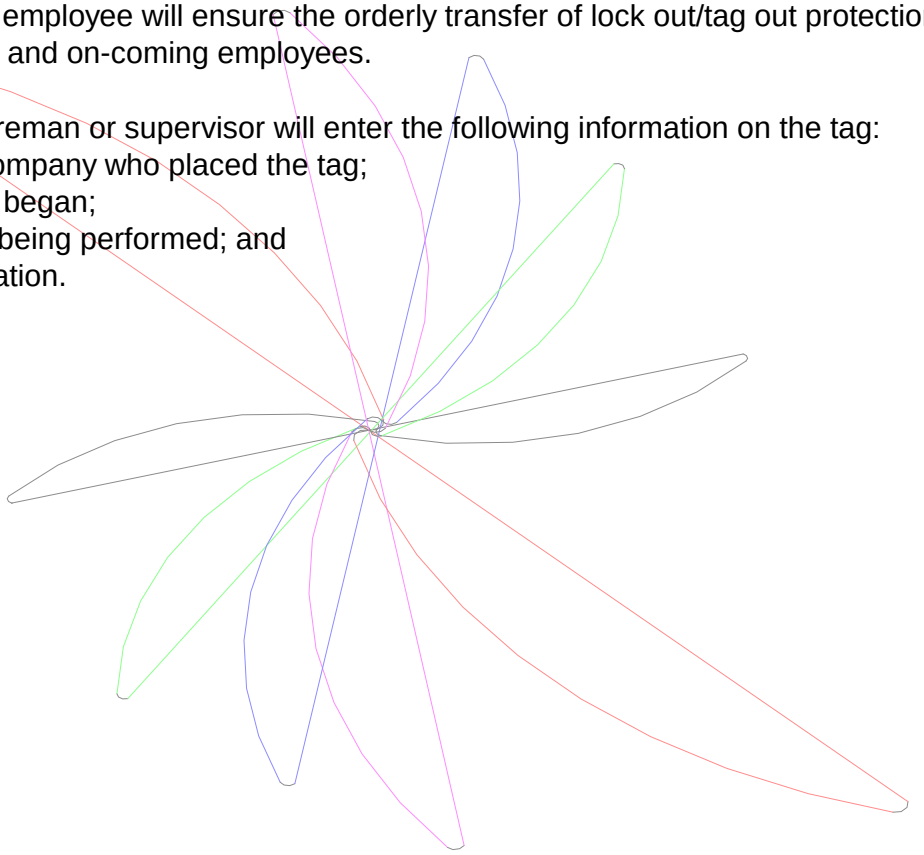
2. The authorized employee must verify group members exposed be locked and tagged prior to any work.

3. When more than one crew, craft, department, etc. is involved, an authorized employee will have overall lock out/tag out control responsibility to ensure continuity of protection.

4. The authorized employee will insure all lock out/tag out devices are removed at the end of the work scope, end of shift, or when equipment is returned to plant control.

5. The authorized employee will ensure the orderly transfer of lock out/tag out protection between off-going and on-coming employees.

The authorized foreman or supervisor will enter the following information on the tag:
a) Name of the Company who placed the tag;
b) Date/time work began;
c) Nature of work being performed; and
d) Contact Information.



# Timesheets / T&Ms and Firm Bid

1) You must get time sheets signed by the customer if it is a time and material job. Make sure all information is on sheet.
2) We must have a PO# on the sheet. Ask for one if you do not know the number. Make sure tubes tested is on the sheet and/or add the HX form for reference.
3) The timesheets and hotel receipts need to come to the bookkeeper as a package. Make a manila folder and insert the timesheets and all hotel receipts. If you are not the job lead and did not have timesheets signed however you did get hotel receipts you must get them to the job lead for the manila package. Tracking down missing info, timesheets, signatures, receipts, tubes tested, etc. put a delay in getting the invoicing done.

There are two types of job charges to our clients.

1) Firm Bid - This type of charge is predetermined. Day forms are needed and time sheets (unsigned) are required.

2) Time and Material - This type of charge requires signed time sheets and day forms.

These should be in the manila folder and on time sheet.

Time sheet with all info. - Date, job number, PO# (Please ask for it on job site), Personnel, employees, hours, exchangers tested with total tubes, per diem, mileage.
If these are not on time sheet we can not bill for them.
It is your responsibility to get a signed copy from the client. (Can have faxed)

Hotel receipts for the job must be turned in as well.

An HX form with the listing of the exchangers and total tubes tested this should also be in the folder.

In all cases you can have T&M and receipts sent to the E-Fax number (815)364-2597.

All receipts are to be turned in weekly.

On all Firm Bid or T&M jobs you must get a signed Time Sheet (OURS) for all standby, on call or any changes made to the original inspection.
Please remember the plant does not necessarily tell their accounting departments of changes, when these occur we have no proof of your time, therefore we cannot get paid for your additional work.

NEVER leave the plant WITHOUT THE SIGNED TIME SHEETS FOR YOUR STANDBY, ON CALL OR ADDITIONAL WORK  make sure that you put on the time sheet what we are charging for ie.... standby, on call or if its additional work!!!
As always contact Ethan when changes occur and email the bookkeeper that you have additions, standby or whatever this allows me to get all accounting people on page prior to the invoice going out.

We get paid for our travel time.

If you are on a T&M job you will always need to get time sheet for our travel.

If you are the lead person you are responsible for the entries on the time sheets.

You can assume that you will get signed time sheets for all travel. This includes firm bid.

Below is an attempt to explain our travel related charges and circumstances where we will want to get time sheets signed:

1) (T&M) Time and Material.
This classification of charges is one of the oldest in the industry. It basically assumes that there will be a confirmation sheet (T&M) of charges which lists personnel times and material charges to the job. This sheet is generated either daily or at end of the job for the client to sign. It is the signed copy which acknowledges the time sheet specifics from the client. It is these time sheets that go to the bookkeeper that we utilize for billing purposes. If there is a line item that is not on the time sheet then we do not get paid for it.
All time involved with reference to a job needs to be listed on the time sheets so we can bill for it. This would certainly include travel related times and charges. A time sheet will always be required for time spent behind the wheel.
e.g.. Day one travel to FHRMN, Day two work at FHRMN, Day three travel back to shop = 3 days charges (2 travel and 1 work)

Travel also includes travel to/from local job sites (eg. FHRIL). We bill from portal to portal - which means from when you leave the shop to when you arrive back to the shop.

See #3 with regard to mob/demob. These clients will need to have time sheets for our travel even though we offer a flat rate charge.

2) Firm Bid
This classification is utilized on jobs where all costs related to the job are totaled and lumped into a final cost. This would include but is not limited to travel, personnel, equipment, probes, P/D, hotel, gas, etc.
This situation should be reviewed on a job to job basis whether if there is any indication the accounting department will hold up our invoice due to travel related questions then we should get a signed time sheet. There is almost no way of knowing when this will occur and is more based on certain clients. The general response is if in question then get a signed time sheet or call and ask.

You need to fill out either a time sheet and a day form for every day you are performing a job.

So; assumably you will have the following for a job where you tested one bundle.

1 Field/Final
1 HX
1 Timesheet

We must have green bars and time sheets for all jobs at Marathon locations no matter if its firm bid or T&M.
Any other client the bookkeeper must have a time sheet. Firm Bid, T&M it does not matter you must send this information.

Please do not sign any CSM's or anything else close to it. You may sign time sheets and green bars if you are the lead inspectors anything else must come through the corporate office and be signed by Ethan.

When you are sent to a client's location you must badge in and stay for 8 hours. You cannot leave the plant for that time frame unless you are directed by Ethan to do so. If Ethan directs you to leave you must put that on your day form so we know that he authorized it.

The intention of the time sheets is for us to have a signed record of the daily activities from our client.

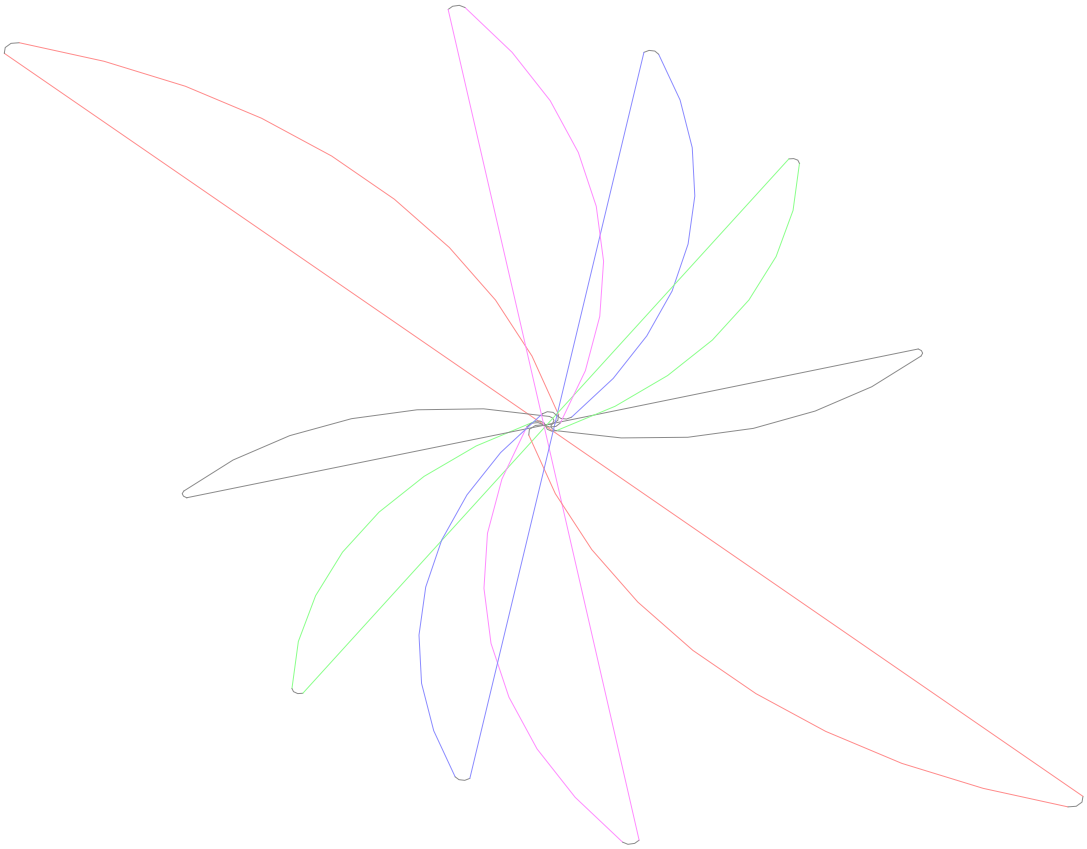
You will always have to keep track of the time sheets. If you go on a job you will prepare, forward, and send to the bookkeeper. You will keep track of the Time Sheets for your job.

You will need to get signed time sheets for standby.

TIMESHEETS

It does not matter if a job is firm bid you must send in  time sheets.  If the job is FIRM BID the time sheets DO NOT have to be signed.
All Marathon jobs must have green bars/green sheets sent in.  This is part of your responsibility to complete your paperwork.

DO NOT call and ask Ethan - our policy is everyone turns this paperwork in REGARDLESS if its FIRM BID or T&M.



# Temporary Workers

If your using a temp service, Jennifer and Michelle need to know what job they are on and the temp workers names.

Only company personnel will ride in vehicles when we are not in plant.

Due to insurance constraints and the world of law suits if you were to be giving a non-employee a ride somewhere and get into a car accident there would be a law suit against Magnetec.

We can not allow temps, non-employees, family members, friends, etc to ride in company vehicles.

Please take appropriate action to follow these directions.

We will have to loan company equipment to the temps like hard hats, FRC, H2S monitors, etc. We need to make sure we collect the equipment at the end of the job. For the harnesses, H2S and four gas monitors, those need to be collected at the end of each shift.

Do not discuss any payroll info with the temps. Direct them to talk to their rep at the temp company (example: April from LK Jordan).

Do not discuss per diem with the temps.

Do not discuss your salary with the temps.

Do not discuss paid holidays with the temps or any shift differential pay. These questions should all be directed to their temp company rep.

If a temp is done on the job site for the job, contact Michelle and Jennifer to let them know the name of the temp.

# Social Media

When you are on a job site, you will not post anything about the job site on any social media site (facebook, instagram, tik tok, twitter, etc.).

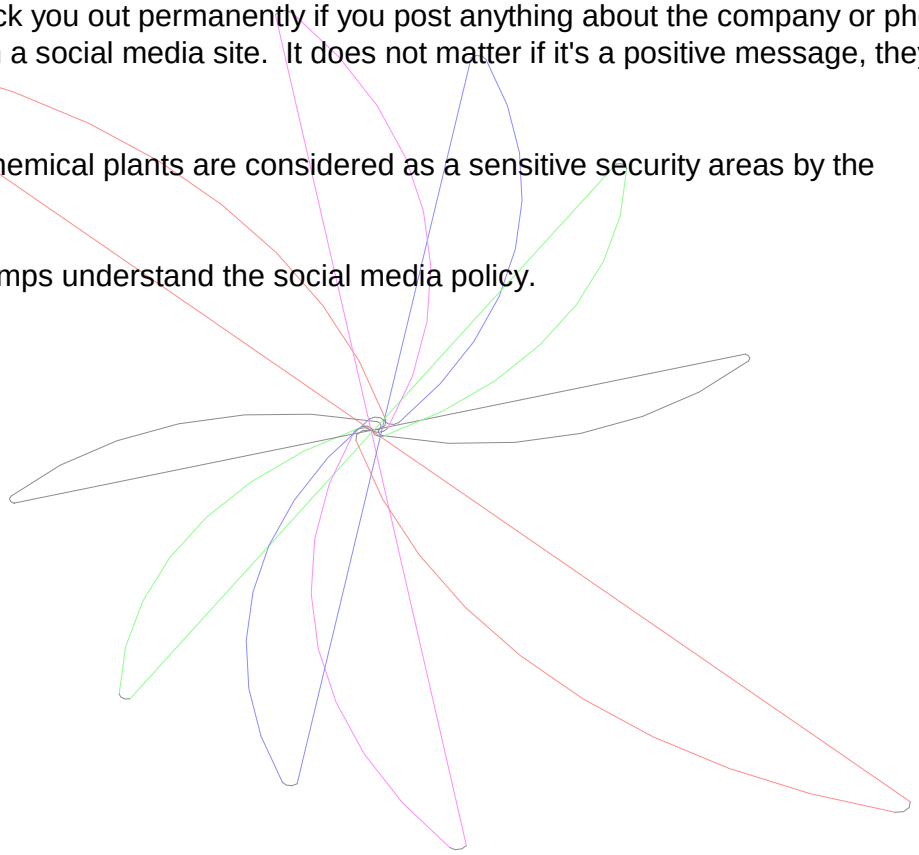
Do not tag your location at the plant ever.

Do not take any pictures or selfies with your phone inside or outside with the plant and post to social media.

The plants will kick you out permanently if you post anything about the company or photos of their company on a social media site.  It does not matter if it's a positive message, they do not allow it.

Refineries and chemical plants are considered as a sensitive security areas by the government.

Make sure the temps understand the social media policy.



# HX Form

The HX form is the only concise document which tracks and has all information with regard to what was inspected on a particular job

You must complete an HX form for every job. All lines must be filled out with correct appropriate info.

If you are the inspector and fill out a line on the job then you own the line.
It is your direct responsibility to complete the line as fully as possible.

If you are the report writer/secretary on a job then it is also your direct responsibility to make sure the HX is fully completed and forwarded to the client. Even if you leave a job early you must keep in contact with the last inspector on the job to insure that the HX is complete and forwarded to the client. This will probably require calls to the inspector to gather information and/or to get confirmation that the HX is complete and is sent.

If you are the inspector on the job it is your responsibility to complete the HX and forward to the client and the report writer so they are on the same page.

There will always be someone in charge of the HX. If as the report writer you leave the job early and give/pass the HX to the inspector then he now has ownership of the HX and it's contents. You still need to keep in contact with regard to completion and should be getting daily updates - WHY - Because the inspection would have added you to the E-mail list.

If the report writer keeps the HX form (Say only one day of inspection left) and they leave town headed home then they keep ownership and will add the inspector to the E-mail distribution list. You as the inspector will then get an E-mail of the HX. The inspector would be sending info to the report writer every day.

Remember the HX form must be transferred to the exchanger info tab on the job tracking form comment box.

We can not loose track of the job. The end of a large job at the specific plant site is not the end of the job. It is the end of Data collection. There is an equal and opposite job that begins at the shop to complete the inspection reports, de-mob equip, etc..

Understand that the girls in Data Central have no idea of the job, what was tested, when, what the bundle looked like, what we found, etc. - it is with reference documents such as the HX form and specific report folders that they can use to build a job from their perspective.

When completing a HX (either on-going or at job end) you will need to adjust the page.

Only HX specific line items should be shown. Do not send out pages of open lined boxes.

So, a 20 bundle job should have 20 lines of information.

# Edata & MD500

We have come a long way with the MD500 software package.

This package allows many options with regard to collecting data, analysis, data manipulation, review, storage, filtering, file referencing, etc.

We need to make sure the following is completed for the Edata.

For any job you are on, Edata is collected. There should be a CD made or stick/hard drive returned to the shop to the DC with the Edata.

The CD/stick should only have the Edata and not all the folders that go with the report disk. (eg. Summary, .TS, .CSV, .JPG, Photos, etc.)
This should be a separate disk/stick.

Assumably there will be Two cd's, sticks, hard drives turned in for every job. (Reports and Edata)

The cds/sticks/hard drives should have Job specifics on them. (eg. 001-09_FHRWTX_09_01JAN_Reports or Edata)
These should be turned in with the job folders into the "IN BOX"

For long recurring jobs the Edata CD's should be made every week so if a machine crashes the data is still there. (MPKY - Bundle Cleaning Program)

Remember if you send Edata over the NET as E-mail you need to attach the .EPRJ and Config file.
(The config file has the little gear on it) Without these you can not open a project and each file needs to opened by itself. (A big hassle)
Without the Config, the person on the other end has no reference as to your setup.
Also include any Calibrations and/or leaking, badly corroded files.

IF YOU DO NOT KNOW WHAT THIS IS OR HOW TO DO THIS ASK.

Prior to any new scope working on your machines there must be a driver written for the specific USB device. If you start a machine and the new hardware dialogue box pops up then you will need to have a driver written and installed. This is taken care of by the USB device, other than you pointing to the directory that had the driver maker.

When you start the MD500 software there should be a little yellow box in the upper left of the screen that will give a firmware version. There must be a number here. This essentially tests the USB and returns the firmware number.

License and Registration process:

There is a two stage sequence for this process -

1) License - There is a license generated for your machine which correlates certain information of your machine and generates a 64 hexadecimal code to unlock your machine. This only has to be done once at the original installation of the software. This is done for you by Ethan. Think of this like buying your home - you only have to buy it once.

This is where the confusion is.
2) There is an unlock key that is generated once a year and periodically installed on your machine through the install packages you get by E-mail. The key will unlock your machine for 3 months or 4 time a year (once a quarter). Without this key your machine will not run. If the expiration date of the key has passed, the machine will generate a message which states that your license has expired. (It is not really the license only the key that has expired). You must install and run the software updates on all your machines and run, to have the keys installed on your machines. You do not need intervention on this matter only load and run your install programs. Using the home reference above, you may have bought the house but you need a key to open the door and this key changes every 3 months.

We will always attempt to record Edata for every inspection we perform.

This would include if you are either testing alone or as a separated crew each testing an individual Hx.

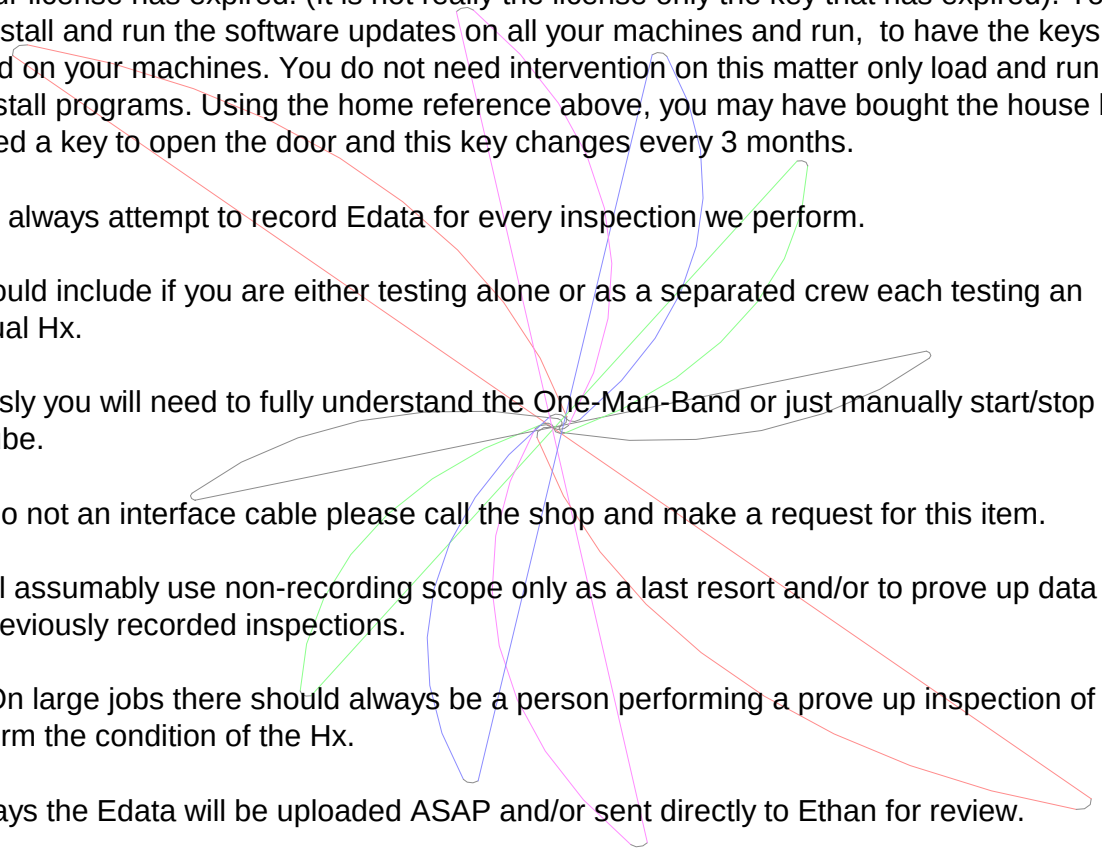
Obviously you will need to fully understand the One-Man-Band or just manually start/stop each tube.

If you do not an interface cable please call the shop and make a request for this item.

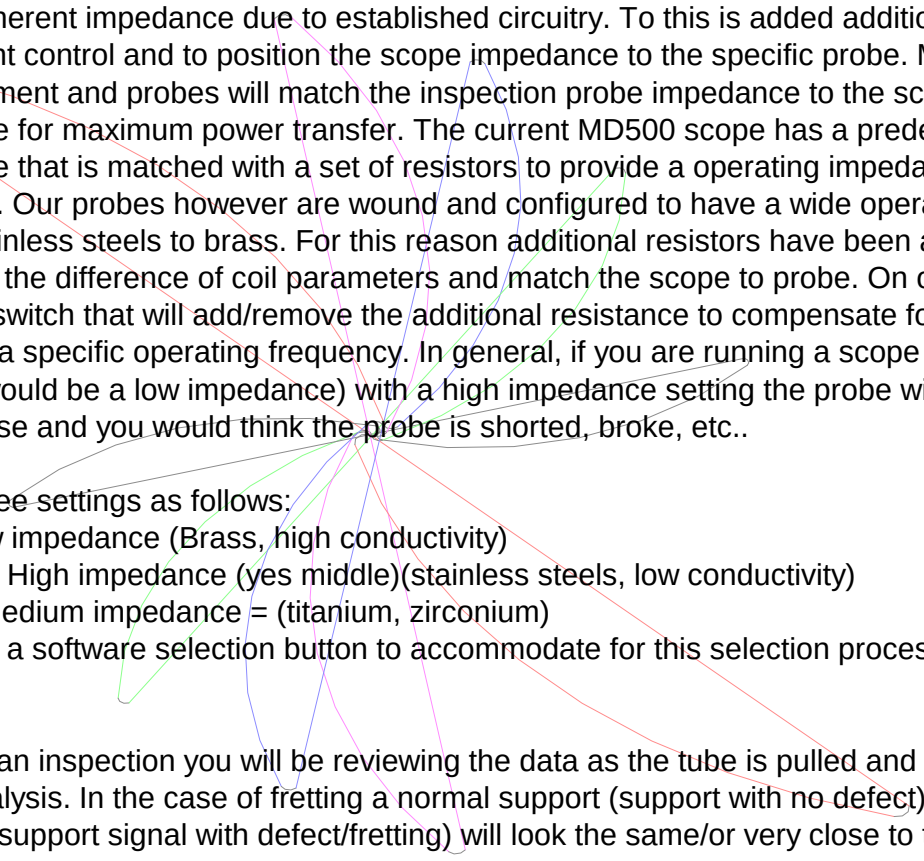
You will assumably use non-recording scope only as a last resort and/or to prove up data from previously recorded inspections.

Note: On large jobs there should always be a person performing a prove up inspection of Hx's to confirm the condition of the Hx.

As always the Edata will be uploaded ASAP and/or sent directly to Ethan for review.



Matching Impedances:
The term “impedance” refers to the total opposition to current flow in an ac circuit, and is measured in ohms.
A ECT probe consists of two coils that are magnetically joined because they are close to one another and because they are wound around the same magnetic/air core. The input signal (frequency) goes to the coil pair and the output signal (Impedance change) is sent to amplification. The transfer of voltage from the primary drive circuitry (scope) will be in proportion to the number of turns in the coil, inductance and drive frequency. The transfer of driving power to the coil is optimal when the drive impedance and coil inherent impedance are the same. If these two components are not similar then there is a poor transfer of power from the drive circuit to the coil resulting in poor response of the coil to changes in the tubing (defects). The major changing component of this system is the change in frequency over alloy changes. A quick review of ECT theory will state that low frequency's have low inherent impedances, high frequencies have high impedance. Most scopes as part of a completed design have an inherent impedance due to established circuitry. To this is added additional resistors for current control and to position the scope impedance to the specific probe. Most suppliers of equipment and probes will match the inspection probe impedance to the scope internal impedance for maximum power transfer. The current MD500 scope has a predefined internal impedance that is matched with a set of resistors to provide a operating impedance of approx. 470 ohms. Our probes however are wound and configured to have a wide operating range to cover stainless steels to brass. For this reason additional resistors have been added to compensate for the difference of coil parameters and match the scope to probe. On our scopes there is a switch that will add/remove the additional resistance to compensate for the coil impedance at a specific operating frequency. In general, if you are running a scope setup on brass tubing (would be a low impedance) with a high impedance setting the probe will not have good response and you would think the probe is shorted, broke, etc..



Our scope has three settings as follows:
Switch to left = low impedance (Brass, high conductivity)
Switch to middle = High impedance (yes middle)(stainless steels, low conductivity)
Switch to right = Medium impedance = (titanium, zirconium)
We will soon have a software selection button to accommodate for this selection process.

When performing an inspection you will be reviewing the data as the tube is pulled and after words through analysis. In the case of fretting a normal support (support with no defect) and distorted support (support signal with defect/fretting) will look the same/or very close to the same on the strips.

We know as you curse through the Edata in analysis and there are numerous supports within every tube you may not highlight every support if your review cursor is small and could/would probably miss the fretting.

You must be aware while inspecting and through the analysis process to confirm you catch these defects (if any)

Screen prints.

File ending _122751:
This tube has severe fretting depth at TSP #1 which is highlighted in the XY screen.

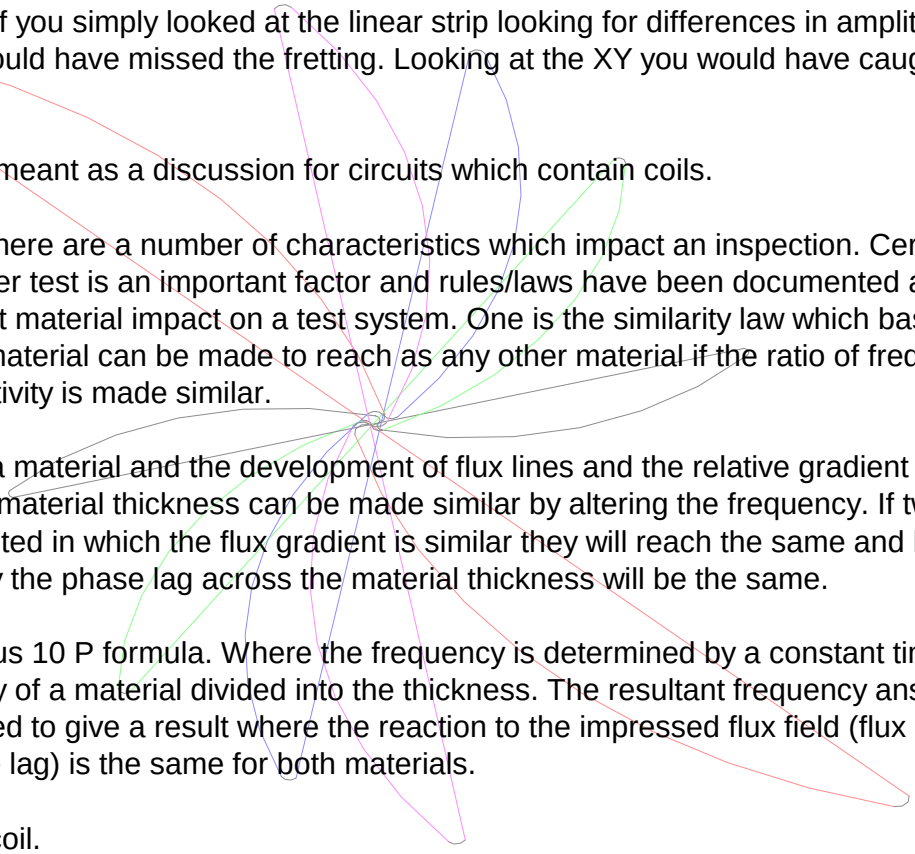
File ending_122759:
This tube has fretting at TSP #2 which is highlighted in the XY screen. This depth is much less than the previous screen.

File ending_122708:
This is a good support with no defect which is highlighted in the XY screen.

As you can see if you simply looked at the linear strip looking for differences in amplitude or signature you would have missed the fretting. Looking at the XY you would have caught the defect.

The following is meant as a discussion for circuits which contain coils.

As we all know there are a number of characteristics which impact an inspection. Certainly the material under test is an important factor and rules/laws have been documented and proposed for that material impact on a test system. One is the similarity law which basically states that any material can be made to reach as any other material if the ratio of frequency to inherent conductivity is made similar.



The reaction of a material and the development of flux lines and the relative gradient of flux lines across the material thickness can be made similar by altering the frequency. If two materials are tested in which the flux gradient is similar they will reach the same and based on the frequency the phase lag across the material thickness will be the same.

This is the famous 10 P formula. Where the frequency is determined by a constant times the relative resistivity of a material divided into the thickness. The resultant frequency answer then is normalized to give a result where the reaction to the impressed flux field (flux density, frequency phase lag) is the same for both materials.

OK now for the coil.

A coil - the thing that impress's the magnetic field into a part has it's own set of rules. Now my fingers are sore today from planting 1/2 a garden of plants and pulling a yard of weeds so no dissertation here.

A coil needs of course the appropriate circuitry to operate and certainly a housing to keep it safe amongst the harsh environments of tubes. It also needs food.

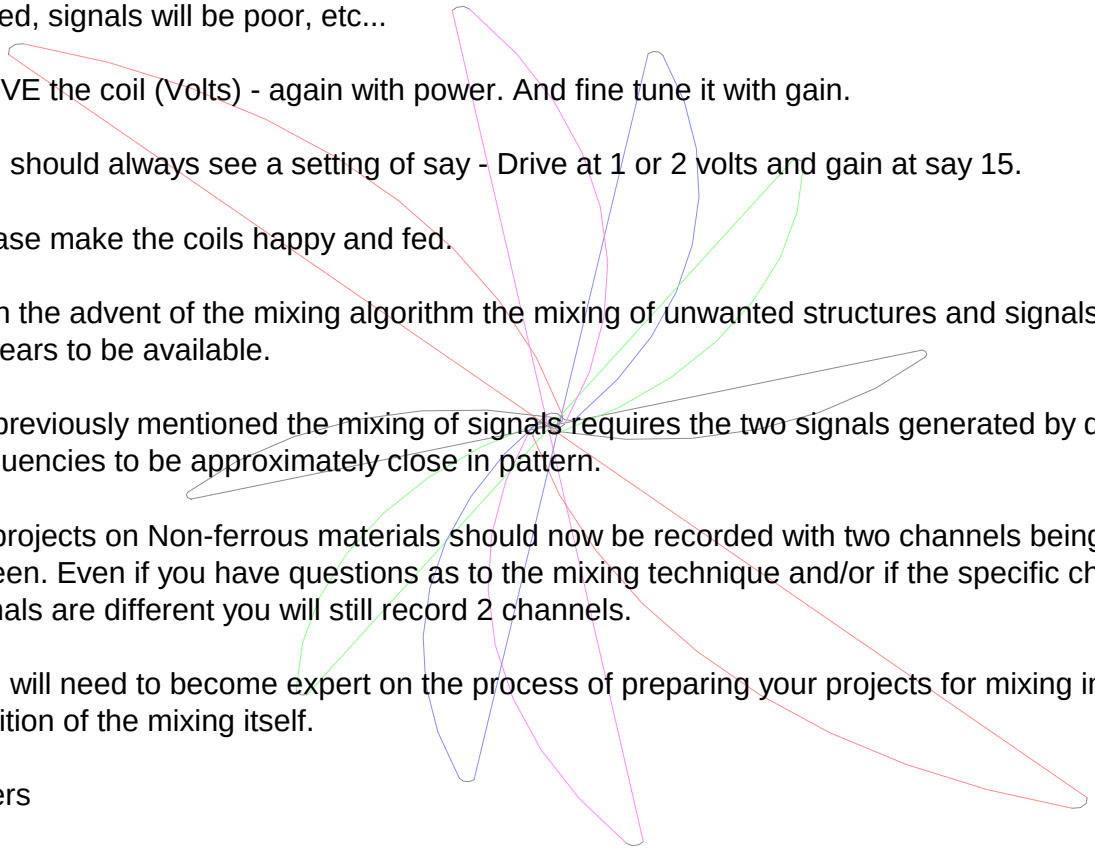
The food is - POWER.

THE equivalent of a triple 1/4 pounder burger, cheese, all the extras with a super-duper sized fries is POWER to a coil.

A big fat flux field needs those whoppers. SO PUMP UP THE JAM.

Think of power to a coil as course gain, and gain as fine gain. Feed the coil with POWER and adjust the pants belt size with gain. (fine gain).

So a power setting of .03 volts and a gain of 45 is all wrong. You have not driven the coil and seeing that you make up for it with gain. This is as upside down as my mortgage. A coil will wander across the screen, It will drift in and out of balance, signal to noise ratios will be raised, signals will be poor, etc...



DRIVE the coil (Volts) - again with power. And fine tune it with gain.

You should always see a setting of say - Drive at 1 or 2 volts and gain at say 15.

Please make the coils happy and fed.

With the advent of the mixing algorithm the mixing of unwanted structures and signals appears to be available.

As previously mentioned the mixing of signals requires the two signals generated by different frequencies to be approximately close in pattern.

All projects on Non-ferrous materials should now be recorded with two channels being on screen. Even if you have questions as to the mixing technique and/or if the specific channel signals are different you will still record 2 channels.

You will need to become expert on the process of preparing your projects for mixing in addition of the mixing itself.

Filters

As we know our scopes have a filter module that allows for filtering of unwanted signals to be eliminated. These signals can be almost anything but usually are noise type signals generated by power related issues.

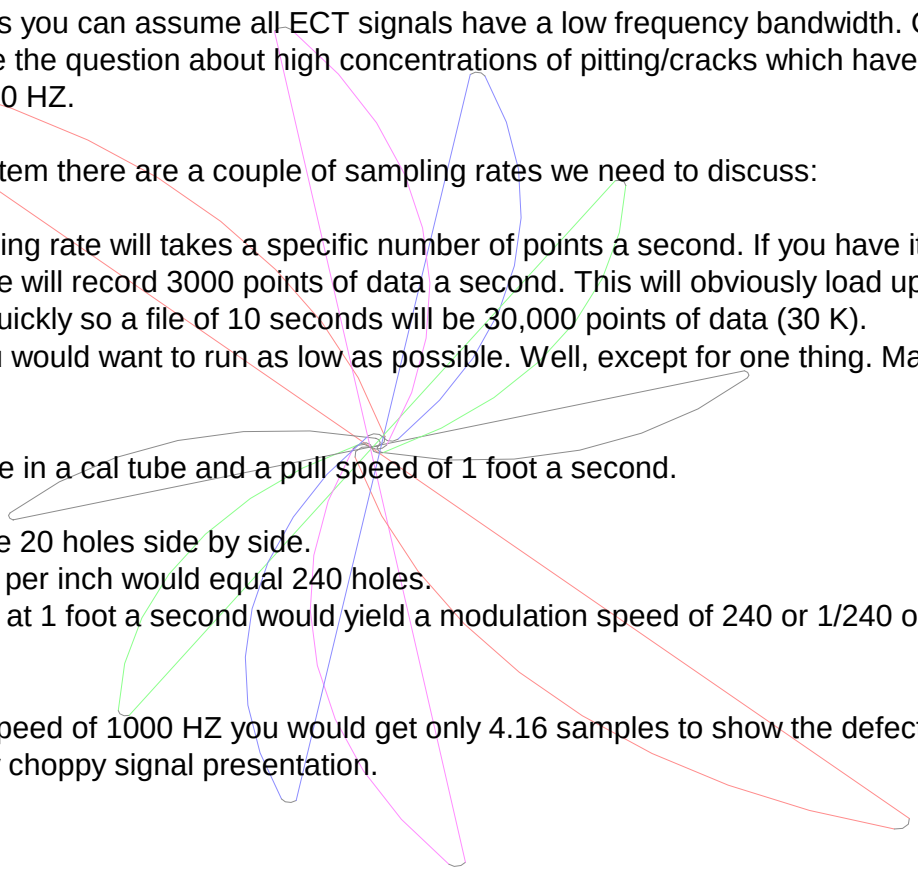
The terms - Low pass and High pass - basically mean that a certain frequency component is passed through to the secondary conditioning circuits or operations. So a Low pass filter sends low frequency signals on to secondary operations such as gain, rotation, etc.

An example would be a noise from power supply problems which would tend to carry a 60 HZ component which correlates to the frequency of the power supply. Assuming you have Eddy Current signals with a frequency spectrum of  0 to 30 HZ then you would use a Low pass filter set at 35 HZ to pass all the ECT data to the secondary operations and cut all frequencies above 35 HZ and eliminate the 60 HZ power noise.

For general purposes you can assume all ECT signals have a low frequency bandwidth. OK now, so don't ask me the question about high concentrations of pitting/cracks which have band widths above 30 HZ.

Now, as a digital system there are a couple of sampling rates we need to discuss:

The recording sampling rate will takes a specific number of points a second. If you have it set at 3000 HZ the scope will record 3000 points of data a second. This will obviously load up your files size very quickly so a file of 10 seconds will be 30,000 points of data (30 K). Assumably, then you would want to run as low as possible. Well, except for one thing. Math below.



Assuming a .050 hole in a cal tube and a pull speed of 1 foot a second.

Each inch could have 20 holes side by side.
One foot of 20 holes per inch would equal 240 holes.
So passing one hole at 1 foot a second would yield a modulation speed of 240 or 1/240 of a second.

Now at a sampling speed of 1000 HZ you would get only 4.16 samples to show the defect. This would be a very choppy signal presentation.

Back to filter.

The filter will take every recorded sample point and do a repetitive sampling based on the sample rate set on the filter.

This does not take up disk space and only slows the presentation on screen on really slow computers. So say 3000 sample points sampled at 3000 (filter rate) would yield a 9,000,000 effective sampling algorithm. Our computers run at around 1 GHZ so you have about 991,000,000 samples a second speed of head room. Our computers will see no ill effect by these rates.

OK - Now lets look more.

In a digital system with only sampling to highlight a signal, a slow rate any where (recording sampling or filter sampling) will have the overall effect of filtering. Say a signal of 10 HZ sampled at 1 HZ can only be represented with one point (10 HZ = ten points taken, 1 HZ = 1 point a second). As you can see one point is not very good and does not even make a line as it takes two points to make a line (start and finish).

So the filter sampling rate should be kept as high as possible to give more points of sampled recorded data. You may have noticed that a filter sampling rate of 3000 HZ will tend to show more noise as it is showing more sampling points per sampled point, and thereby more definition to your data, which if noisy will give appearance of more noise. This is even with a set filter cut off.

So what does this mean. You need to set both the filter sampling rate and filter cut-off frequency to get the best presentation as possible.

A low-pass filter is a filter that passes low-frequency signals and attenuates (reduces the amplitude of) signals with frequencies higher than the cutoff frequency

An ideal low-pass filter completely eliminates all frequencies above the cutoff frequency while passing those below unchanged.

MD500 Software

When operating the software package you must be aware of the parameters you are setting. Certainly this includes the operating frequency, rotation and gain but does also include filters and averaging.

When you are operating the software package it is imperative that you know what filtering and averaging you have set.

On the main screen - in the upper right corner the will be two written items (in blue) that tell you that you have either the filter or the averaging (or both) turned on.

These items are:

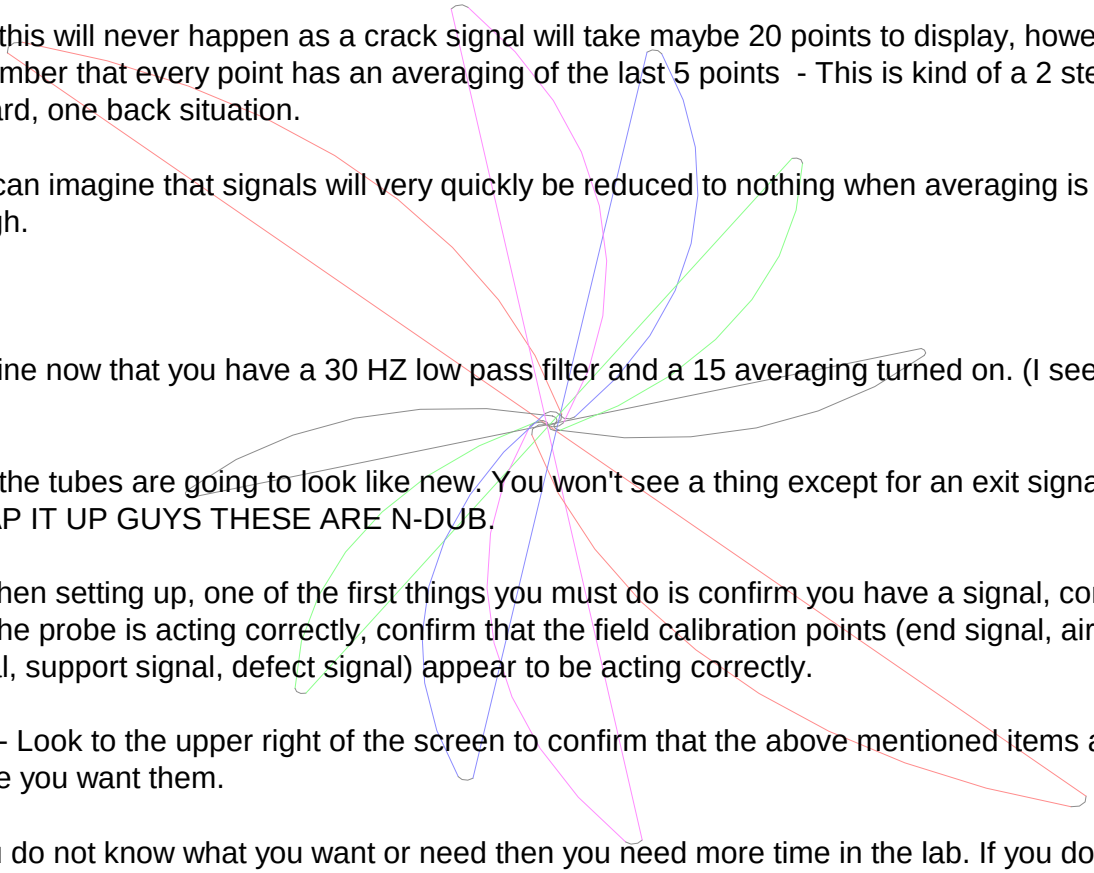
LoPass (in blue)
This represents that you have selected a low pass filter to b applied to your data. The filter selection should be in a range to remove unwanted noise while not reducing the data. If you do not know what the previous statement is referencing you should not really have the filter turned on. There are a number of filter selections (low pass, high pass, band pass) that would apply to different situations. If you have questions please feel free to ask me. You may also go to youtube.com and type in filters for a tutorial.

SwAvg (in blue)
This represents that you have selected an averaging function to be applied to the data. The averaging should be kept in the low number range (3 and below) so your data is not reduced/minimized to a great degree. The averaging is somewhat different from a filter as is takes a number of points (if you selected 5 then it would take 5) from the recorded/buffered data and averages them together to apply to the next data point. So, what this means is that defect signals that happen in  time frame faster that 5 points (cracking for instance - using the 5 points a previously mentioned) would be reduced to the average of these five points.

OK - so, assume that a sharp, tight crack occurs over a 2 point time frame. and the your signal returns to average - the center null. The crack signal impulse f two points and 3 points of center null would be averaged together and if anything came through it would be a small impulse.

Now this will never happen as a crack signal will take maybe 20 points to display, however remember that every point has an averaging of the last 5 points  - This is kind of a 2 steps forward, one back situation.

You can imagine that signals will very quickly be reduced to nothing when averaging is turned to high.



Imagine now that you have a 30 HZ low pass filter and a 15 averaging turned on. (I see this a lot)

Well the tubes are going to look like new. You won't see a thing except for an exit signal. WRAP IT UP GUYS THESE ARE N-DUB.

So when setting up, one of the first things you must do is confirm you have a signal, confirm that the probe is acting correctly, confirm that the field calibration points (end signal, air signal, support signal, defect signal) appear to be acting correctly.

Now - Look to the upper right of the screen to confirm that the above mentioned items are where you want them.

If you do not know what you want or need then you need more time in the lab. If you do not know what a filter is or how to use it you need to ask, and need time in the lab.

You as the tech need to know where you are at - on screen.

# Plant Permits

Magnetec wants to make sure you have a full in depth knowledge of the permitting system.

Basics - You will always need a permit to work in a plant.

You can not simply walk around testing exchangers, camera in hand, phone to the ear.

If you don't know, if you know, assume that you don't know, and ASK if the permit has been issued and review it yourself.

OSHA standards basically control actions within a plant to minimize accidents. This is primarily based from the work permitting system. This we all know, was presented in safety classes, is beat into your heads.

There is only one way to not have a permit. - When the permit writer say you don't need one.

The PERMIT WRITER SAYS YOU DONT. NOT YOU.

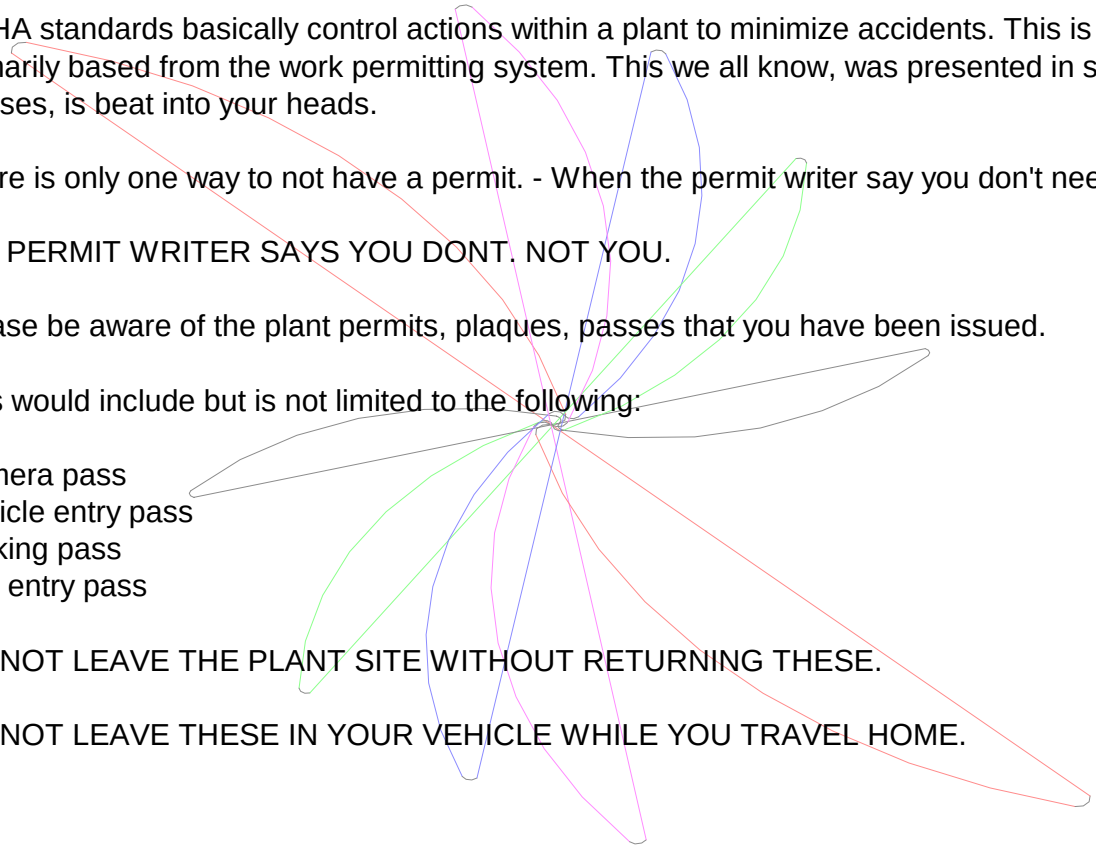
Please be aware of the plant permits, plaques, passes that you have been issued.

This would include but is not limited to the following:

Camera pass
Vehicle entry pass
Parking pass
Unit entry pass

DO NOT LEAVE THE PLANT SITE WITHOUT RETURNING THESE.

DO NOT LEAVE THESE IN YOUR VEHICLE WHILE YOU TRAVEL HOME.



# Channel Heads

Most all plants now describe a channel head as confined space.

When you get a permit you must ask the permit writer if the channel head is a confined space.

If he/she say's no it is not,  You need to re-affirm the question and have them verify with safety that is not a confined space. If they determine it is not a confined space ask them to initial the confined space checkbox, line, etc..

When the plant guy then asks, why are you in a confined space you can display the permit. At that point it is a plant problem and not a Magnetec problem.

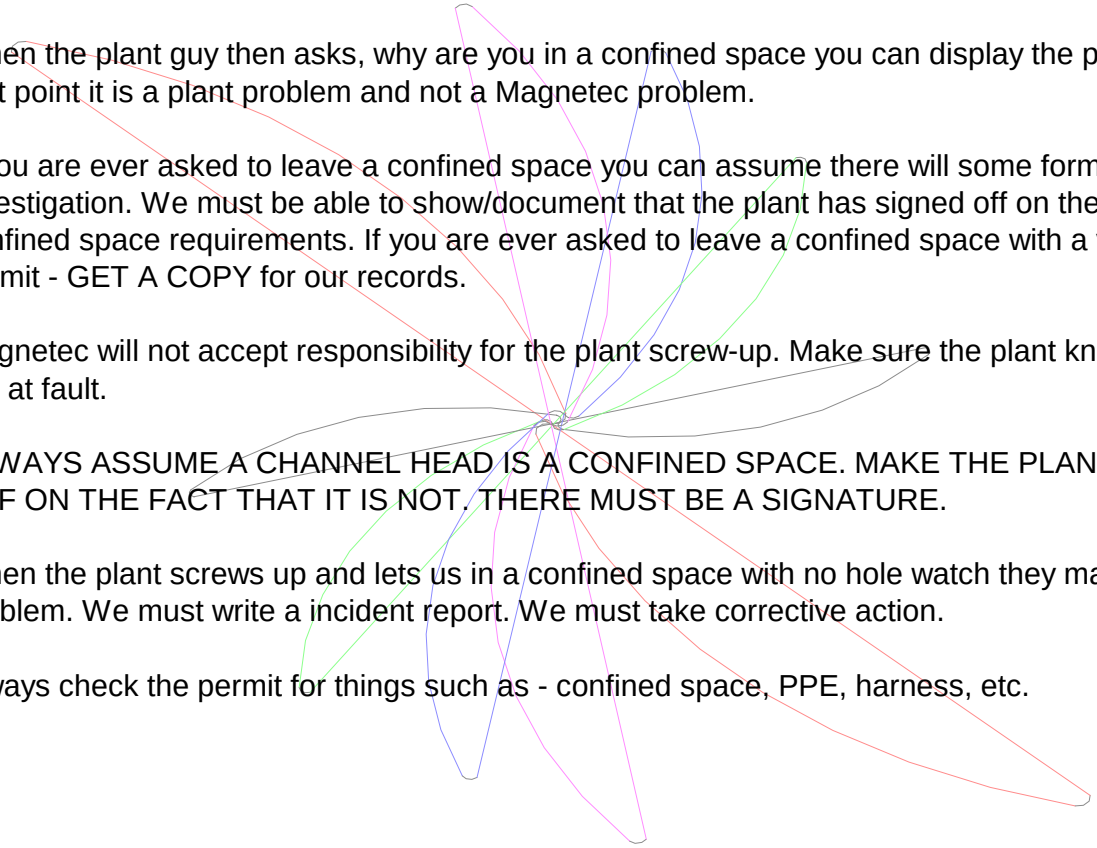
If you are ever asked to leave a confined space you can assume there will some form of investigation. We must be able to show/document that the plant has signed off on the confined space requirements. If you are ever asked to leave a confined space with a valid permit - GET A COPY for our records.

Magnetec will not accept responsibility for the plant screw-up. Make sure the plant knows they are at fault.

ALWAYS ASSUME A CHANNEL HEAD IS A CONFINED SPACE. MAKE THE PLANT SIGN OFF ON THE FACT THAT IT IS NOT. THERE MUST BE A SIGNATURE.

When the plant screws up and lets us in a confined space with no hole watch they make it our problem. We must write a incident report. We must take corrective action.

Always check the permit for things such as - confined space, PPE, harness, etc.

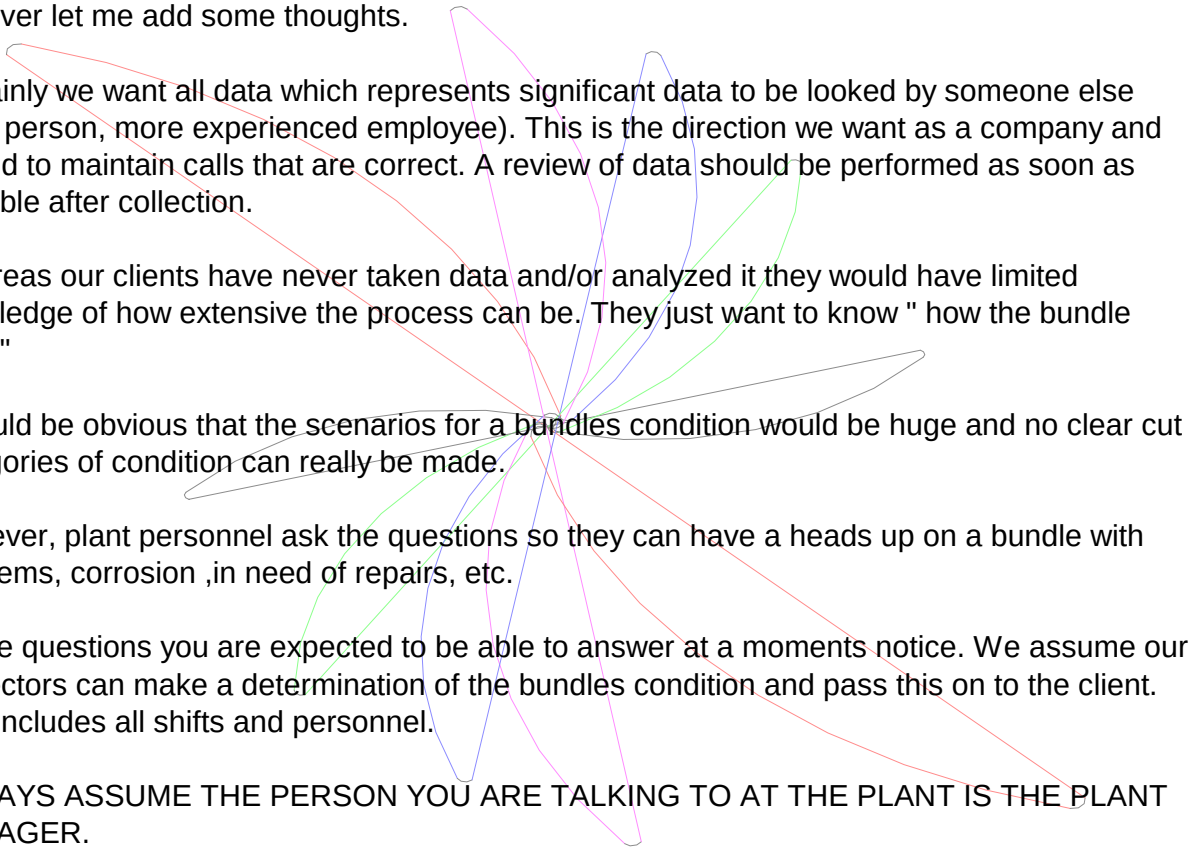


# Data Analysis

A few of our clients have asked if we would have personnel who can analyze data on every shift.

I assume this has derived from our personnel not being able to give a general determination of the bundles condition when asked from plant personnel. This has been mostly on night shifts.

I know we have a policy where we want data to be analyzed by the lead person on every job however let me add some thoughts.



Certainly we want all data which represents significant data to be looked by someone else (lead person, more experienced employee). This is the direction we want as a company and should to maintain calls that are correct. A review of data should be performed as soon as possible after collection.

Whereas our clients have never taken data and/or analyzed it they would have limited knowledge of how extensive the process can be. They just want to know " how the bundle looks"

It would be obvious that the scenarios for a bundles condition would be huge and no clear cut categories of condition can really be made.

However, plant personnel ask the questions so they can have a heads up on a bundle with problems, corrosion ,in need of repairs, etc.

These questions you are expected to be able to answer at a moments notice. We assume our inspectors can make a determination of the bundles condition and pass this on to the client. This includes all shifts and personnel.

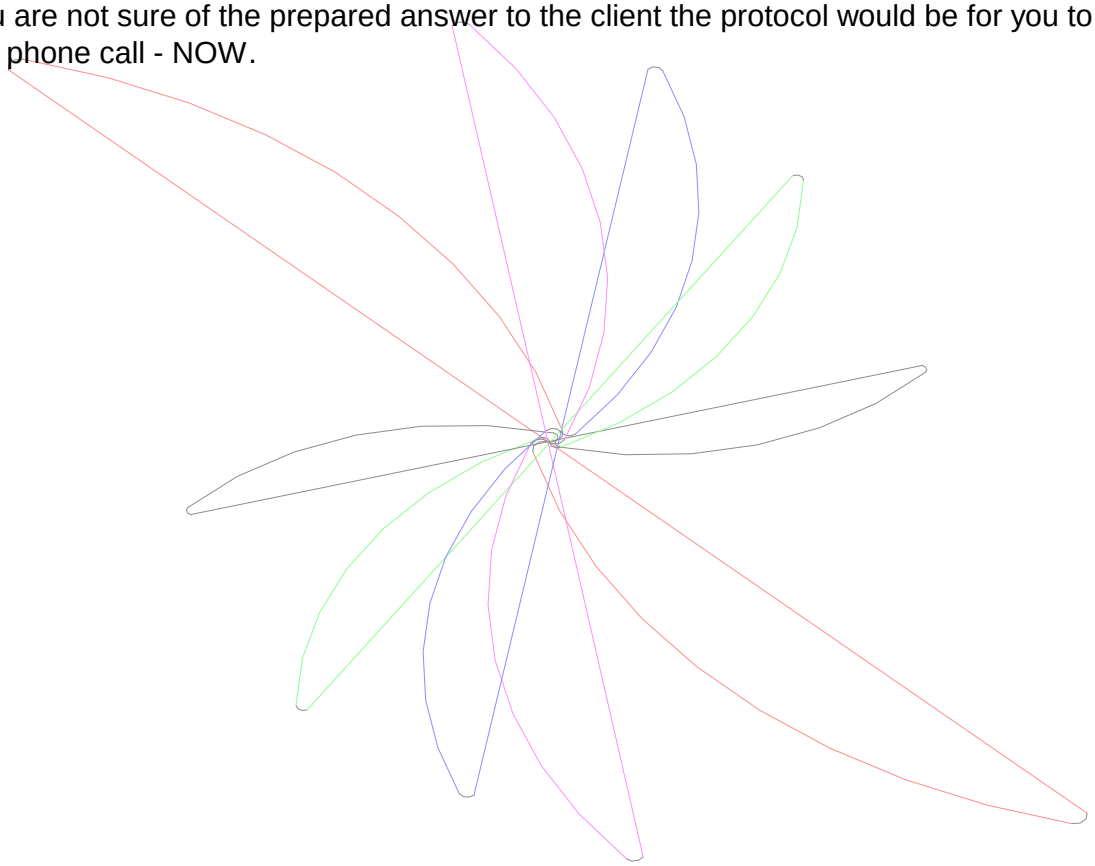
ALWAYS ASSUME THE PERSON YOU ARE TALKING TO AT THE PLANT IS THE PLANT MANAGER.

Information and the representative verbiage can be tailored and manipulated to provide complete, concise information while still preserving the absolute call for the bundle. You should be able to give relative conditional assessments, relative corrosion types and depths, probable repair scenarios, inspection completion status, etc.

As you begin, process and complete an inspection you need to be asking yourself the questions the plant is going to ask. You need to have these responses prepared and ready for delivery at any time.

More than half of politics is knowing your response prior to a question. There is no unrehearsed question.
You need to know the answer prior to the question being asked.

Following the 50% rule - if you are on a job site and have a very severely corroded bundle and you are not sure of the prepared answer to the client the protocol would be for you to make a phone call - NOW.



# Recording Footage

**Recording Footage:**

• Record a least a minute of data of the defect. Slowly move up to the defect from a 6” away position. This will show if the defect is isolated or part of a larger corrosion area. Slowly move past the defect to 6” beyond. This will also show the area of tubing near the defect and other areas of corrosion. Position the probe directly on defect (make sure defect is clearly visible) and take 20-30 seconds of video.

• Prior to tearing down equip. review the video sequence on your recording device. And confirm you have actually recorded something. This may include getting to a computer monitor to review on actual size screen.

**Safety and Care:**

• Do not leave the video probe in the tubing while you go to lunch, review data, etc.

• Be aware of additional personnel around you as you video scope. Other personnel (contractors) have a way of just stepping on cable, hoses, etc. which will but major damage to video units. In these cases simply roll up video probe and wait to the side and when they are gone continue.

• Be aware of running additional video cabling over scaffold, down on hot piping equipment, into unknown.

• Be aware of pinch points which cold put crimp in cabling which could cause major damage.

• Be aware of changing conditions which could allow water into main processor such as rain, nearby hydro-blasters, your open water bottle, etc.

• Be aware of dust particles, foreign matter/material in the area, in the air, positioned above that will become dislodged (when contractor pulls his air line) and get dumped on processor.

• Thoroughly clean you equipment prior to storage. DO NOT SIMPLY REWIND VIDEO CABLE INTO BOX. You must clean the video equipment prior to replacement into storage box.

• When pulling video probe up on a rope please fully surround the shipping box and tie off to handle. In this way when the handle rips off the video probe is still intact and when the rope slips around from box the handle is still there to catch it.

# Exchanger Labeling System

The following is the labeling system for exchangers inspected by Magnetec Inspection, Inc.

Reference markings

Proper orientation of the exchanger must be confirmed prior to any marking.

On the top (open) area of the exchanger the specific Hx number must be written.
The number should be centered and written legibly. The date must be put to the right of the number. Both should be visible and identifiable in a photograph.

The specific row/tube numbering should be established. (Top down, Center out)

Every fifth row should be circled in white and the associated number marked to the left of the marking.

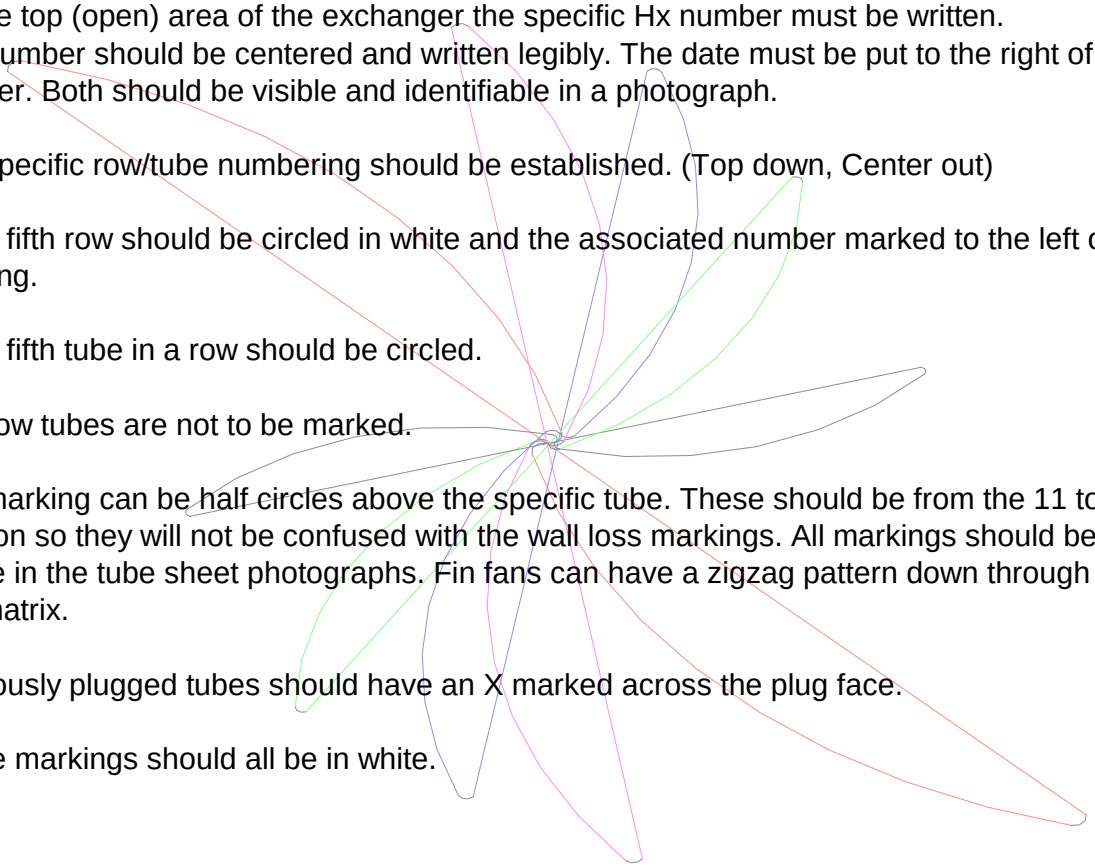
Every fifth tube in a row should be circled.

End row tubes are not to be marked.

The marking can be half circles above the specific tube. These should be from the 11 to 1 position so they will not be confused with the wall loss markings. All markings should be visible in the tube sheet photographs. Fin fans can have a zigzag pattern down through the row matrix.

Previously plugged tubes should have an X marked across the plug face.

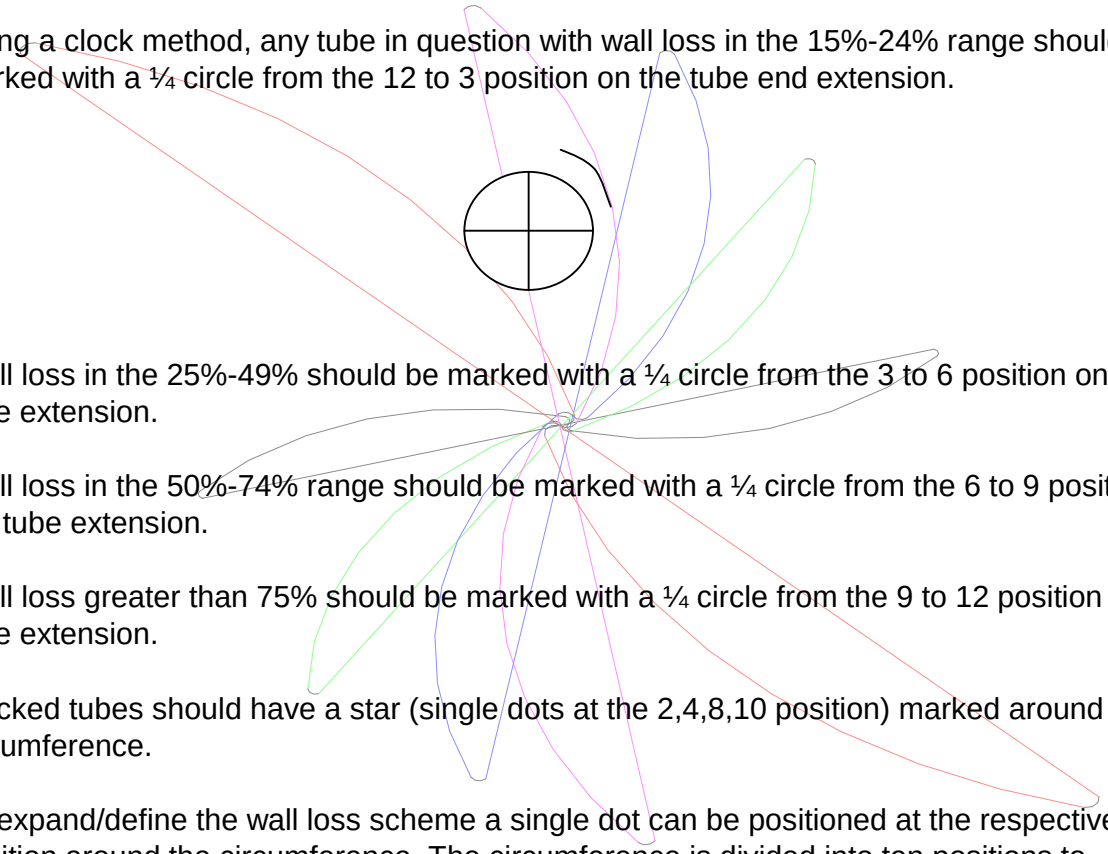
These markings should all be in white.



The numbering schemes below are generally for inspections that are not recorded. Recorded tubes have the defects and locations by virtue of the recording system itself.
The inspector is marking the tubes so they can be written down after the inspection.

Wall loss markings.

Using a clock method, any tube in question with wall loss in the 15%-24% range should be marked with a ¼ circle from the 12 to 3 position on the tube end extension.



Wall loss in the 25%-49% should be marked with a ¼ circle from the 3 to 6 position on the tube extension.

Wall loss in the 50%-74% range should be marked with a ¼ circle from the 6 to 9 position on the tube extension.

Wall loss greater than 75% should be marked with a ¼ circle from the 9 to 12 position on the tube extension.

Blocked tubes should have a star (single dots at the 2,4,8,10 position) marked around the circumference.

To expand/define the wall loss scheme a single dot can be positioned at the respective position around the circumference. The circumference is divided into ten positions to represent each 10% of loss. A 50% wall loss would be positioned at the 6 position.

The marks should be on the tube extension so adjacent tubes are not confused with the loss.

These marks should be in yellow.

Any tubes to be plugged must be marked in red. These must be clearly visible on the tube sheet and on the photos.

Locations can be marked in yellow on the outer periphery of the tube extension. The same methodology should be used as with the wall loss. A defect in the first ¼ of the tube will be marked with a ¼ circle from the 12 to 3 position. To expand/define this system a dot can be utilized to locate a defect.

A list of loss and locations should accompany the field copy for reporting purposes.

Note: A defect has both a wall loss and location identifier. Not every defect is “entire tube length” - Obviously cooling water bundles can have “Entire tube length”
If the defects are localized you should have location information also.

If there are large areas of localized corrosion (Eg.. shell side inlet thinning) a line should be drawn around the suspect area and through the tube matrix to outline the area. This should be visible in the tube sheet photo for reference on the summary and final reports. Any marking on the tube sheet should be labeled on the summary and final reports.

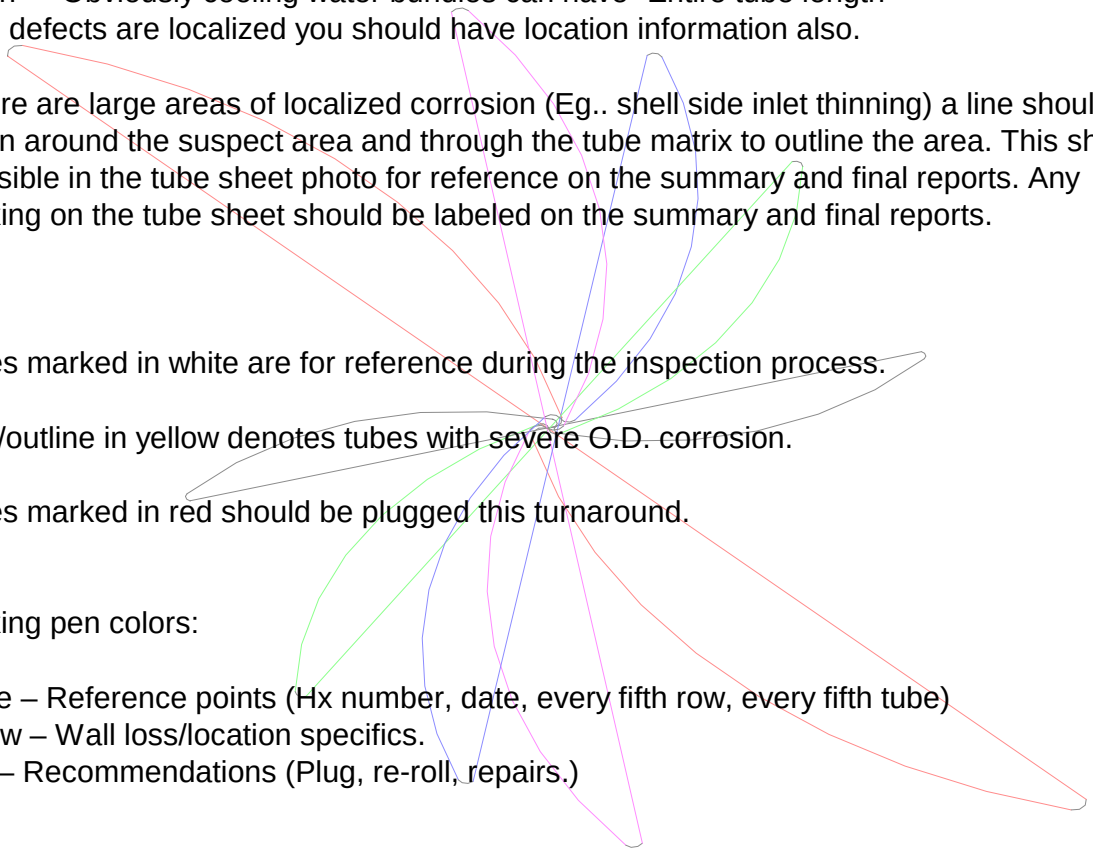
Eg..
Tubes marked in white are for reference during the inspection process.

Area/outline in yellow denotes tubes with severe O.D. corrosion.

Tubes marked in red should be plugged this turnaround.

Marking pen colors:

White – Reference points (Hx number, date, every fifth row, every fifth tube)
Yellow – Wall loss/location specifics.
Red – Recommendations (Plug, re-roll, repairs.)



# Exchanger Tagging Sequence

The following are guidelines for the tagging of exchangers.

At the completion of the  inspection process an exchanger tag will be placed on the exchanger (eg. Green, hold, repair, etc..) so the clients and other inspectors will have visual queue as to the status of their exchanger.

The exchanger tags will be placed as follows.

1) The tag must contain as much guidance information as possible for the clients. RTS is an acronym of Magnetec only, please write out Return to Service.

2) The exchanger is to be placed as close to the top of the bundle as possible. The tag is to be placed on a tie-rod if possible. As viewed looking at fixed tubesheet they go on the right hand side.

3) The tag will always be located at the fixed tubesheet and approx 6" from backface. Tags to not affix to holes in tubesheet, to pulling lugs, to old tags.

4) The tag is to be fully cinched down as tight as possible with the zip-tie. Do not leave loose tags to flap in the wind.

5) The green tag is always the first tag. Secondary tags will be positioned thereafter and spaced 1" apart.
If the bundle is scrap then the first and only tag will be the scrap tag.

6) Tags will not be layered one on the other with one cinch tie to hold the whole lot. They will all be separate and visible.

7) Contrary to Clients belief (Dan Meisner - BPHOH) there can be a whole string of tags.
Green - the bundle is god to go.
Repair - a specific repair is required.
Hold - there is a hold point.
As each process is cleared the final tag is Green - Oh, it is so simple.

8) If there is a repair tag then there should be explanation of repair.

9) If there is a hold tag there should be an explanation for the hold request.

The writing should be in permanent marker.

We do not loan out tags.

# Tube Samples

This is a re-issue of procedure which has been sent many, many times before.

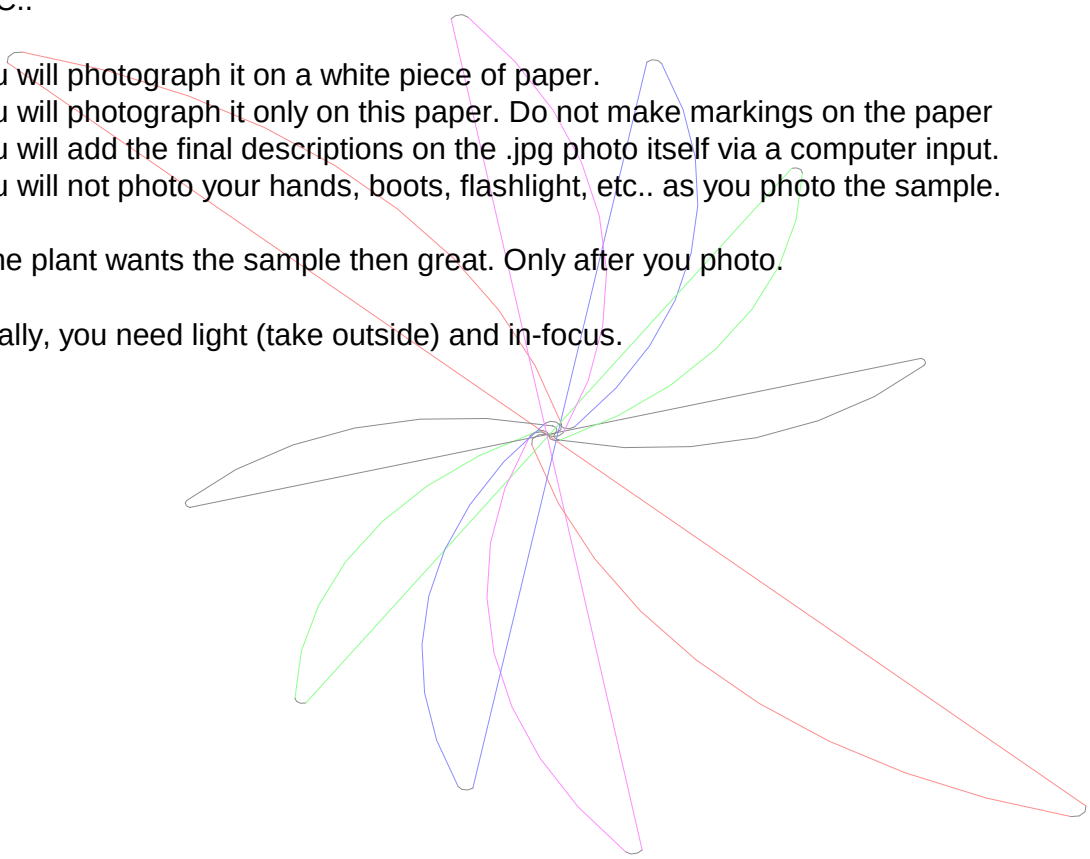
When photographing samples which may be any of the following:

A tube pulled from a bundle
A split tube which was opened to show corrosion
A prepared cross section of a sample tube (prepared in a PVC, bakelite disk)
A deposit pulled from an exchanger
A piece of mechanical debris found in a tube.
ETC..

You will photograph it on a white piece of paper.
You will photograph it only on this paper. Do not make markings on the paper
You will add the final descriptions on the .jpg photo itself via a computer input.
You will not photo your hands, boots, flashlight, etc.. as you photo the sample.

If the plant wants the sample then great. Only after you photo.

Finally, you need light (take outside) and in-focus.



# Inspection of Shop Exchanger

Inspection of Shop Exchanger - .625 X .049 X 5’ Brass bundle.

Please read, understand, and comply with all the instructions herein.
You are going to perform an inspection of the MII test bundle (Brass exchanger) as if it were a client exchanger. You are performing this inspection as though it were a real one on an actual jobsite. Read all instructions here as you are responsible for everything that is set forth for this test. Your skills and knowledge are being tested in several aspects of what is involved in the inspection, recording, documentation, reporting, and submitting of results to one of our clients. Treat it as an actual inspection and you alone are the person doing the job and have to do it all! You essentially will be responsible for everything that would be needed to complete a full inspection and report the results of your test as well as interact with DataCentral like normal in these situations. You may ask for some limited clarifications prior to the start of the project

BY ALL MEANS NO ONE AT MAGNETEC IS TO DISCUSS ANYTHING WITH ANYONE ELSE REGARDING THE TEST BUNDLE.

Before starting the test you should be certain that all your equipment, software, etc. is working properly because once you start the test you don’t want these issues to delay your performance.
Take the time to read through the instructions at least once before you start the test in order to get acquainted with what you will be responsible for. You are being graded on how long you’re testing takes.

At the start of the inspection you will report that you are “Starting the inspection”.
At the end of the inspection you will report that you have “Stopped the inspection”.
You will have 4 HOURS to complete the project. You may divide the time as you require.

The client is Marathon – Robinson, Illinois. (MPIL) Job # 001-10.
The exchanger is 1E1a , material is .625 X .049 X 5’ SB-111 Inh. Adm. Brass.
The Hx Service is Test Bundle.
You have no defined history for the exchanger however you can assume that it is 5 years old.

You will have to submit an electronic Job Folder as created on your computer named correctly and with all the proper usual contents (know your Folder/File rules) with all files named correctly. A .pdf of the Summary report should be in this folder. You will not need an HX form.

You will not write out a field copy but WILL generate an Excel Summary file on your computer. There is no need to print anything to submit for this process. Everything gets done in electronic form.

You will need to take photos and submit them appropriately in the bundle project folder as well as include them into the Summary (report) file.

You will be generating a drawing in FlareTubesheet in order to provide a .ts file as well as .jpg of that drawing which will be included in the Summary. Wall losses should be shown in the drawing in the colored circles. These files will end up in the bundle (project) folder.

The Summary report must have all the usual content like Ts (front-verbage), Data pages, Tabulation TAB, Tubesheet, Photo pages, and a Screen print into a photo slot. The History page can be omitted.

You will set up and use your own personal data taker (computer). A Flare scope may be provided if you don't already have one. During the complete process you are not to ask questions and/or ask for direction from anyone. Again, you may ask for some limited clarifications prior to the start of the project. A Calibration Tube is provided specially for the test bundle but you will need to select your probe from MII probe bins unless one is already provided.

As per Magnetec guidelines you will record three (3) initial calibrations. This should be done in the Calibration mode. You will report on at least one of the greatest defects from one of these three recordings. You must provide a screen print (Screenshot) of this defect. The 80% Cal Tube defect should be 80 percent of the full screen. The phase spread between the 100% to 20% phase angles should be approx. 85 degrees. You will use the provided Cal Tube to set up a calibration curve. All defects are to be determined by using that calibration curve.

Tubes must be pulled slower than 1 fps (foot per second).
Your calibration curve is Channel #1 – Angle.

As would be usual for an inspection you are to provide the following.
1) Completed Summary report with all verbage, data, tabulations, drawing, photos, plus screen print into a photo slot. This will be submitted on a CD into the proper folder along with all the other usual folders/contents. Again, know your Folder/File rules.
2) The Edata project is to be put to a CD, labeled correctly, and submitted as well to Ethan or Leigh. It should have all the proper contents (data, EPRJ, EPBK, etc.).
This means that 2 separate CD's need to be made. 1 for Job / 1 for Edata.
3) All defects in the Edata are to be determined by using the proper calibration curve.
4) All defects are to be determined by using the "Report Defect" mode.
5) All defects are to have the locations determined as well.
6) Only the greatest defect per tube is to be reported.
7) All tubes used as in-service cal-tubes are to have notes attached. (Top, Row 1 Tube 1 is in-service cal-tube (It has 100% hole at 4 ¾").

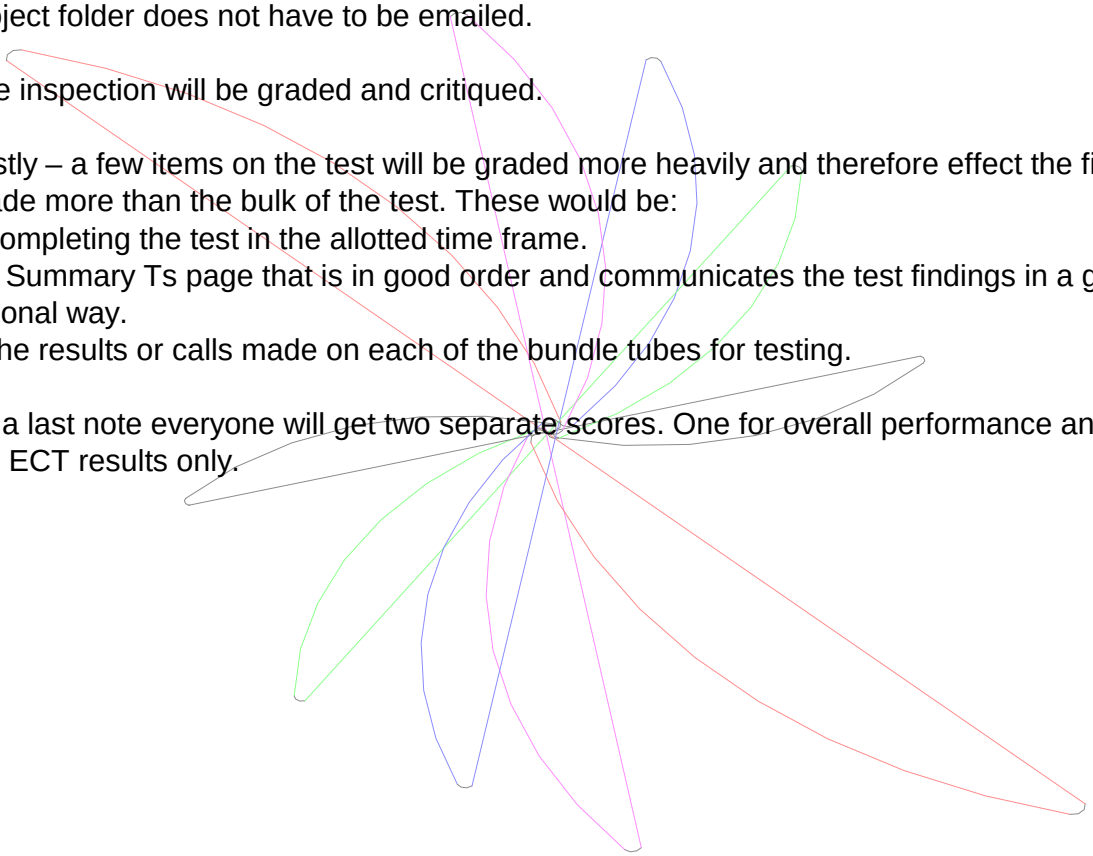
8) The 2 cut out tubes shall be considered plugged tubes.
9) It should be made apparent wherever needed in the Summary report whether any defects are to the ID, OD, or both.

The complete Report (job) folder will lastly be emailed to ew@magnetec-inspection.com & lw@magnetec-inspection.com. This can be done after the testing time limit is over. The Edata project folder does not have to be emailed.

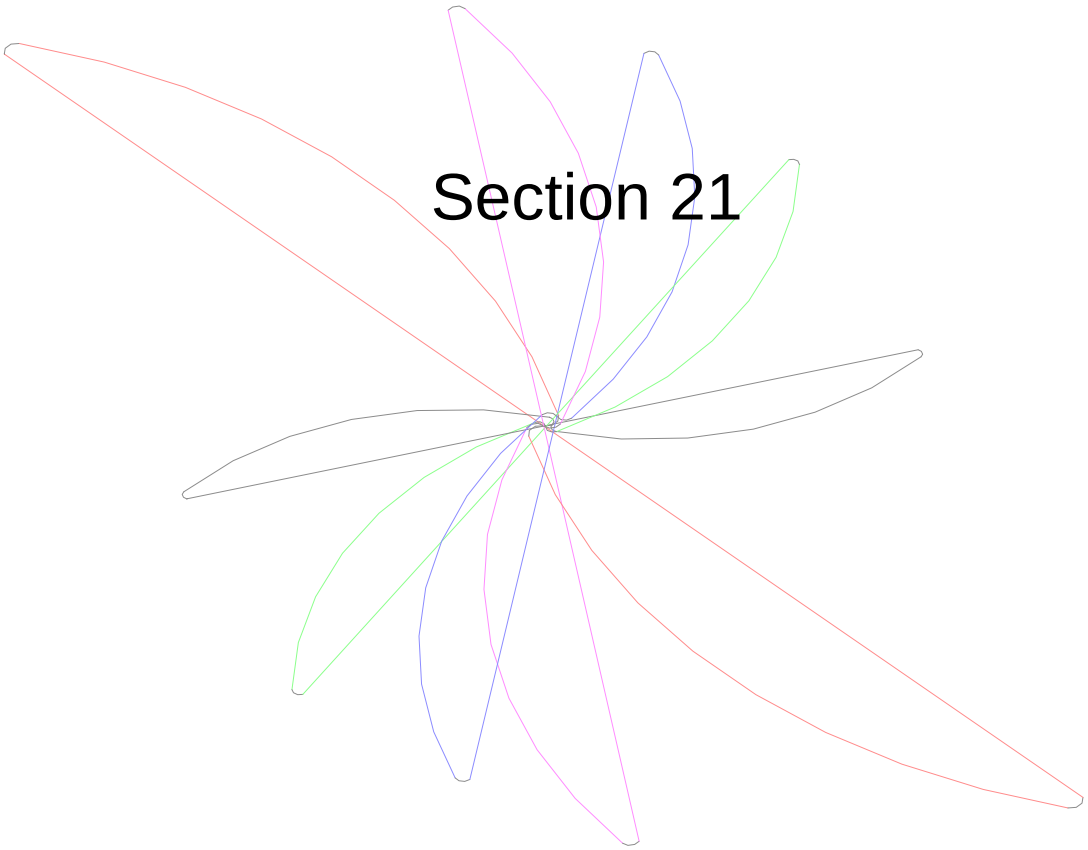
The inspection will be graded and critiqued.

Lastly – a few items on the test will be graded more heavily and therefore effect the final grade more than the bulk of the test. These would be:
• Completing the test in the allotted time frame.
• A Summary Ts page that is in good order and communicates the test findings in a good and rational way.
• The results or calls made on each of the bundle tubes for testing.

As a last note everyone will get two separate scores. One for overall performance and one for the ECT results only.



# Software
# Server
# MIApp
# &
# Tracking Systems



## Section 21

# Server

We have a directory on the server called MagProjects which is intended to have all the project folders generated during a TAR/Inspection.

The directory will essentially operate like the MxData (Edata directory), and Reports_PDF where you will be able to search for old repots and old project files.

The upload will be available from MxDataClient.

Assumably you will complete the project folders as usual and send to the DC for reporting. The DC will use the internal MxDataMgr at the server to upload the projects to the server.

Our intent is to have a project folder with the usual files (Photos, .csv, .ts, .jpg, final report) that we already generate on the job site.

We will now try to gather as much info as possible for the project folder which may include drawings, U1, histories, P&ID's, etc. (Digital format)

You can generate a word.doc and put notes, future inspection instructions, discovery information, etc.. to the next inspector. It needs to be saved in the project folder so it can be reviewed at a later date.

At this point you should take any digital file information specific to a bundle and put it in the appropriate folder. Ask our plant contact for this info.

There is nothing more valuable to an inspector than having all information on a bundle prior to the actual inspection.

The project files (.ts, .jpg,.csv, photos, client drawings) that return from jobs will be uploaded onto the server.

As always there needs to be a file format for this info. We will use the following file types.

This will comprise the usual first file name followed with the file type. (discussion, conversation, email, note)

MPIL_1E1a_12_06JUN_XXXX

_Discussion = A discussion of the specific type of corrosion, reason for corrosion, failure, etc. This would be info you my want in report or want the client to have. It is a discussion to other individuals.

_Conversation = A conversation you may have from yourself to another person. This would contain info you want to pass forward to the next inspector.

_Email = A direct copy of a email you sent to client with regard to the inspection.

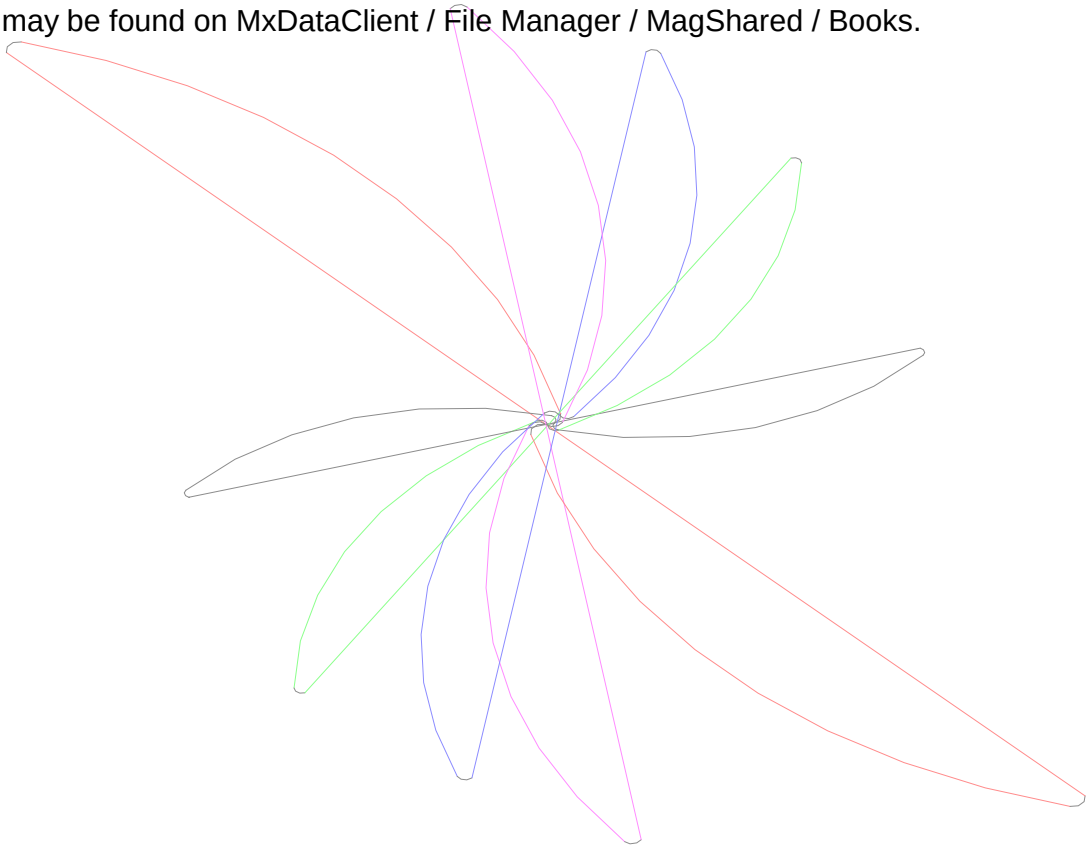
_FID = A abstract note you have with regard to anything (location of bundle, extension PVC piping required to do job, Probe size needed due to restrictions, power concerns, special tooling required, etc

FYI

There is a large amount of information on the server as reference material.

These are books from electronics, physics, heat exchangers, TEMA standards, etc.

They may be found on MxDataClient / File Manager / MagShared / Books.



# Job Tracking Form

A job number is pulled for every single job via the Job Tracking Form. The Job Tracking Form should be filled out completely by the person doing the job. All info must be on/or get to form. If you do the job you must get info to form.

When you are told you are going on a job, assigning that job a job number goes as follows:

1. Check your email for the most recent form.
2. Download the form.
3. Open the form and fill out the information to the best of your ability.
4. All cells have comment boxes, hover over the cell and you can see the box. The comment cells need to be filled out as completely as possible.
5. To open a comment box, right click on the cell and choose show comment.
6. Fill out the info and right click and select hide comment.
7. Save the form with today's date. If the form has been sent out already and underscore and the number 1 or 2 if it already has a 1, etc.

Example: JobTrackingForm010113 or JobTrackingForm010113_1 or JobTrackingForm010113_2

8. Email the Job Tracking Form to all Magnetec contacts.
E-mail headings should read - JobTrackingForm010113

E-mails should come from your Magnetec E-mail account.
(eg.. ab@magnetec-inspection.com)

You must always check your email for the latest greatest version. Do not just go to a saved version you have on your computer and update that. Always, Always, Always check your email first. Never make additions to the form and not send it out right away, because if you wait, someone may make an addition and now that one is the latest greatest and yours is not.

Also, the form has a time and date stamp at the top, there is no need to type on top of it. The time and date will never be wrong.

When adding information to the Job Tracking Form in the information/job description area please add as much information as possible. If you need extra room add a comment box to the cell and type bundle info there.

If you pull a number and/or a number has been assigned to you then you own the line. If you are on a large job, the lead inspector is responsible for making sure the info is entered on the Job Tracking Form.

This includes all information and comments on this line. It is your job and responsibility to have all lines as complete as possible.

You will have the missing information after the completion of a job and will have to edit a line.

You can not pass this responsibility to another employee.

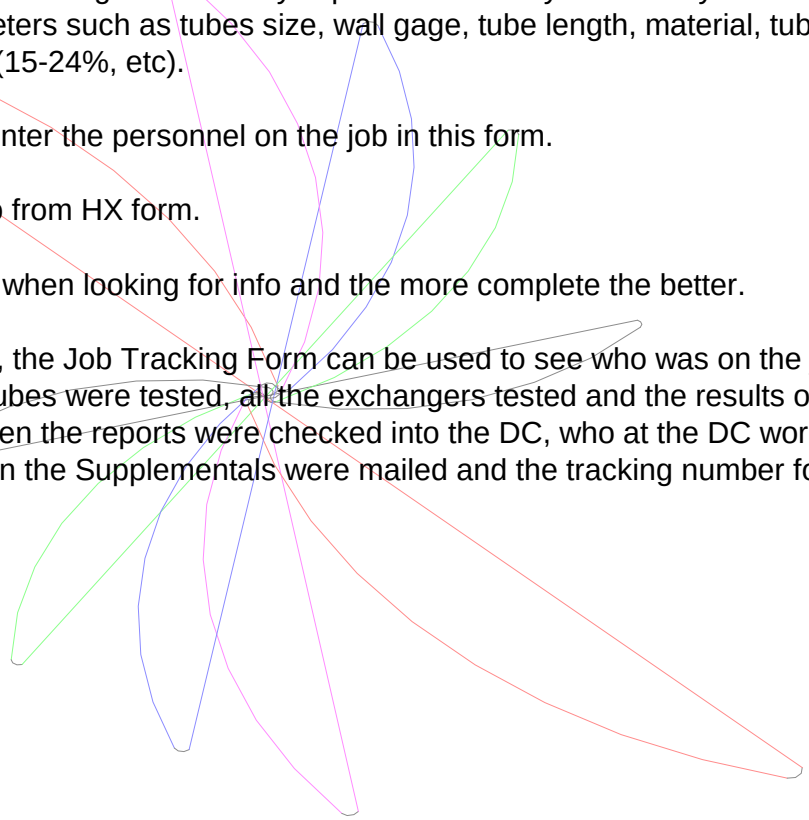
The addition of specific exchanger info is very important. Even if you test only one bundle enter the bundle parameters such as tubes size, wall gage, tube length, material, tubes tested, what was found (15-24%, etc).

Please insure that you enter the personnel on the job in this form.

This would be same info from HX form.

This is a great resource when looking for info and the more complete the better.

When properly filled out, the Job Tracking Form can be used to see who was on the job, how many exchangers and tubes were tested, all the exchangers tested and the results of the test, who the client rep is, when the reports were checked into the DC, who at the DC worked on the Supplementals, when the Supplementals were mailed and the tracking number for the package.

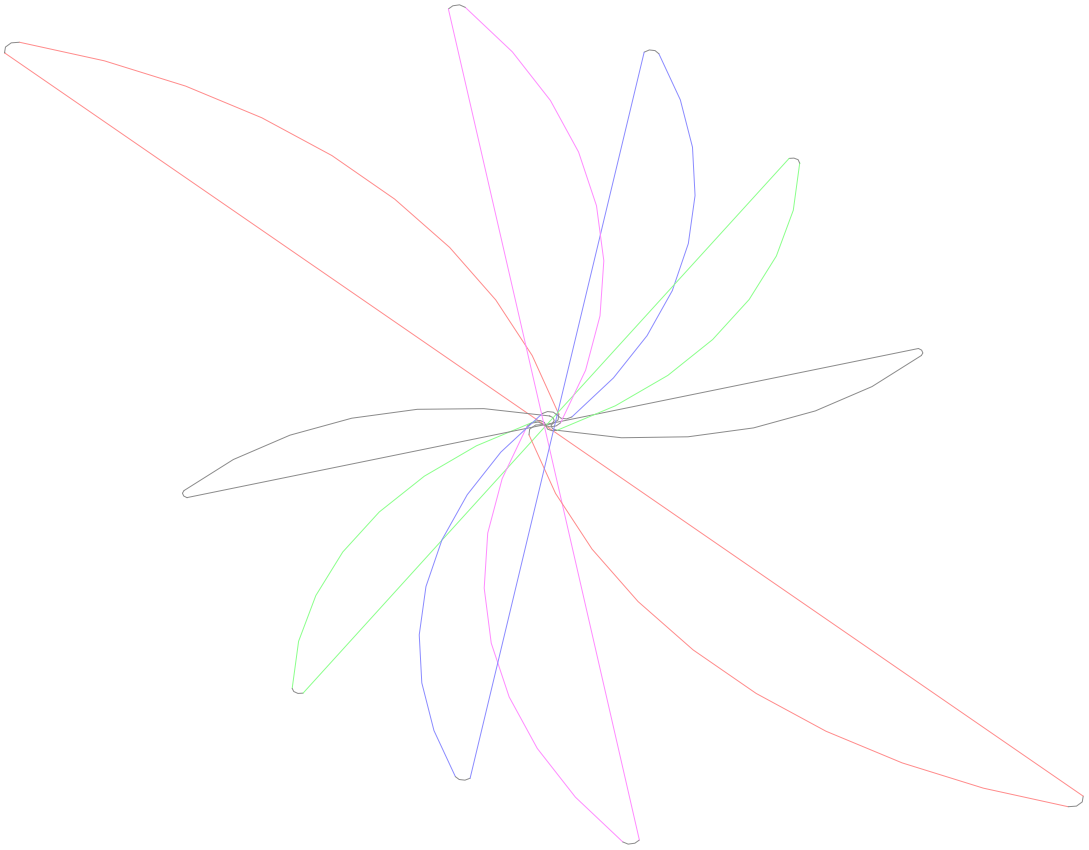


# Report Tracking Form

The DC employees who work on Supplemental Reports will complete a Report Tracking Form each week.

The tracking form will be sent to Donna, Michelle, Juanita, Angie, Ethan and Leigh.

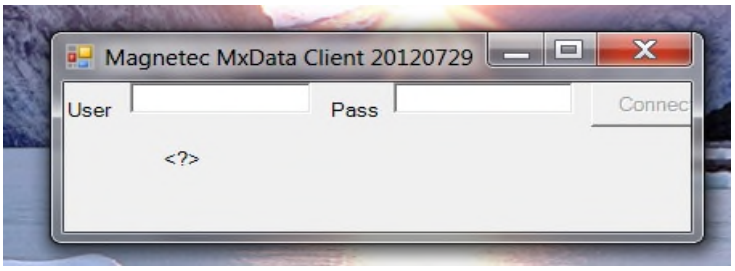
The report tracking form will follow the same naming system as the Job Tracking Form.



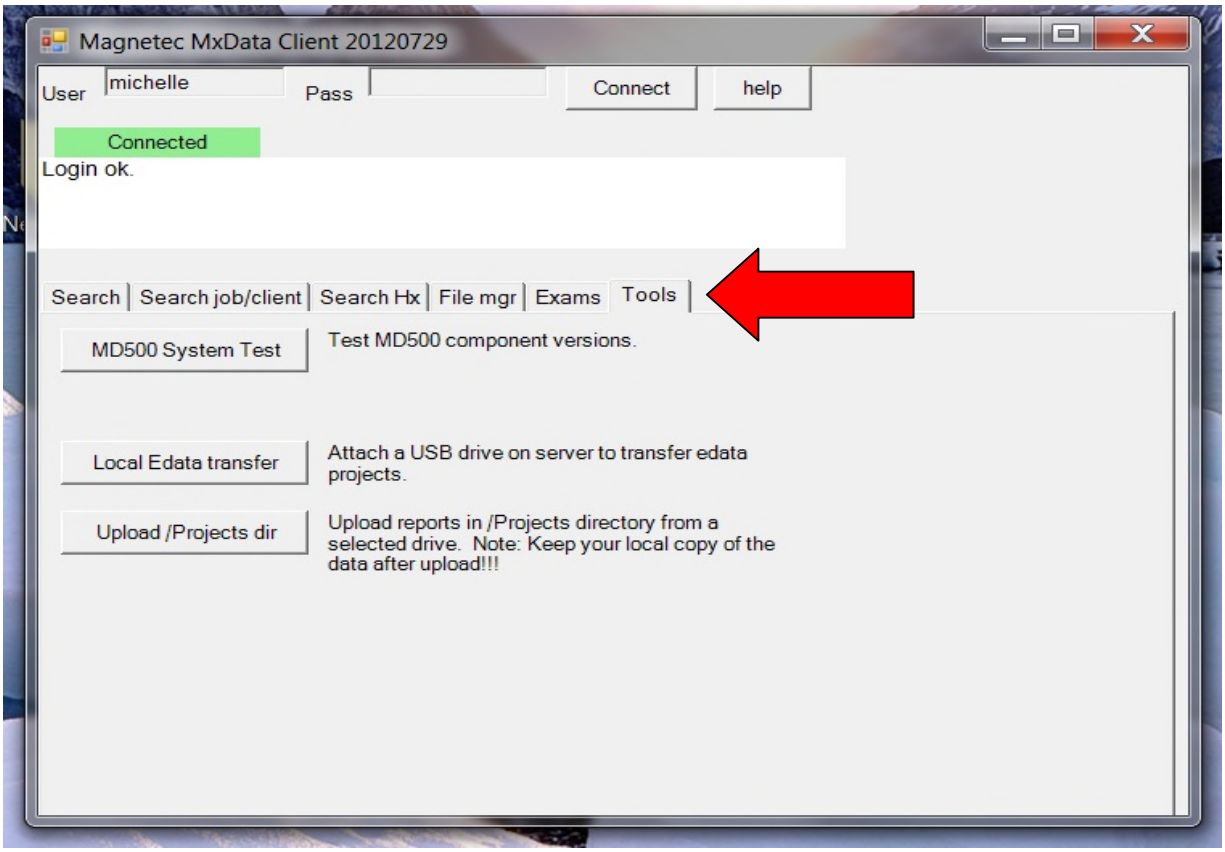
# Uploading

## Uploading a Project to Server

**Step 1: Sign into MxDataClient**

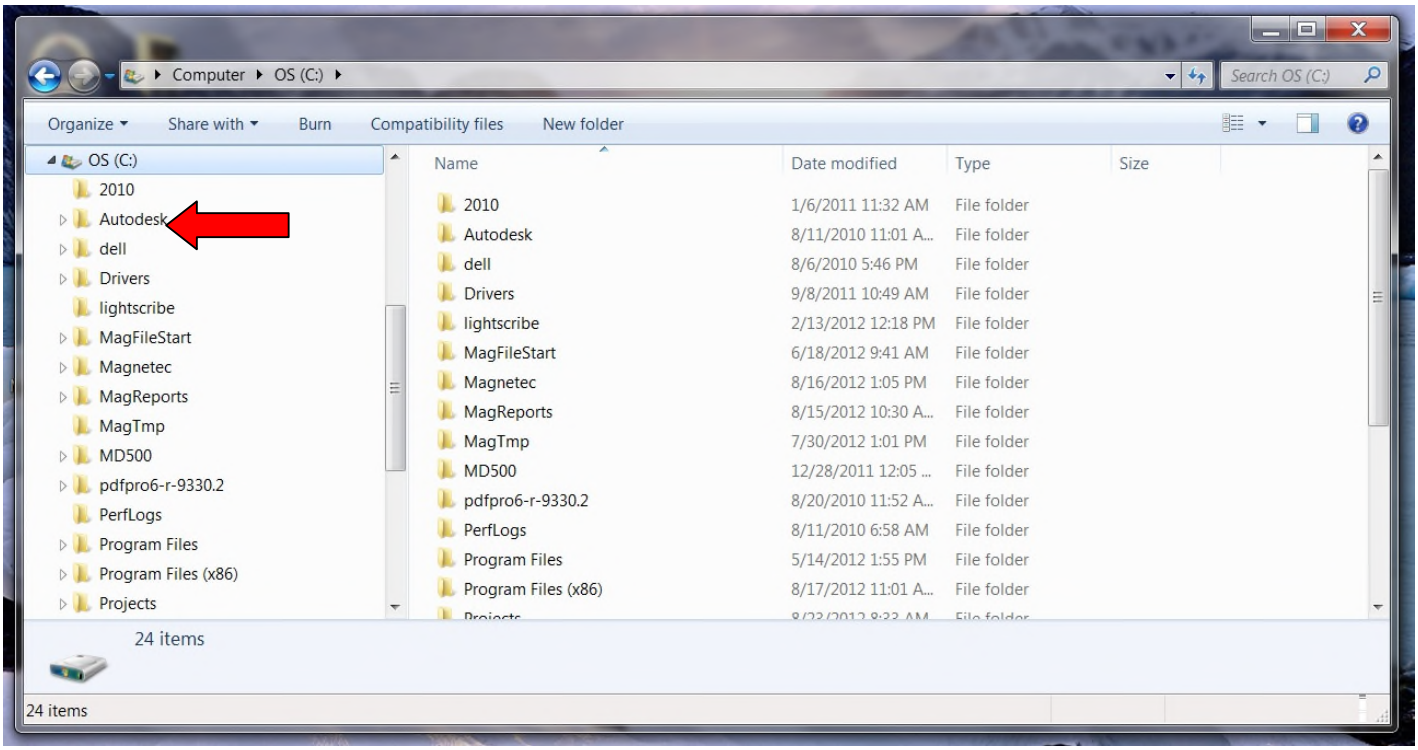



**Step 2: Click on the Tools tab**



## ***Uploading a Project to Server***

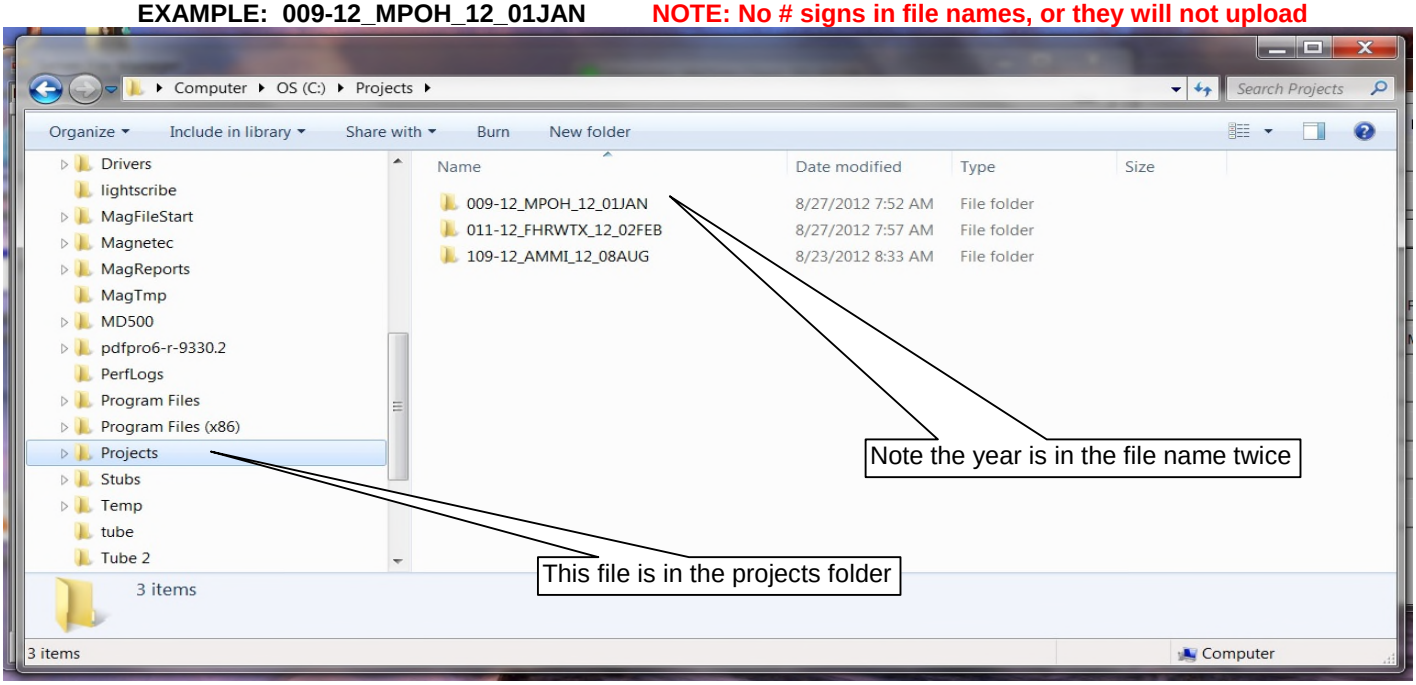
**Step 3: Create a folder on your C drive called Projects**




**Step 4: Place job folder into Projects folder**

**NOTE: The job must have the year in the file name twice**

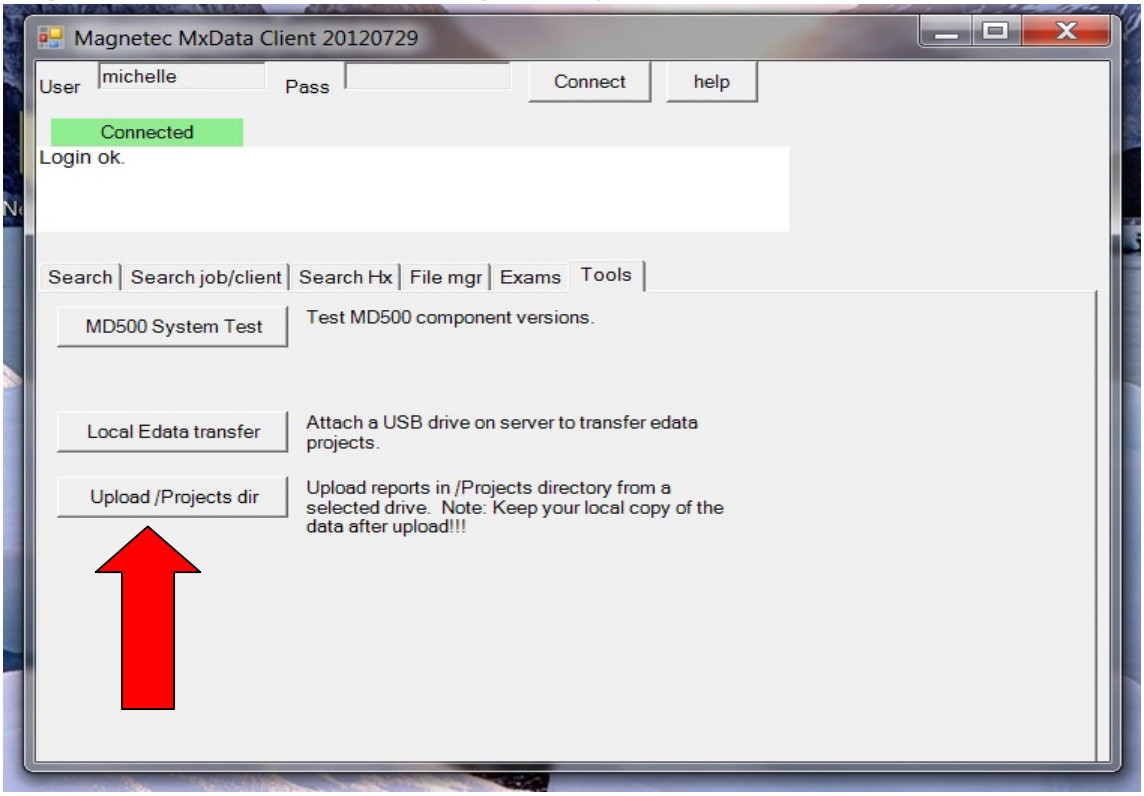
**EXAMPLE: 009-12_MPOH_12_01JAN** **NOTE: No # signs in file names, or they will not upload**



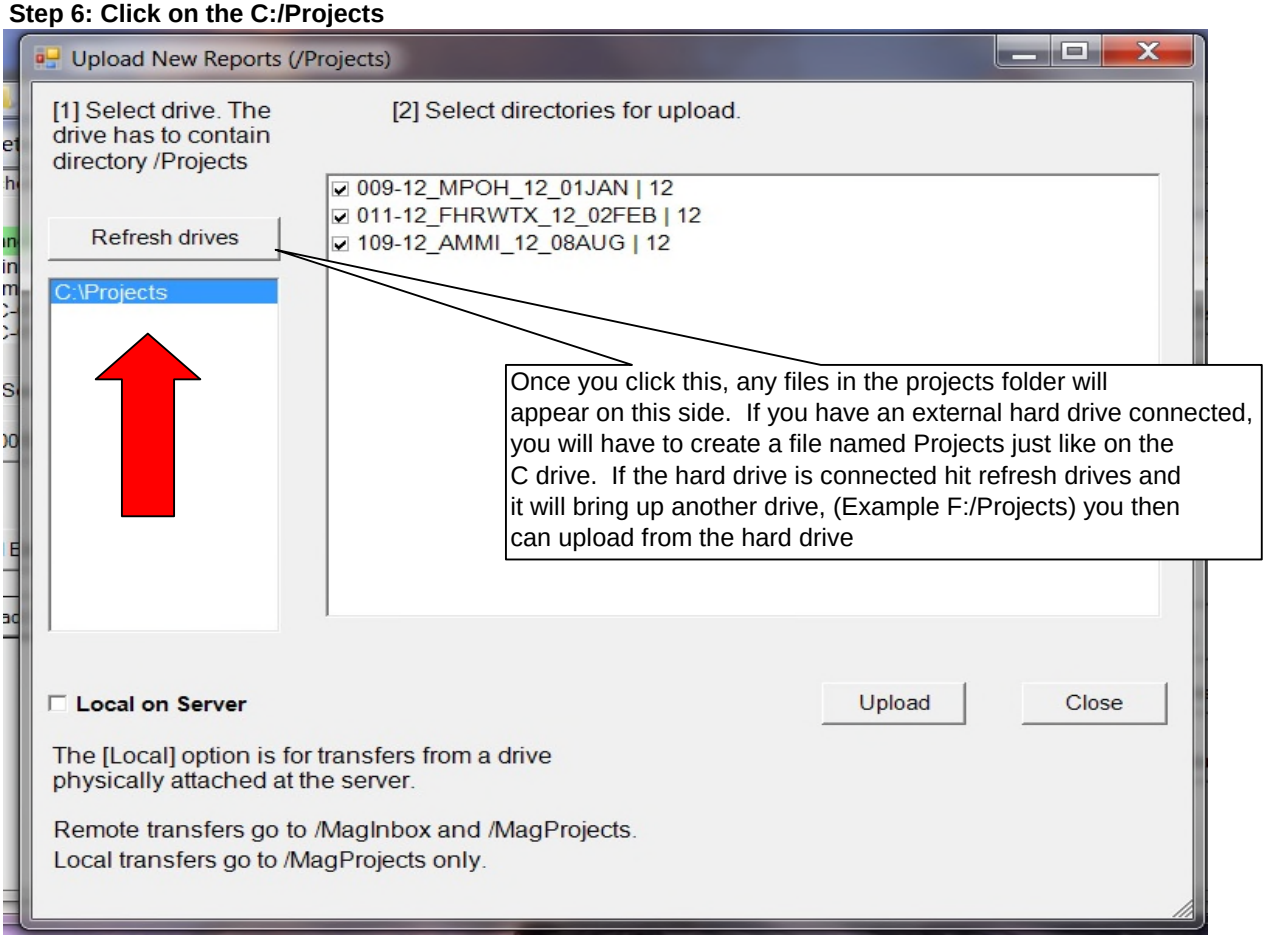

**NOTE: The file can not be in zip file format**

## Uploading a Project to Server

**Step 5: On the MxDataClient click the Upload/Projects dir button**



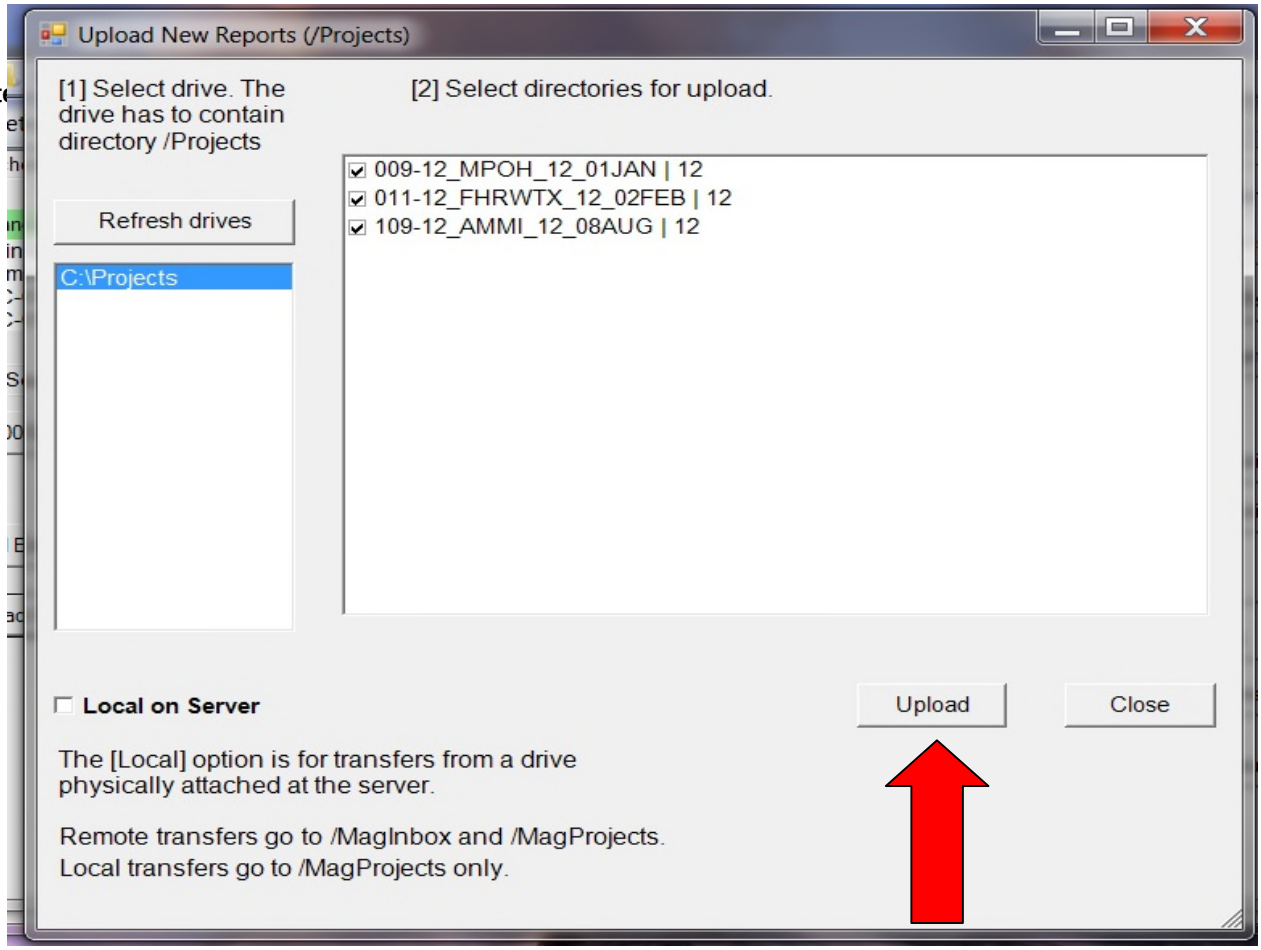

**Step 6: Click on the C:/Projects**



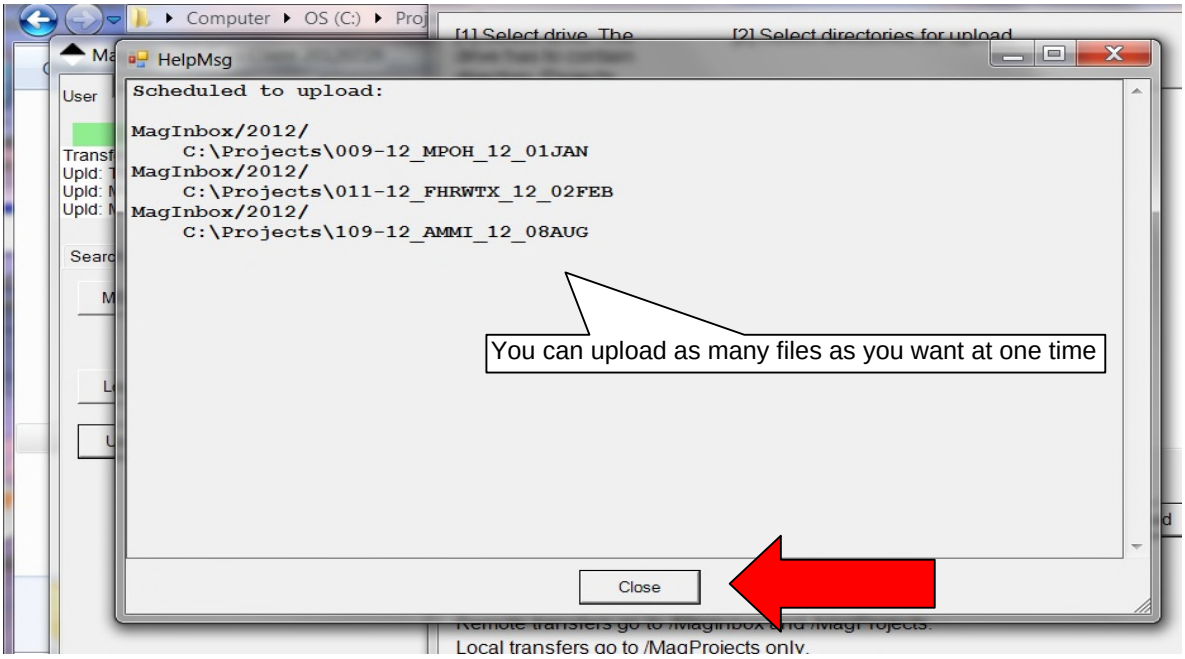

Once you click this, any files in the projects folder will appear on this side. If you have an external hard drive connected, you will have to create a file named Projects just like on the C drive. If the hard drive is connected hit refresh drives and it will bring up another drive, (Example F:/Projects) you then can upload from the hard drive

## ***Uploading a Project to Server***

**St**

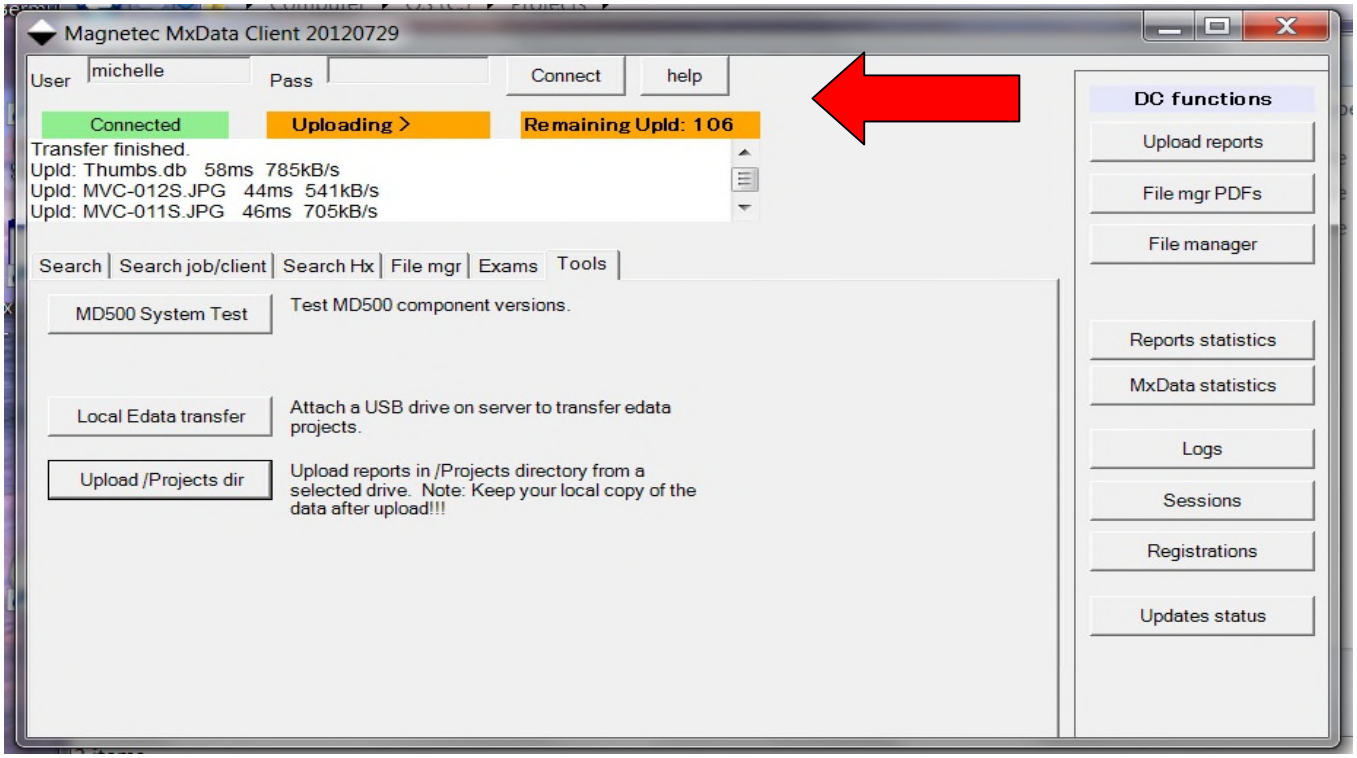



**Step 8: A box will appear and notify you that the files are being uploaded, click close**

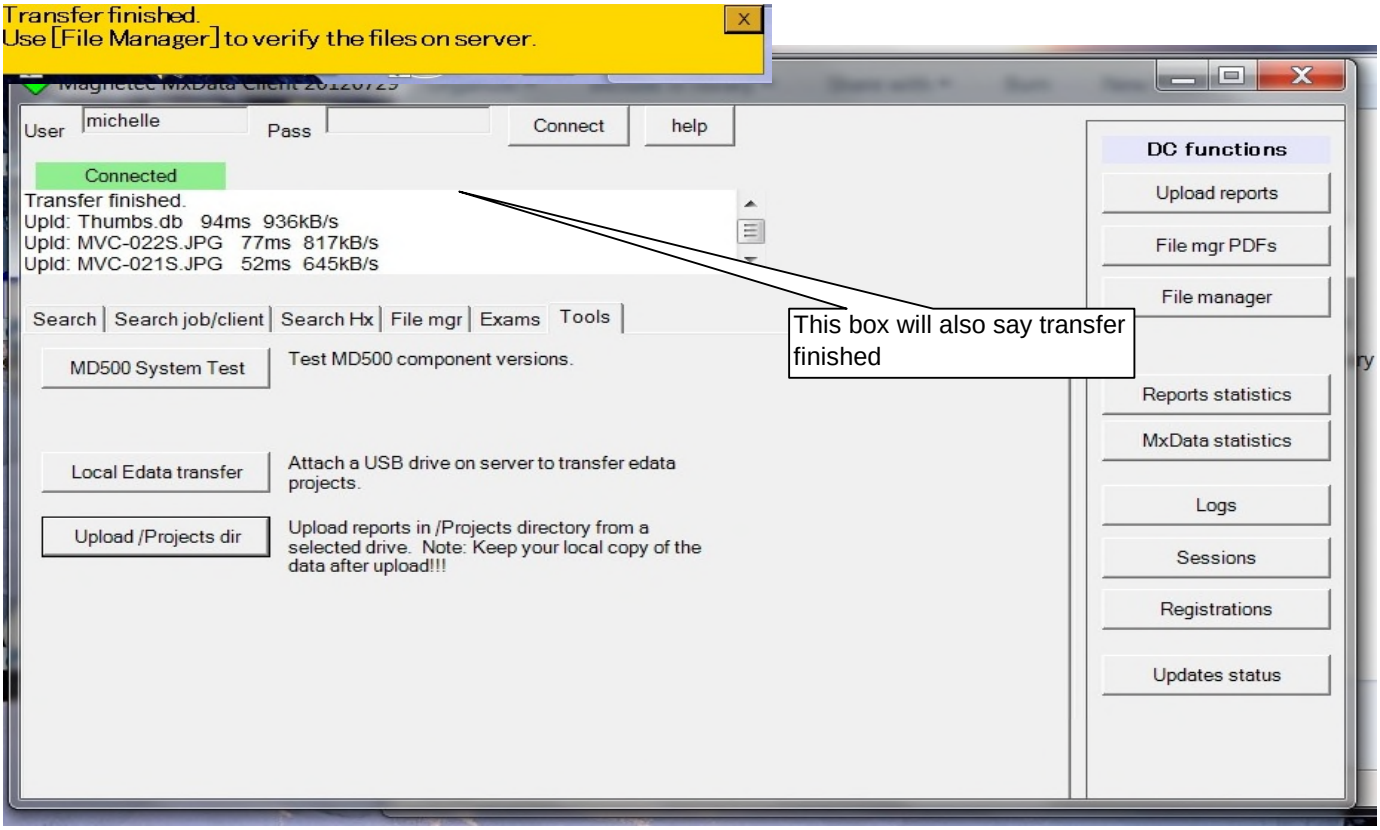


## Uploading a Project to Server

**Step 9: The orange boxes appear to let you know the file is uploading**



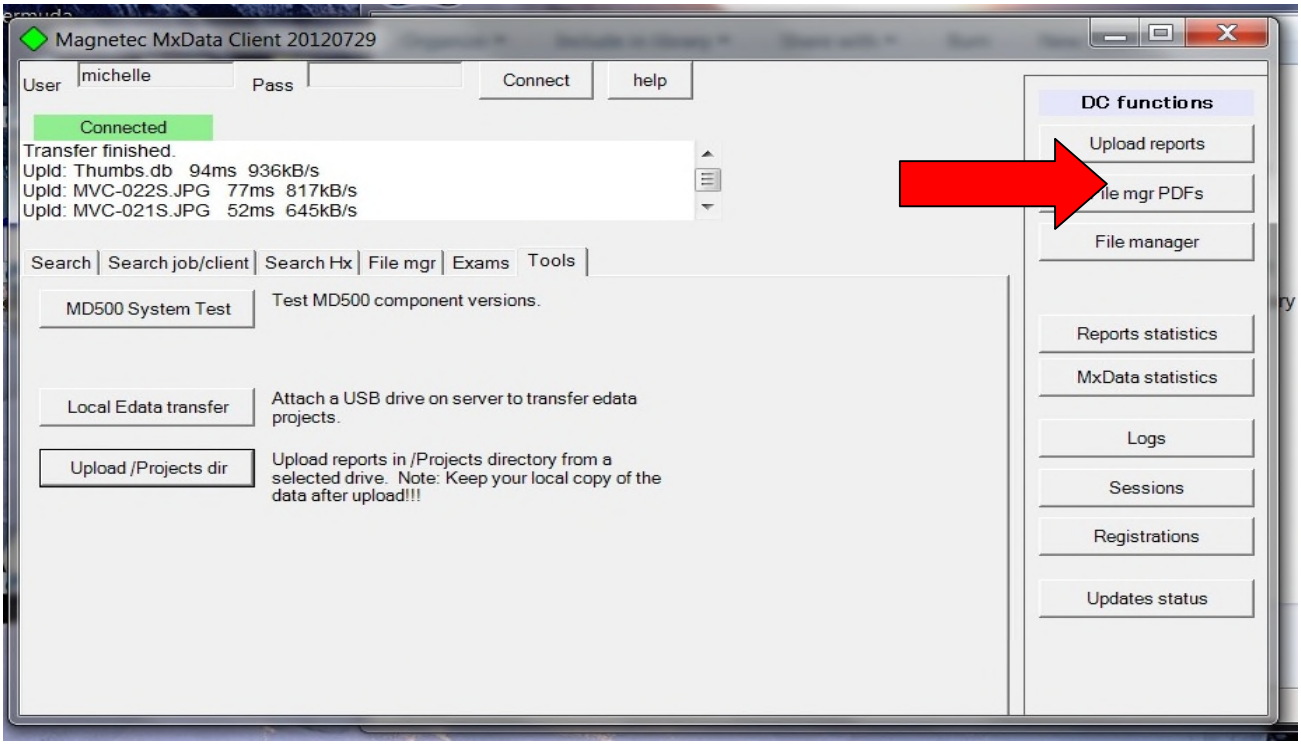

**Step 10:** **An orange box appears at the top of your screen to let you know the file transfer is complete**



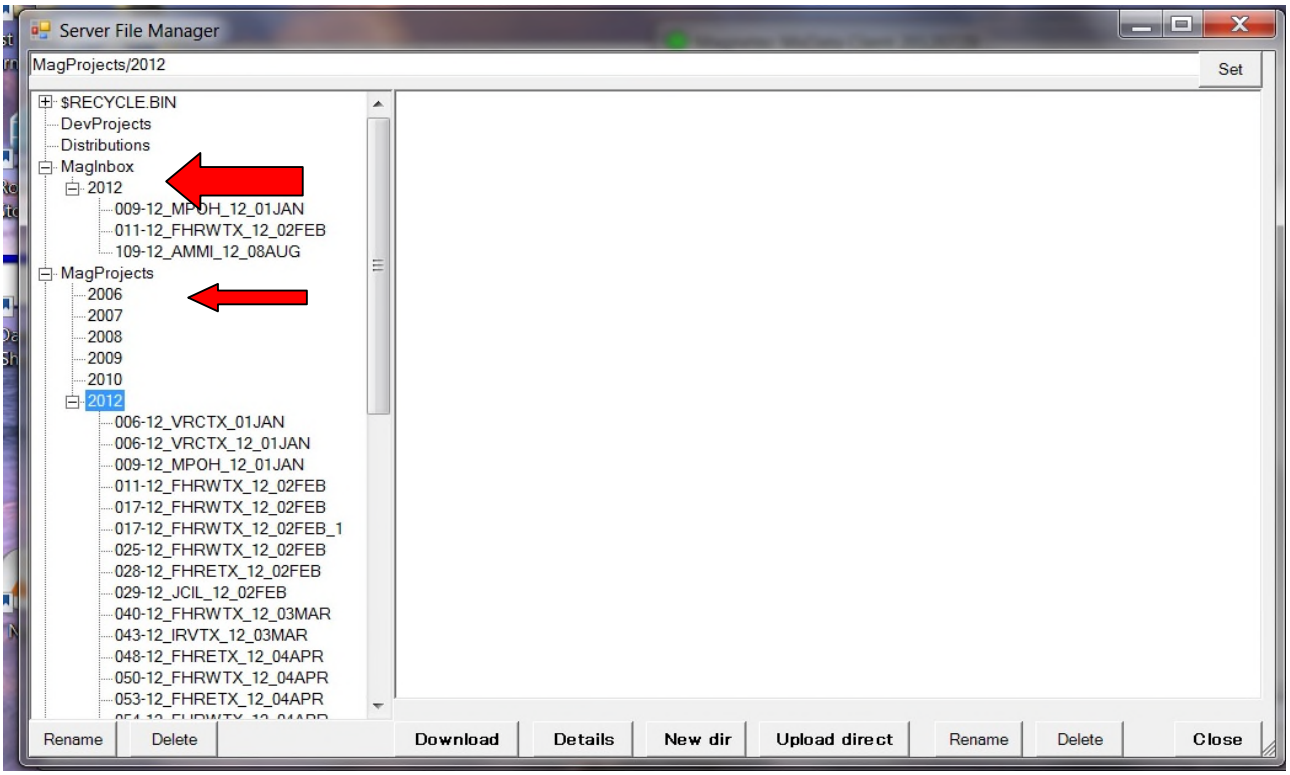
## ***Uploading a Project to Server***



**Step 11: Verify your files uploaded by clicking the File Manager button**




**Step 12: The files will go into the MagInbox folder and the MagProjects folder**




**You have now uploaded your files to the server.**

# Edata Transfer to Server

If you have not noticed the Edata transfer to the server over the wireless is slow with regard to large jobs.
Big jobs of 10 or more bundles with lots of files/storage space can take a long time to transfer so we made a transfer file manager that can be utilized directly from the server.

This program is located as a shortcut on the serer tabletop <<MxDataMgr>

The program is very easy to us.

1) When the program is started the main screen appears and you select the "source directory" for the files/projects in question. This would be a USB device where your files are.

2) The destination drive is always "E". This is where the files are going.

3) Hit "Scan for Eprjs". This will scan the disk for all Eprjs and list them in the upper large dialogue box.

4) Hit "Copy Eprjs". This will copy the projects into the "C/Mxdata" directory. The program will create all the specific directories, etc..

The two lower boxes will tell you what was copied. "Progress PASS" is files copied correctly. Progress FAIL is files not copied. These will have some form of file name problem. These will have to be corrected prior/after the file transfer process.

These problems could be any number of scenarios. Say you did a pre-transfer of Edata during the middle of a job (just to be safe with the data) and made a directory " First Transfer"
eg. F:/First Transfer/FHRWTX_1EA1_10_01JAN

This would not X-fer due to The "First Transfer" part of the file.

This program will make our lives easier. It is kind of a point, click and send.

Please make sure you upload your Edata from jobs you perform. It is you responsibility to get the data to the server.

You may have put the Edata on CD's for Data Central, however you must also upload this data.

You will need to get on the server and check on the data to confirm it went.
There is an option in MxDataClient where you can Transfer very large files (25 Meg+).

In MXDataClient go to tools - Document Transfer.

In the screen you will see area to upload file, download file, password/code, and list of who to send to.

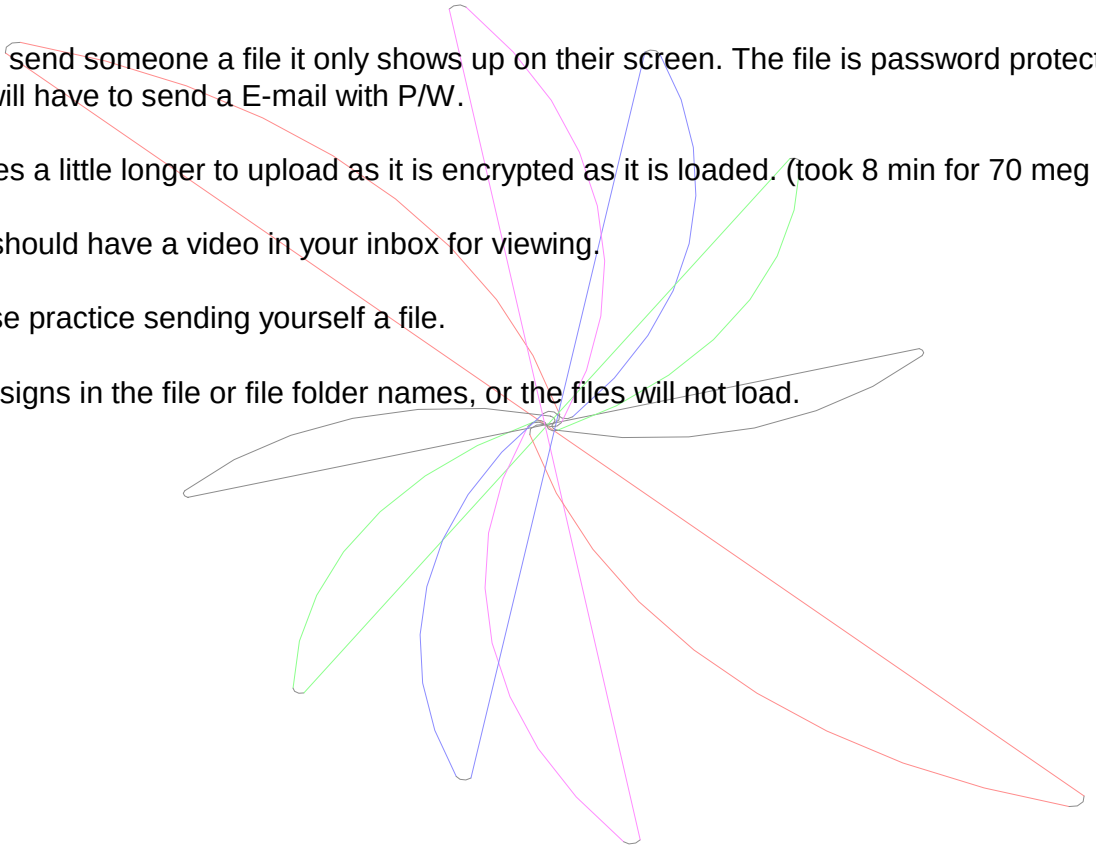
If you send someone a file it only shows up on their screen. The file is password protected so you will have to send a E-mail with P/W.

It takes a little longer to upload as it is encrypted as it is loaded. (took 8 min for 70 meg file)

You should have a video in your inbox for viewing.

Please practice sending yourself a file.

No # signs in the file or file folder names, or the files will not load.

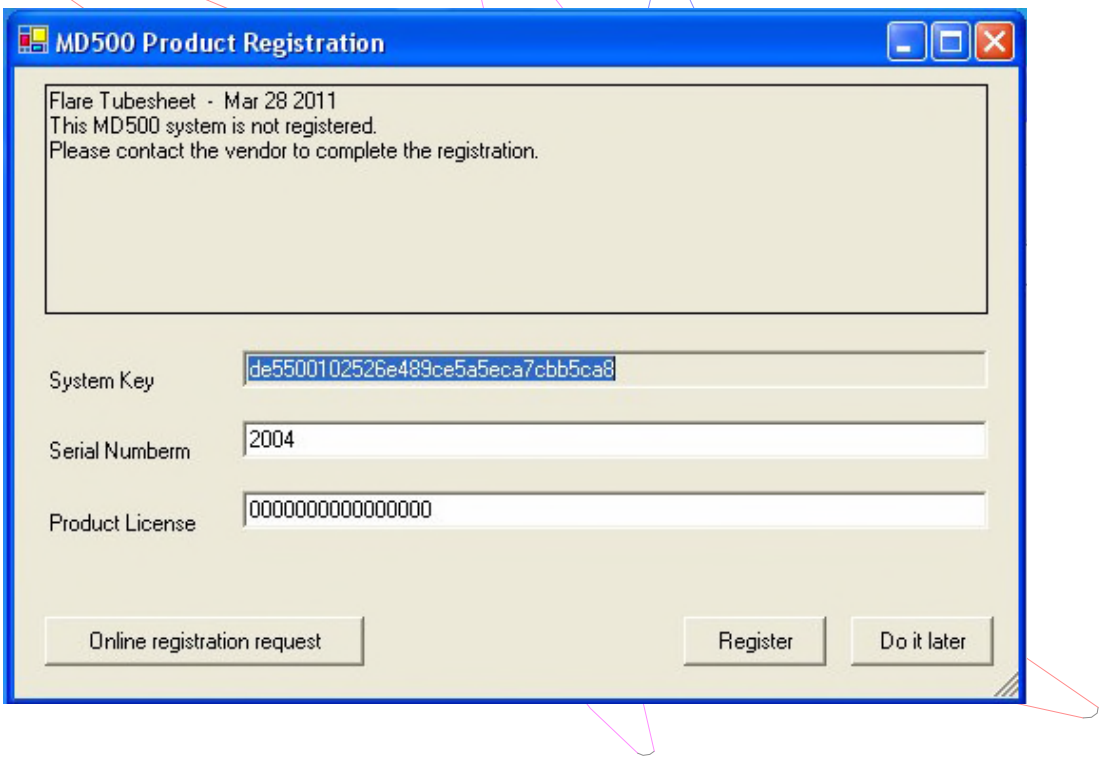


# Product Registration

So, you know when your machine Times out / or you didn't get your timekey entered when you should have, and you go to open your MD500 or Flare tubesheet, and the little box (below) pops up. Here are the steps you need to take to get yourself up and running again.

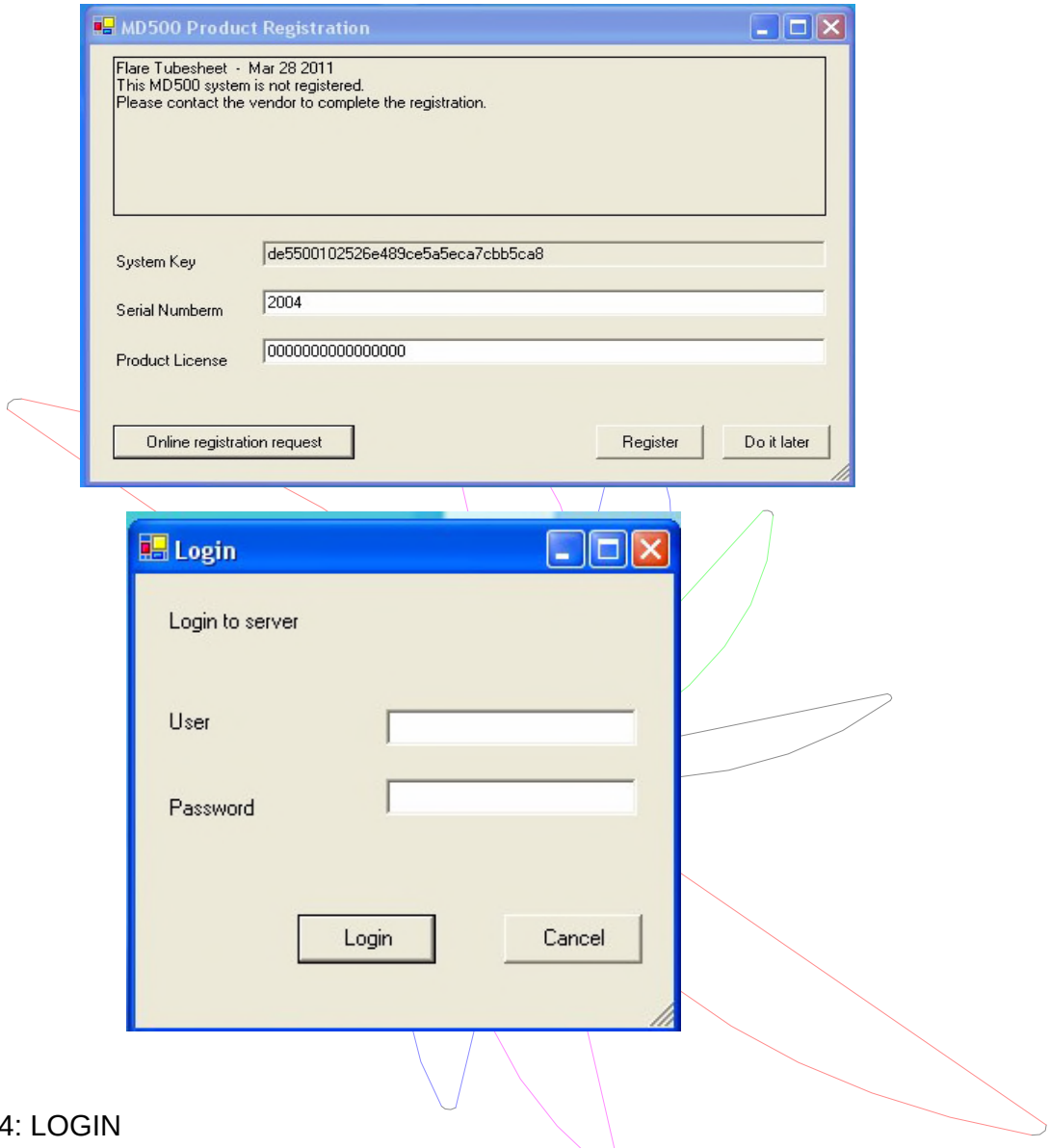
STEP #1 MAKE SURE YOUR DATE AND TIME ARE CORRECT ON YOUR MACHINE!!!!!!!!!!!!!!!!!!!!!!!!! THIS IS VERY IMPORTANT!!! IF IT IS WRONG, THEN CORRECT IT!!!!

STEP #2 Open the program you choose to use
Then this box will pop up:

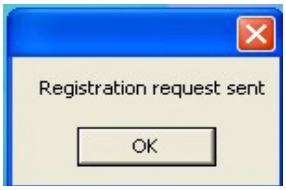



STEP #3 You want to click the button that says:“**Online Registration Request**”

Once you click on the "Online Registration Request", a login box will pop up. This is your login that you would use for the MxDataClient. (See below)

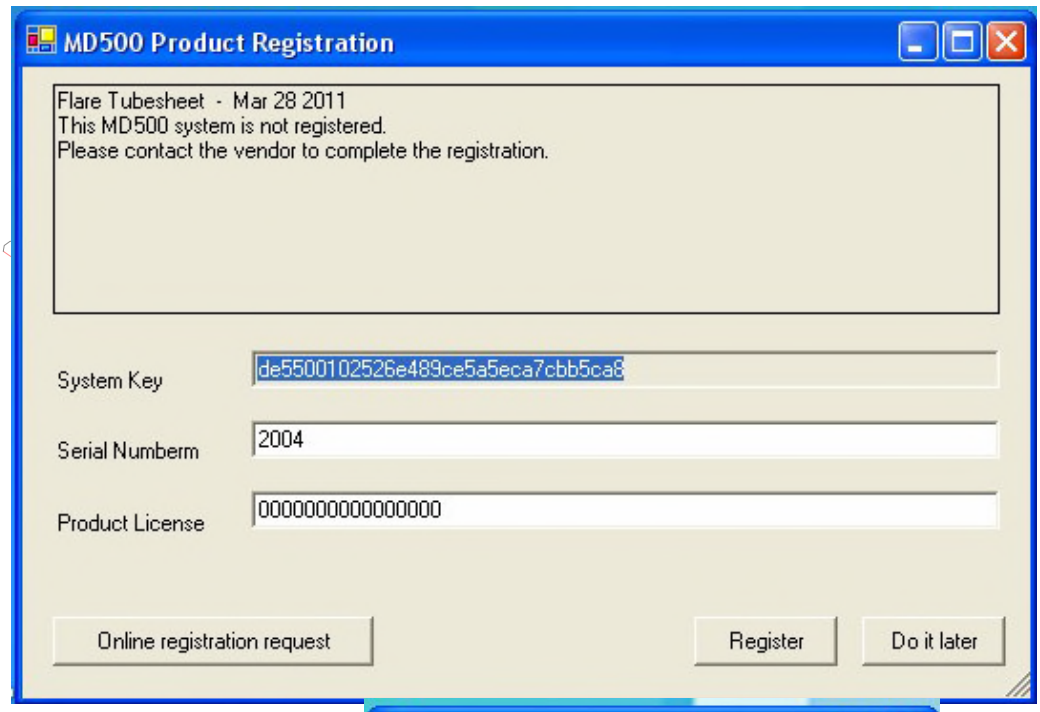


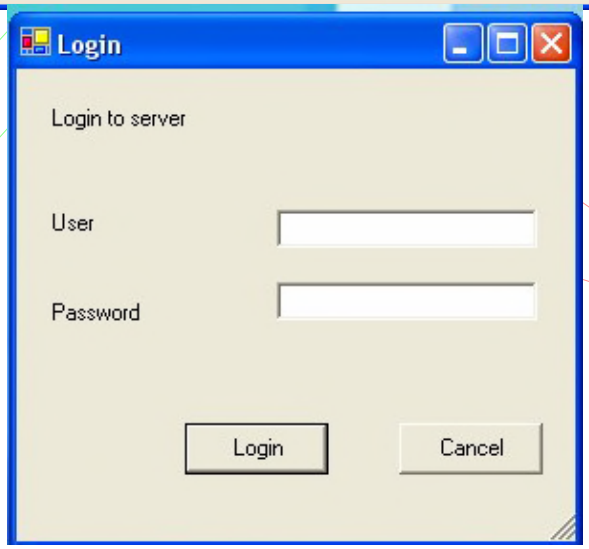

STEP #4: LOGIN
You will then see the cute little box below: CLICK OK




At this point, just close out everything. And….
STEP #5 You need to call Ethan or Michelle. These are the only two people who CAN approve your registration! If you get their voicemail, simply say, "This is ( ), I sent in a registration request, could I get that approved please?"

STEP #6 After you know it is approved; try to open the program again. The same box will pop up, and you need to, once again, click on“Online Registration Request”Then Login again

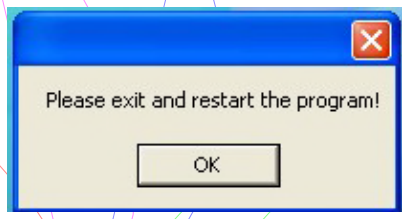



You will see the following:
STEP #7 CLICK OK

STEP#8 CLICK REGISTER


You will then see the following:
STEP #9 CLICK OK

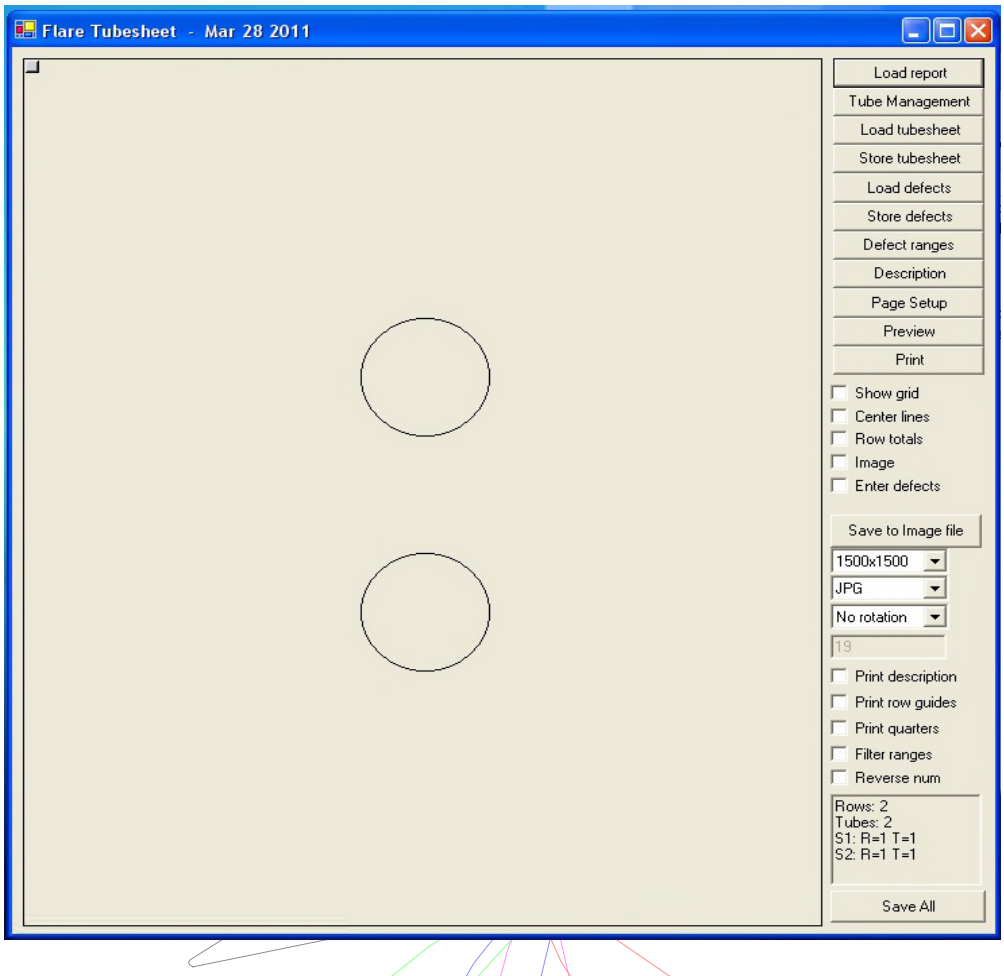



Yeah, so……exit the Program……
STEP #10 Reopen your program, you will see the following:


This is the 5 digit activation code
(Timekey), which Ethan sends out, approximately every 3 months.

STEP #11
Enter the correct 5 digit code and click ok……

VA VA VOOM–YOU ARE BACK IN BUSINESS MY FRIEND!!




NOTE: When a Timekey is sent to you, it is not to be forgotten about. There is a time-frame we all have, which we have to key in the TIMEKEY. It could be a month or it could be a week. Your best bet is to key it in, on the expiration date of the old timekey. (Normally, we are all told when it will expire) So if you are at home, and you get an email, which says"timekeys will expire tomorrow, here are the new ones…."Well then tomorrow, you need to get every one of you machines out, and put in the new codes. This new system may seem so simple but still, Ethan or Michelle still have to drop what they are doing, to approve your registration. So try to keep up on this. It doesn't take too much time to key these in.

# Report Review Bucket

Per conversations with our people it was mentioned that it would be nice to be able to go to a place to get reports (without searching our entire report database) which really highlight a specific corrosion mechanism or failure mode.

Our discussions have led us to the "Report Review Bucket". This is a directory which can be found on the server.

Log onto server through - MXDataClient

Go to - Magreports_PDF and Report Review Bucket

There you will find many categories with files of choice that have specified corrosion. Say "Cracking"

Download these as usual for your review. They will download into:

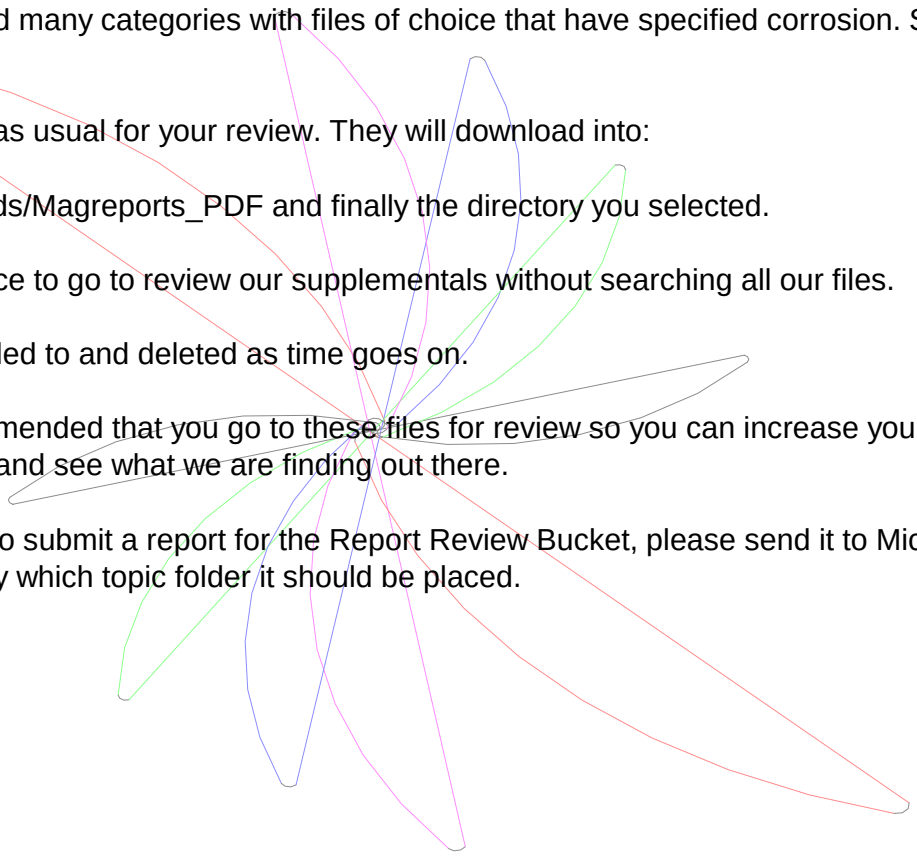
MD500/Downloads/Magreports_PDF and finally the directory you selected.

This is a nice place to go to review our supplementals without searching all our files.

These will be added to and deleted as time goes on.

It is highly recommended that you go to these files for review so you can increase your knowledge base and see what we are finding out there.

If you would like to submit a report for the Report Review Bucket, please send it to Michelle Eaker and specify which topic folder it should be placed.



# MIApp

Magnetec presents its new Report App: MIApp, which will aid in tracking our reporting process.

Once added to our distribution list, you will receive a notice of issued reports / updates on your smart devices via email.

The app will allow you to track the job via smart phone or computer platform.

The App will present the information in our usual "Status" format with all reports being accessible by following the report tab.

All report formats will be available including:

Summary reports
IWR - Inspection work requests.
Additional photos
Discussions (failure analysis, removed samples, corrosion mitigation, etc..)
HX summary

The App make reports available at any time to our clients through their smart devices and will be retained on the App for 1 year and then are archived to our server block. This allows our clients to gather mis-placed reports at any time. The App also presents the current status of job completion.

Client meetings will have up to date information available at a moments notice or can be viewed during the meeting by conventional computer/projector means.

Clients corporate members can have access to all active and archived jobs via the App platform.

Now every member on the inspection team can have access to the reporting process.

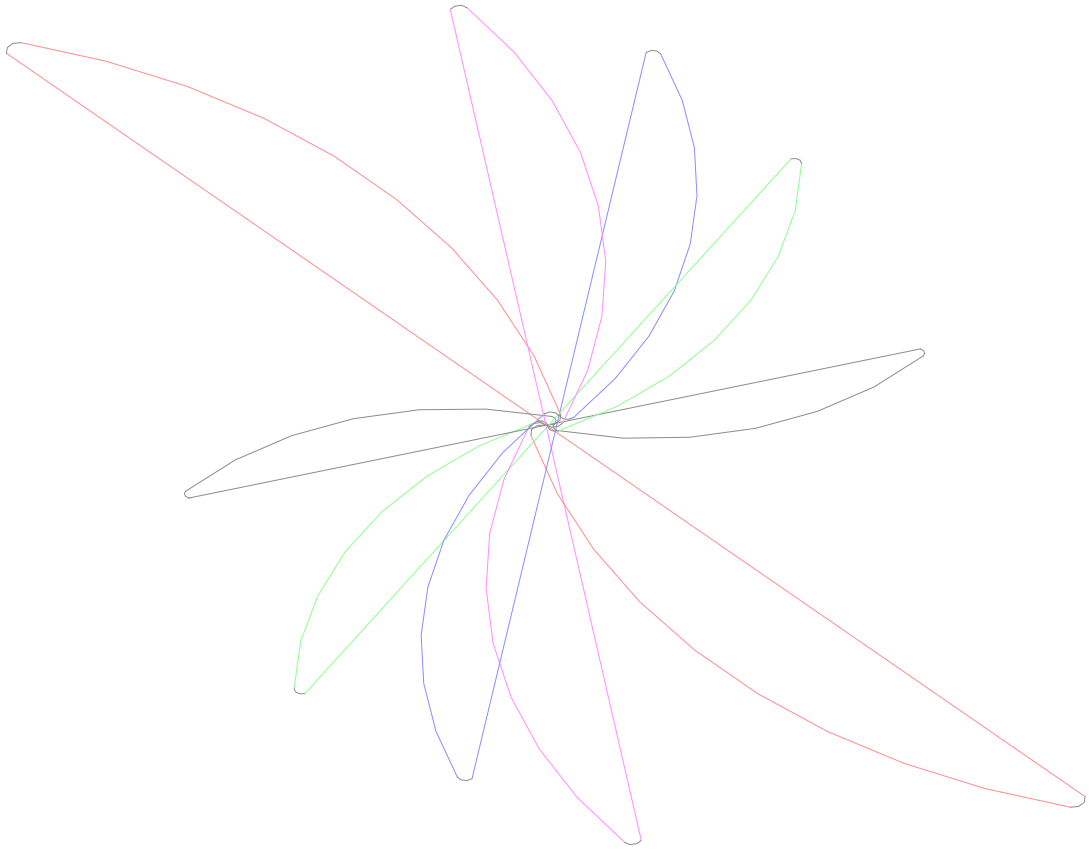
No # signs in the file names or they will not load into the app.

To access the APP, you will navigate to **www.magnetecreports.com** in your web browser.

You must be manually added by Data Central before you can access the site. If you have problems logging in with your magnetec email address and the password **mag3757**, please contact Data Central.

Once you are added you will recieve a notification email letting you know you have access, and you can access the site via the link in the email.

There has been a detailed User Manual Prepared for use of MIApp. Please contact Ethan for a copy of the Manual.



# Safety Tracking Form

Safety training will occur at several different safety councils and job sites.

To track where and when you took a safety class, there is a safety tracking form.

The safety tracking form is a living document. To update it, you will look to see who emailed it last.

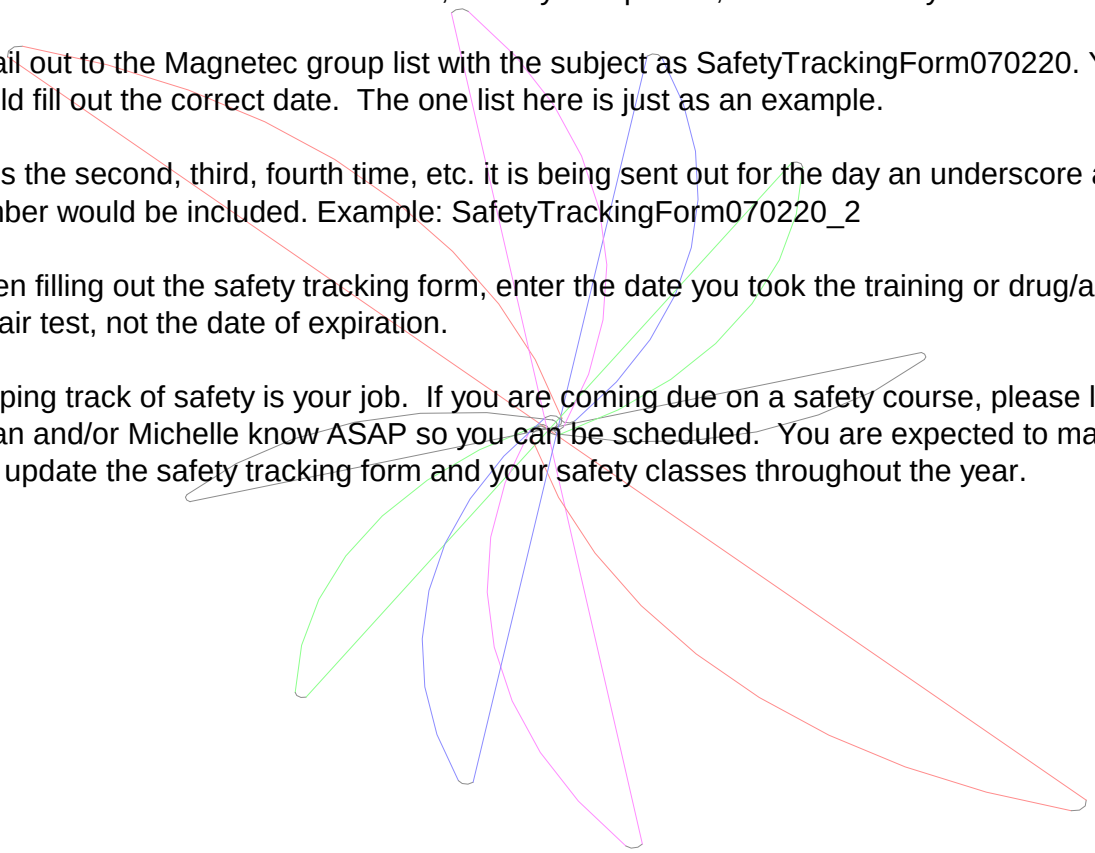
Then download the most recent form, make your updates, save with today's date.

Email out to the Magnetec group list with the subject as SafetyTrackingForm070220. You would fill out the correct date. The one list here is just as an example.

If it is the second, third, fourth time, etc. it is being sent out for the day an underscore and the number would be included. Example: SafetyTrackingForm070220_2

When filling out the safety tracking form, enter the date you took the training or drug/alcohol or hair test, not the date of expiration.

Keeping track of safety is your job. If you are coming due on a safety course, please let Ethan and/or Michelle know ASAP so you can be scheduled. You are expected to maintain and update the safety tracking form and your safety classes throughout the year.



# Photos

The photos taken should make a full representation of the bundle in question.

The photos taken should show a sample of all damage that is documented in the report.

The photos taken should document and highlight the corrosion in the bundle. Do not report corrosion and have no photo of it.

Photos are to be in focus.

Photos are an aid in the reporting process to help the plant personnel in visual context to the verbal information in the report.

Photos have to have some meaning. Not just a bunch of photos of randomness.

Your camera needs to be working. Please confirm you have a camera that works.

If you are with an employee who can not take photos then don't let him.

Angled photos.

A recent review of reports have many angled photos of the bundle. As an example these would be photos of the tube sheet that has the photo angled from the gasket area across the tube sheet face. Another example would be of tube end corrosion that is from the side of the tube across the flat plane of the tube end. We have whole reports with angled photos of corrosion which have not fully displayed/captured the full depth of the defect. We fully understand that a specific inspection with corrosion type may require different photo angles and this is a function of the corrosion type and defect depth. Your major objective when photo documenting a bundle is to capture photos that best display/capture/document the corrosion.

Angled photos may not capture the corrosion to the highest degree and are at oblique angles to the corrosion depth. In all cases while taking photos of corrosion there should be a photo that is 90 degrees or perpendicular to the defect with the defect depth being of prime importance in the photo. An angled photo of corrosion does not truly show the defect depth and has tendency of making distance fade into the photo panorama.

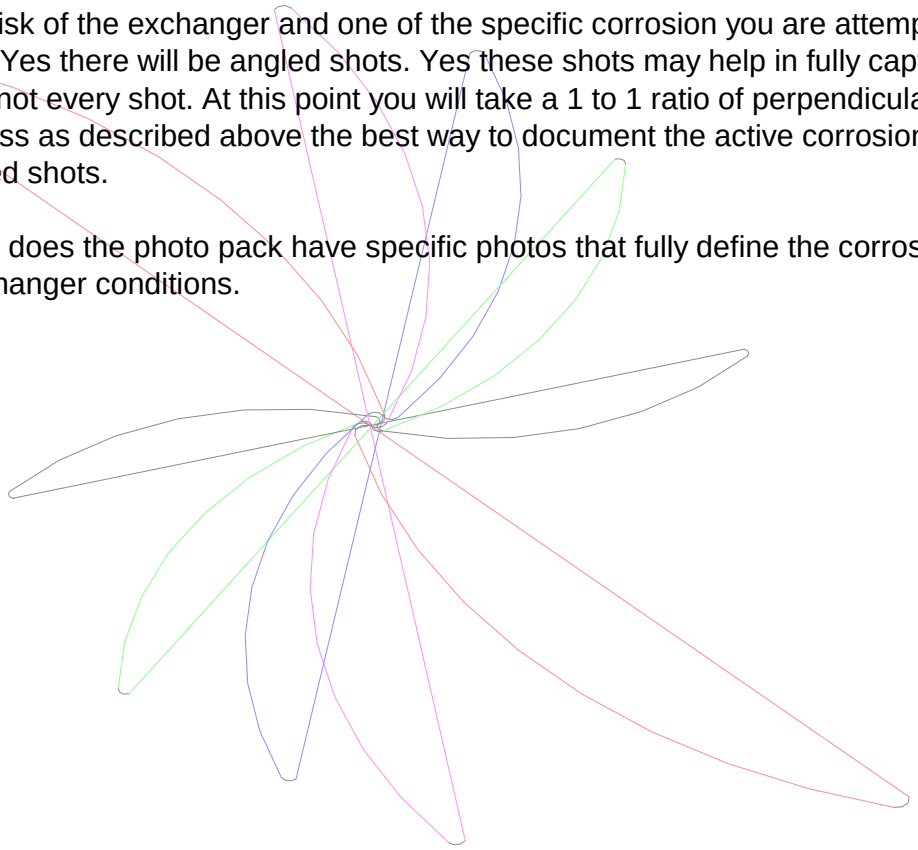
Remember that the area very close to the lens or localized areas will be in focus but areas that extend away from the lens in an angled shot has less and less clarity the further away they are from the lens.

Certainly if you are taking photos of corrosion on the tube sheet the best way to capture depth is an angled shot from the edge across the face or tube end corrosion on the O.D. extension are best captured by an angled shot.

O.D. corrosion is not captured very well by an angled shot. This shot is best at 90 degrees to the tube surface and defect. You can assume that if you are attempting to capture corrosion there will be many photo multiples of the corrosion and a few will be angled shots. Angled shots would tend to show general location and/or extent of corrosion but may not be best to display the depths of the defect. Again a specific defects depth would be best displayed by a shot at 90 degrees and/or very close to perpendicular to the defect depth.

Take one photo disk of the exchanger and one of the specific corrosion you are attempting to capture. OK, OK, Yes there will be angled shots. Yes these shots may help in fully capturing the corrosion but not every shot. At this point you will take a 1 to 1 ratio of perpendicular to angled shots unless as described above the best way to document the active corrosion would be only with angled shots.

The bottom line is does the photo pack have specific photos that fully define the corrosion or even general exchanger conditions.



# In shell Photos

1. FIXED TUBESHEET
   a. The entire tubesheet should be in frame, and the top orientated to the top of the photo.
   b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).

2. GASKET SURFACE ON FRONT OF FIXED TUBESHEET (If channel head has been removed)
   a. Photo should be of a section that represents the condition of the gasket surface.
3. PASS PARTITION GROOVES OF FIXED TUBESHEET
   a. Represent the overall condition of the grooves (Is there corrosion? Mechanical damage?).

4. TUBE ENDS OF FIXED TUBESHEET
   a. Tube layout (square pitch, triangle pitch)
   b. Overall condition of tube ends (Is there corrosion? Erosion? Mechanical damage?)

5. ROLL AREAS OF FIXED TUBESHEET
   a. I.D. of tube.
   b. Take a couple photos.
   c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
   d. Use a light source if needed (flashlight, mirror)
   e. Use caliper/micrometer in photo if necessary to convey information.

6. STAMPING ON EDGE OF TUBESHEET
   a. Item #, tubesheet material, serial number, date of installation, etc.
   b. Angle light source to cast a shadow if necessary

7. SERIAL TAGS & INFORMATION PLATES
   a. Serial number, Nat'l Board #, design pressures, design temp., type, etc.
   b. Angle light source to cast a shadow if necessary

8. ENTIRE EXCHANGER FROM FRONT VIEW
   a. Try to represent shell type and design
   b. Try to represent any inlet/outlet piping.

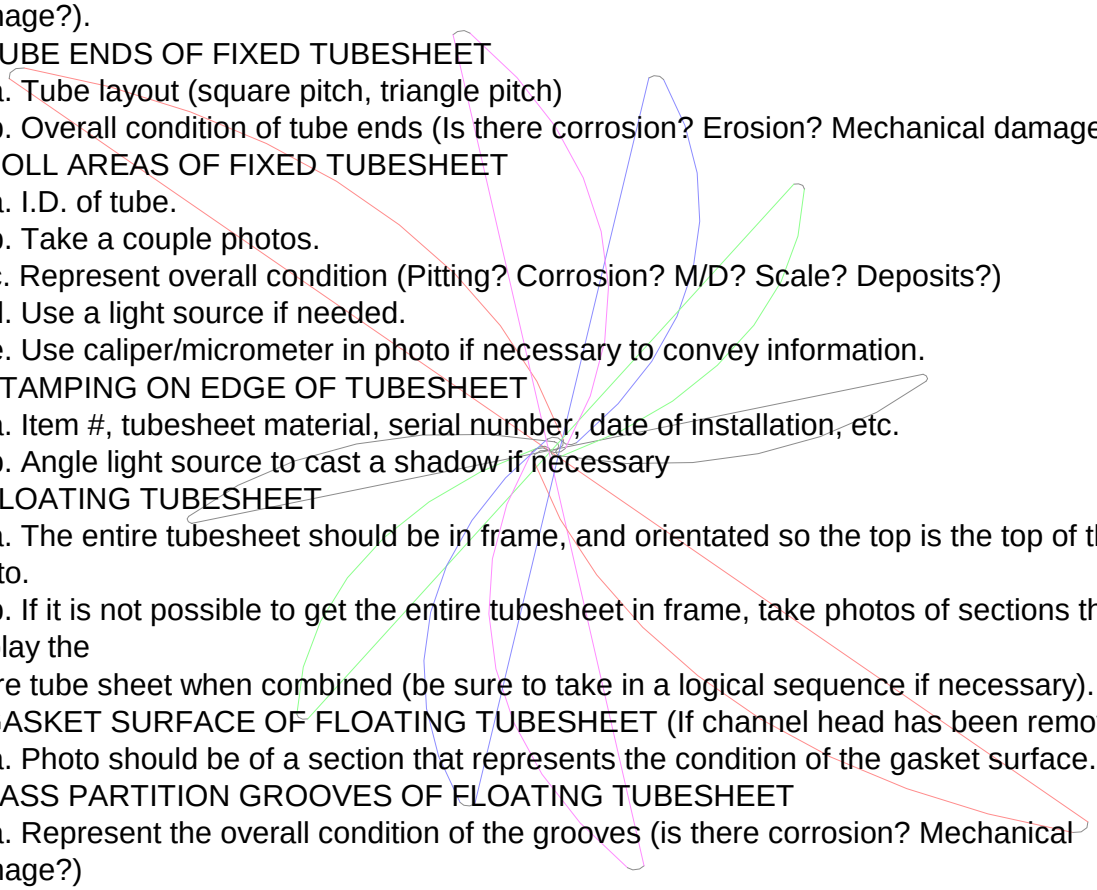
9. ENTIRE EXCHANGER FROM REAR VIEW
   a. Try to represent shell type and design
   b. Try to represent any inlet/outlet piping.

10. Photos of any corrosion, wall losses, mechanical damages, or other adverse conditions to any tubing or component that will be noted in the report.

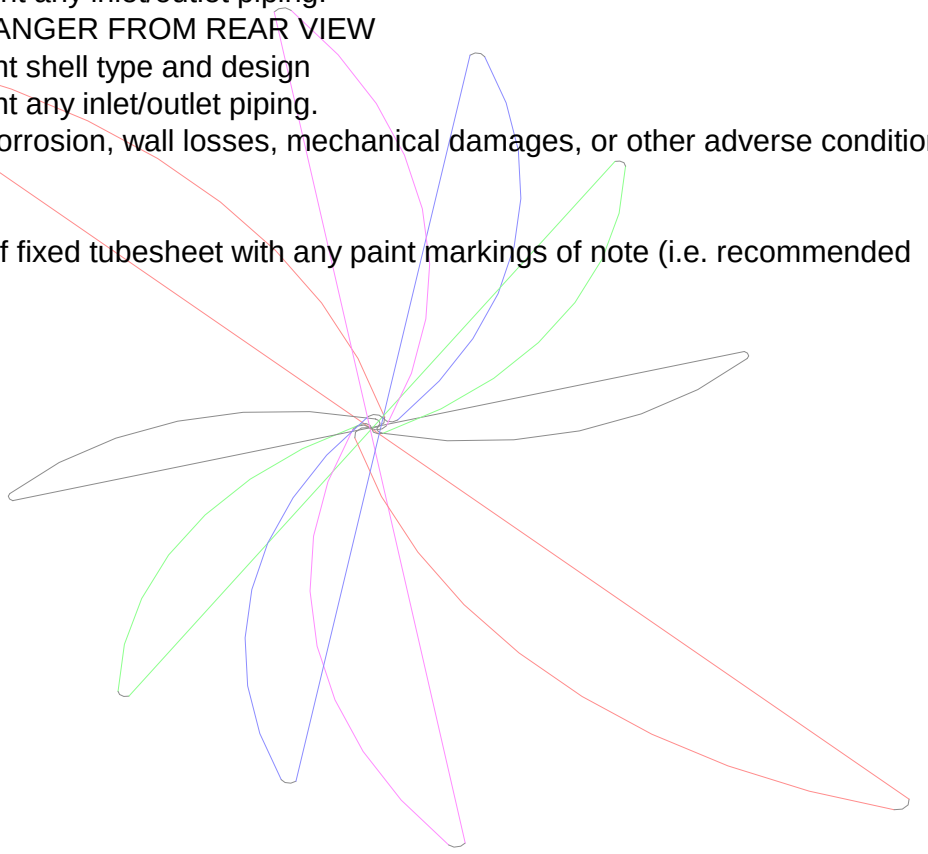
11. Second photo of Fixed tubesheet with any paint markings of note (i.e. recommended plugs) if applicable.

# In Shell Photos with Floating Head

1. FIXED TUBESHEET
    a. The entire tubesheet should be in frame, and the top orientated to the top of the photo.
    b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).
2. GASKET SURFACE ON FRONT OF FIXED TUBESHEET (If channel head has been removed)
    a. Photo should be of a section that represents the condition of the gasket surface.
3. PASS PARTITION GROOVES OF FIXED TUBESHEET
    a. Represent the overall condition of the grooves (Is there corrosion? Mechanical damage?).
4. TUBE ENDS OF FIXED TUBESHEET
    a. Tube layout (square pitch, triangle pitch)
    b. Overall condition of tube ends (Is there corrosion? Erosion? Mechanical damage?)
5. ROLL AREAS OF FIXED TUBESHEET
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
    e. Use caliper/micrometer in photo if necessary to convey information.
6. STAMPING ON EDGE OF TUBESHEET
    a. Item #, tubesheet material, serial number, date of installation, etc.
    b. Angle light source to cast a shadow if necessary
7. FLOATING TUBESHEET
    a. The entire tubesheet should be in frame, and orientated so the top is the top of the photo.
    b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the
entire tube sheet when combined (be sure to take in a logical sequence if necessary).
8. GASKET SURFACE OF FLOATING TUBESHEET (If channel head has been removed)
    a. Photo should be of a section that represents the condition of the gasket surface.
9. PASS PARTITION GROOVES OF FLOATING TUBESHEET
    a. Represent the overall condition of the grooves (is there corrosion? Mechanical damage?)
10. TUBE ENDS OF FLOATING TUBESHEET
    a. Tube layout (square pitch, Triangle pitch)
    b. Overall condition of tube ends (is there corrosion? Erosion? Mechanical damage?)
11. ROLL AREAS OF FLOATING TUBESHEET
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
    e. Use caliper in photo if necessary to convey information.
12. SERIAL TAGS & INFORMATION PLATES
    a. Serial number, Nat'l Board #, design pressures, design temp., type, etc.
    b. Angle light source to cast a shadow if necessary

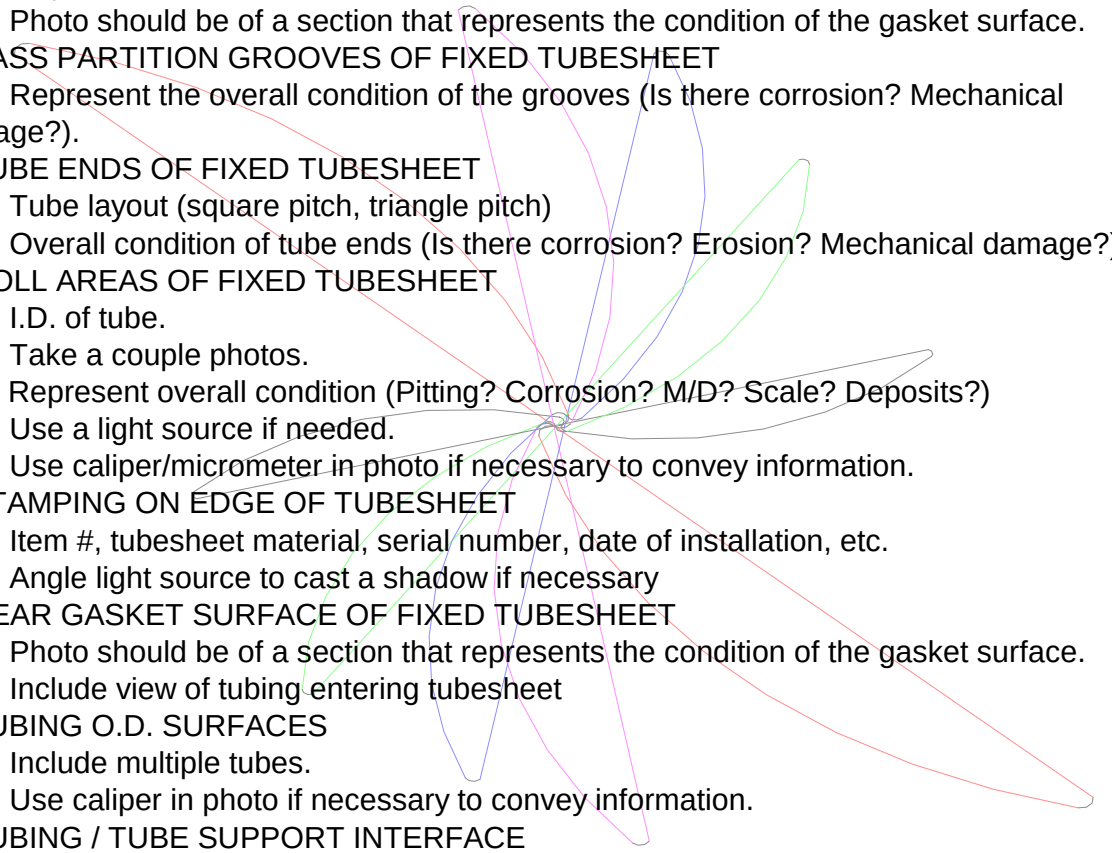


13. ENTIRE EXCHANGER FROM FRONT VIEW
    a. Try to represent shell type and design
    b. Try to represent any inlet/outlet piping.
14. ENTIRE EXCHANGER FROM REAR VIEW
    a. Try to represent shell type and design
    b. Try to represent any inlet/outlet piping.
15. Photos of any corrosion, wall losses, mechanical damages, or other adverse conditions that will be noted in the report.
16. Second photo of fixed tubesheet with any paint markings of note (i.e. recommended plugs).

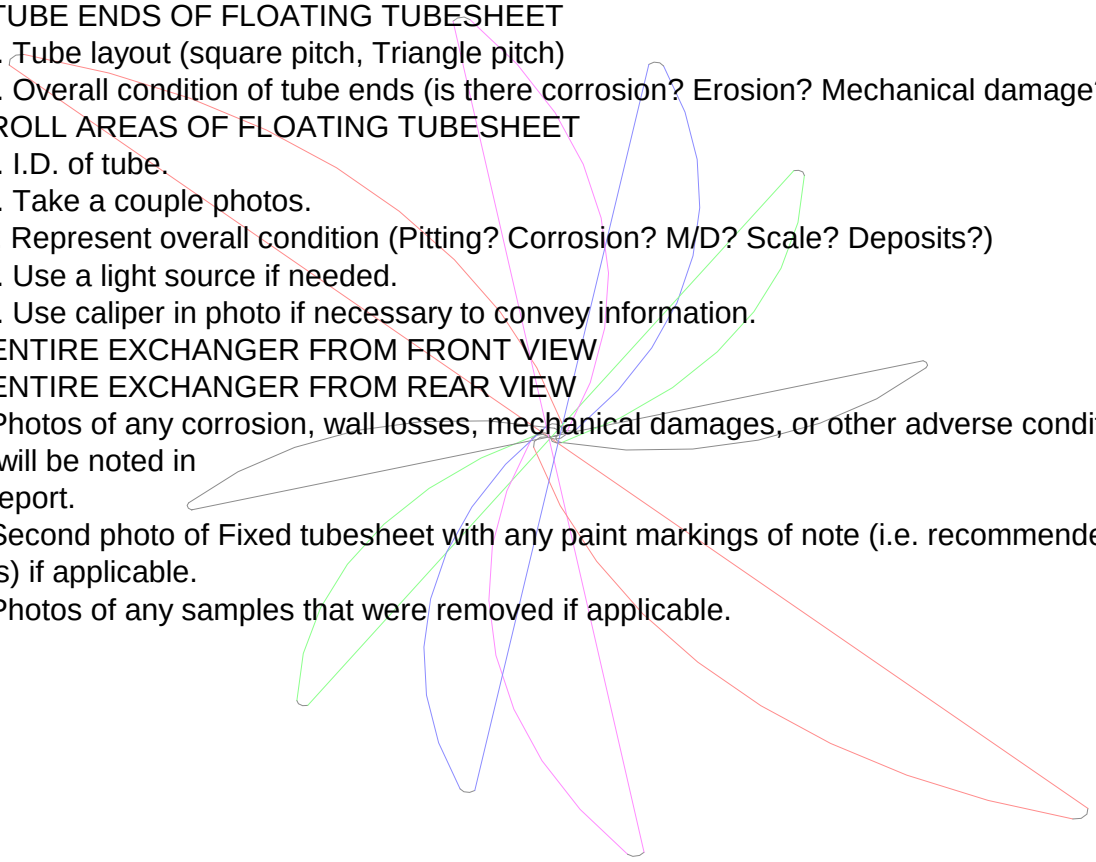


# Straight Tube Bundle (Out of Shell)

1. FIXED TUBESHEET
    a. The entire tubesheet should be in frame, and the top orientated to the top of the photo.
    b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).
2. GASKET SURFACE ON FRONT OF FIXED TUBESHEET (If channel head has been removed)
    a. Photo should be of a section that represents the condition of the gasket surface.
3. PASS PARTITION GROOVES OF FIXED TUBESHEET
    a. Represent the overall condition of the grooves (Is there corrosion? Mechanical damage?).
4. TUBE ENDS OF FIXED TUBESHEET
    a. Tube layout (square pitch, triangle pitch)
    b. Overall condition of tube ends (Is there corrosion? Erosion? Mechanical damage?)
5. ROLL AREAS OF FIXED TUBESHEET
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
    e. Use caliper/micrometer in photo if necessary to convey information.
6. STAMPING ON EDGE OF TUBESHEET
    a. Item #, tubesheet material, serial number, date of installation, etc.
    b. Angle light source to cast a shadow if necessary
7. REAR GASKET SURFACE OF FIXED TUBESHEET
    a. Photo should be of a section that represents the condition of the gasket surface.
    b. Include view of tubing entering tubesheet
8. TUBING O.D. SURFACES
    a. Include multiple tubes.
    b. Use caliper in photo if necessary to convey information.
9. TUBING / TUBE SUPPORT INTERFACE
    a. Is there tube to support wear? Fretting? Kinked areas or gouging from a bent tube or support?
10. TUBE SUPPORTS, TIE RODS/SPACERS, SKID BARS
    a. Broken welds? Loose hardware? Anything prohibitive to re-stuffing the bundle? Etc.
11. Deflection plates
    a. Take photos with reference of location in mind.
    b. Take photos of all. Did you check underneath?
12. FLOATING TUBESHEET
    a. The entire tubesheet should be in frame, and orientated so the top is the top of the photo.
    b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).



13. GASKET SURFACE OF FLOATING TUBESHEET
    a. Photo should be of a section that represents the condition of the gasket surface.
14. REAR GASKET SURFACE OF FLOATING TUBESHEET
    a. Photo should be of a section that represents the condition of the gasket surface.
    b. Include view of tubing entering tubesheet
15. PASS PARTITION GROOVES OF FLOATING TUBESHEET
    a. Represent the overall condition of the grooves (is there corrosion? Mechanical damage?)
16. TUBE ENDS OF FLOATING TUBESHEET
    a. Tube layout (square pitch, Triangle pitch)
    b. Overall condition of tube ends (is there corrosion? Erosion? Mechanical damage?)
17. ROLL AREAS OF FLOATING TUBESHEET
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
    e. Use caliper in photo if necessary to convey information.
18. ENTIRE EXCHANGER FROM FRONT VIEW
19. ENTIRE EXCHANGER FROM REAR VIEW
20. Photos of any corrosion, wall losses, mechanical damages, or other adverse conditions that will be noted in the report.
21. Second photo of Fixed tubesheet with any paint markings of note (i.e. recommended plugs) if applicable.
22. Photos of any samples that were removed if applicable.



# U-Tube Bundle (Out of Shell)

1. FIXED TUBESHEET
    a. The entire tubesheet should be in frame, and the top orientated to the top of the photo.
    b. If it is not possible to get the entire tubesheet in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).
2. GASKET SURFACE ON FRONT OF FIXED TUBESHEET (If channel head has been removed)
    a. Photo should be of a section that represents the condition of the gasket surface.
3. PASS PARTITION GROOVES OF FIXED TUBESHEET
    a. Represent the overall condition of the grooves (Is there corrosion? Mechanical damage?).
4. TUBE ENDS OF FIXED TUBESHEET
    a. Tube layout (square pitch, triangle pitch)
    b. Overall condition of tube ends (Is there corrosion? Erosion? Mechanical damage?)
5. ROLL AREAS OF FIXED TUBESHEET
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
    e. Use caliper/micrometer in photo if necessary to convey information.
6. STAMPING ON EDGE OF TUBESHEET
    a. Item #, tubesheet material, serial number, date of installation, etc.
    b. Angle light source to cast a shadow if necessary
7. REAR GASKET SURFACE OF FIXED TUBESHEET
    a. Photo should be of a section that represents the condition of the gasket surface.
    b. Include view of tubing entering tubesheet
8. TUBING O.D. SURFACES
    a. Include multiple tubes.
    b. Use caliper in photo if necessary to convey information.
9. TUBING / TUBE SUPPORT INTERFACE
    a. Is there tube to support wear? Fretting? Kinked areas or gouging from a bent tube or support?
10. TUBE SUPPORTS, TIE RODS/SPACERS, SKID BARS
    a. Broken welds? Loose hardware? Anything prohibitive to re-stuffing the bundle? Etc.
11. DEFLECTION PLATES
    a. Take photos with reference of location in mind.
    b. Take photos of all. Did you check underneath?
12. U-BEND AREA OF TUBING AND COMPONENTS
    a. Represent the overall condition of the U-bend are.
    b. Take multiple photos if necessary.
13. ENTIRE EXCHANGER FROM FRONT VIEW
14. ENTIRE EXCHANGER FROM REAR VIEW
15. Photos of any corrosion, wall losses, mechanical damages, or other adverse conditions that will be noted in the report.
16. Second photo of Fixed tubesheet with any paint markings of note (i.e. recommended plugs) if applicable.
17. Photos of any samples that were removed if applicable.

# Fin Fan Exchanger

1. FRONT HEADER BOX (INLET SIDE)
    a. The entire header box should be in frame, and the top orientated to the top of the photo.
    b. If it is not possible to get the entire header box in frame, take photos of sections that will display the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).
    c. Include Inlet/Outlet piping when present.
2. TUBE ENDS
    a. Overall condition of tube ends (Is there corrosion? Erosion? Mechanical damage?)
3. ROLL AREAS
    a. I.D. of tube.
    b. Take a couple photos.
    c. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    d. Use a light source if needed.
2. SERIAL TAGS & INFORMATION PLATES
    a. Serial number, Nat'l Board #, design pressures, design temp., type, etc.
    b. Angle light source to cast a shadow if necessary
4. TUBING O.D. SURFACES
    a. Include a photo of tubing to rear of tubesheet interface whenever possible.
    b. Include a photo that represents general condition of fins.
5. REAR HEADER BOX (NON-INLET SIDE)
    a. The entire header box should be in frame, and the top orientated to the top of the photo.
    b. If it is not possible to get the entire header box in frame, take photos of sections that will display
the entire tube sheet when combined (be sure to take photos in a logical sequence if necessary).
    c. Include Outlet piping when present.
6. TUBE ENDS AT REAR
    b. Overall condition of tube ends (is there corrosion? Erosion? Mechanical damage?)
7. ROLL AREAS OF REAR TUBESHEET
    c. I.D. of tube.
    d. Take a couple photos.
    e. Represent overall condition (Pitting? Corrosion? M/D? Scale? Deposits?)
    f. Use a light source if needed.
8. Photos of any corrosion, wall losses, mechanical damages, or other adverse conditions that will be noted in the report.
9. Second photo of header box with any paint markings of note (i.e. recommended plugs) if applicable.
10. Photos of any samples that were removed if applicable.

# Digital Photo Tips

**Practice Everything!**

SUMMARY: Get accustomed to your digital camera's features and practice everything before you go on your next job. Don’t let laziness get in the way of perfection.

before your next job, spend a couple of hours, read your digital camera's manual, and get outside and practice every feature you can think of. Trust me; most people use a very small subset of their digital camera's capabilities. Your camera may have macro mode, letting you take beautiful pictures of exchangers if you get your subject in the right focal range. It may have a landscape mode that brings clarity to a panorama of outdoor sights, like tube corrosion, but you have to know how to enable this feature. Perhaps your digital camera has a special portrait mode to enhance the subject and blur the background. If so, grab a couple of gallons of initiative and take a few practice shots of anything you desire (exp. Trees, garage, of your bathroom in the pitch dark, or maybe corrosion).

Remember - you can always delete practice photos, the only thing you are hurting is battery power. But, while you are away from your friendly confines and a photo opportunity arises, it's hard to fully take advantage of digital camera features that you have not previously used.

**Steadying your Digital Camera**

SUMMARY: Reduce digital camera shake by following these tips to steady your camera.

If you take digital photos that suffer from blurred images, you may be experiencing "camera shake". This is caused by the camera moving while the picture is being taken - sometimes the result of not holding the digital camera steady.

If you can, try watching a professional take photographs with their digital cameras and emulate their movements. When you are out taking pictures, try holding the digital camera closer to your body. Don't let your elbows stick out - bring them in so your lower arms (below the elbow) are parallel to your body. Then, move your elbows in, as close to your chest or stomach as possible, while you are still able to look through the viewfinder. The more you can steady your arms and the less they have a chance to move while snapping photos, the greater the chances your digital camera photos will remain sharp.

## Zoom versus Camera Shake

SUMMARY: Why zooming into a picture may make your digital camera photographs blurry, and what you can do about it.

Does your camera have a zoom lens? If so, heed this warning.

The more you zoom into a subject, the more you have to take care in being still when taking your photograph. Zoomed lenses cause photographs to be very susceptible to "camera shake", which can result in very blurred images. And, unfortunately, your digital camera's picture preview mode, with its lack of detail, may not show that the photographs you took were blurred - you may only find out after you copy the pictures to your computer!

If you are taking photos in the daytime or in other extremely lit situations, you won't have to worry about this as much. The more available light, the less time the digital camera requires to take an exposure, and the less chance camera shake can affect the result.

However, if you are taking pictures of moving subjects or in low-light situations, you need to be careful to keep the digital camera as steady as possible, or use a tripod if available. Or, better yet, try to get close to the subject (as long as that is safe!) so you don't require zooming in so much.

In low-light situations, you may want to consider manually adjusting the shutter speed so the digital camera takes pictures more quickly. However, this can result in photographs with washed out colors, or completely blank images in extreme circumstances, so you need to experiment.

## Use the Presets in Difficult Lighting

SUMMARY: Your digital camera preset modes may help you take beautiful pictures in difficult lighting conditions.

Many digital cameras come with what are called preset modes. By selecting these options in your camera, you may be able to take better pictures in certain situations than if you just "point-and-shoot". Here are some modes found in popular digital cameras; read your digital camera manual for details on which presets your digital camera supports.

Night - Just what it says; takes better pictures in low-light conditions.

Portrait - Brings clarity and attention to the subject while making the rest of the picture slightly blurred.

Landscape - Sharpens the entire picture, instead of just the focus area. Use this to take better shots of mountains, the beach, etc.

Sunrise/Sunset - Adjusts the camera's settings for these trickier light situations.

Motion - Adjusts the camera's exposure time settings to allow for quicker shots of moving subjects, such as people in sporting events.

**Turn Your Digital Camera**

SUMMARY: Sometimes a slight change can result in much better photos from your digital camera!

This one is simple, but if you don't think about it, you'll be surprised about what you've been missing!

Want to take pictures of tall statues, buildings, trees, or other tall structures, yet you can't seem to get the whole subject in the picture? Turn your digital camera 90 degrees to the side, then focus on your subject and snap the image.

Voila! Suddenly those tall items that couldn't fit in the digital camera's viewfinder before may fit perfectly now. And don't stop with turning your digital camera 90 degrees - experiment with other orientations!

**Dealing with Cloudy Days**

SUMMARY: Don't let cloudy days keep you from taking great photographs with your digital camera! Take advantage of the weather. In fact don’t let anything keep you from taking great photos.

A good photographer uses every situation to their advantage.

Did you want a bright, sunny day but find yourself underneath a cloudy sky? Use this to your advantage. Take a few photos of the clouds themselves, and try a few black-and-white shots as an experiment. Clouds can also add texture to a landscape or skyline photo. Instead of a dull, blue sky, a cloudy atmosphere can make the tops of such photos more interesting.

Get in front of a tall structure and point your camera upward so your subject and the cloudy sky can be seen in the viewfinder or LCD. The clouds plus the unusual photo angle may provide an interesting resulting photograph.

Is it so dark and cloudy that not enough light is reaching your intended subject? Try decreasing your camera's shutter speed (refer to your cameras user manual) to allow more luminance to reach the lens, but keep your camera steady to decrease the possibility of "camera shake". Use off-angle flash if necessary to brighten the photograph.

Work with your environment; don't fight it. Unless you have an infinite amount of time, the weather won't be "just right" every day you take photos. Instead of trying to force taking the kind of photos you want to take with sunny, bright-lit days, use clouds to your artistic advantage.

**Dealing with Sunny Days**

If you have to take a photo of your exchanger/other component and it's in direct sunlight then you have two options.

Option #1: Get as low to the ground as you can, if that doesn't clear it up then move slightly to the left or right, possibly tilt the camera up or down. The last chance of option one is to cup you hand around the lens to shield the sun light. NOTE to Magnetec Employees: try to keep your hand/ employees/ equipment out of your photos.

Option #2:  Take the photo anyway, then Wright yourself note to go back to that subject 1-2 hours later when the sun has changed positions.

Note: Most all cameras have a setting that will help absorb an overlit situation. (Refer to cameras user Manual)