PREVENTIVE MAINTENANCE

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Preventive Maintenance of SSE

SERVICE STATION

- **Safety Measures before SS PM**
- **Dispensing Pumps**
  - DP PM Checklist
- **Product StorageTanks**
- **Submersible Turbine Pumps**
- **Preventive Maintenance Database System**

Safety Measures before SS PM

- PM contractor should first advise the dealer or the service station supervisor that they will be conducting PM activities within the SS.
- Before conducting PM activities, the area undergoing PM must be secured with barricades or safety signs like “Maintenance On-Going” to prevent unauthorized persons from entering the area
- Reflectorized vests must be worn by the PM technicians for better visibility and warning that there are on-going maintenance activities.
- Hard hats and safety shoes must be worn by the PM technicians to ensure their safety during the PM activities.
- These safety measures are enforced to prevent accidents or minimize damages/casualties during the conduct of PM activities.

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Safety Measures before SS PM

1. Safety Barricade

2. Lock-out Tag-out

Lock-out Tag-out

• Lock-out Tag-out (LOTO) is a safety procedure used to ensure that the dispensing pumps are properly shut off and will not start up prior to completion of the maintenance work.

Dispensing Pumps

1. Display Test
2. Circuit Breaker Hotspot Test
3. DP Junction Box Hotspot Test
4. DP Emergency Stop Test
5. Voltage Reading
6. Current Reading
7. Water Sensing Filter Replacement
8. Megger Test
9. Flow Rate Test and Calibration
10. Pressure Test
11. Nozzle Auto Stop Test

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Display Test

- It is conducted to check the completeness all of the pixels in the LCD display of TATSUNO dispensing pumps

Circuit Breaker Hotspot Test

- Temperature should not exceed 40 degrees Celsius
- Uses an infrared thermometer
- High temperature reading indicates DP problems such as overcurrent
- It is done on the DP circuit breaker and busbar installed in the Panel Board
- Inspection is done monthly for CODO service stations and high volume/profile DODO service stations
- Inspection is done every 3 months for dealer owned service stations, Industrial accounts and MFS

DP Junction Box Hotspot Test

- Temperature should not exceed 40 degrees Celsius
- Uses an infrared thermometer
- High temperature reading indicates DP problems such as over current
- It is done on the junction box located inside the DP
- Inspection should be done monthly for CODO service stations and high volume/profile DODO service stations
- Inspection is being done every 3 months for dealer owned service stations, Industrial accounts and MFS

DP Emergency Stop Test

- The normally close emergency stop button of the dispensing pump should immediately stop the flow of product in the nozzle once it is pressed in order to minimize the damages in case of emergency.

Voltage Reading

- Voltage reading of the dispensing pump should be within 220-230V.
- Lower voltage reading results to the damage of motors installed in the dispensing pump
- Overheating may also occur in a DP that runs on a low voltage rating

Current Reading

- The current being drawn by the DP should only have a parameter of 5.4 – 5.8 Amperes

- DP running on a higher rated current will result to overheating and melted/ burnt wiring insulation

Water Sensing Filter Replacement

- Slow discharge of product is one of the indications that the fuel filter should already be replaced as soon as possible

- Water and sediments are trapped in the filter of DP

- Check / replace disposable filter element. Materials will be chargeable to the Dealer / Account.

Megger Test

- Insulation Test /Megger Test for the wires should be done semi-annually
- Insulation for each wires should not be less than 25 Mega-Ohms
- Replacement of DP wires should be done if the Megger Test results to a value less than 25 Mega-Ohms

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Flow Rate Test and Calibration

- The acceptable flowrate is 35 to 40 liters per minute (LPM).
- Check strainers and/or filters if clogged.
- Clean or replace as necessary.
- Calibrate the DP by dispensing 10L of product in a calibration bucket on a slow, medium and fast setting. Each DP setting should be calibrated to 0. Allowable tolerance is (+)(-)25 cc.

Pressure Test

- Pressure test should be conducted monthly on all CODO and high volume/ profile service stations.

- Replace pumping unit if the pressure is not within 24 to 32PSI.

Nozzle Auto Stop Sensor Test

- Nozzle auto shut off sensor should activate once it senses that the tank is full.

Submersible Turbine Pump (STP)

1. Megger Test
2. Hotspot Reading
3. Current Reading
4. Cleaning and Repainting of STP Head Assembly and Riser
5. Flow Rate Test
6. Mechanical Leak Detector Test

Megger Test

- Using a Megger/Insulation Tester, the wiring insulation should have a value of at least 25 Mega-Ohm
- STP must be disconnected during testing
- Can be tested either in STP wiring located at the panel board or on the STP unit

Hotspot Reading

- Using infrared thermometer, the temperature of the circuit breaker and of the busbar of the STP should not exceed 40 degrees Celsius

Current Reading

- Using an AC Clamp Ammeter the measured drawing current of STP should not exceed 7A for ¾ hp STP and 9A for 2 hp STP
- STP must be running during the current reading
- It can be tested either in the STP circuit breaker located in the panel board or in the electrical supply wire of the STP.

Cleaning and Repainting of STP Head Assembly and Riser

- Once a year, the STP head assembly including the riser is being cleaned thoroughly and repainted (color of epoxy paint depends on the brand of the STP installed: Red for Red Jacket and Blue for FE Petro)

- Avoid painting the portion with serial numbers/asset numbers of the STP.

Flow Rate Test

- Checking is done thru the dispensing pump
- Flow rate given by the STP must be within 35-40 LPM
- If the flow rate fell below the acceptable range, contractors must diagnose and implement necessary repairs like:
    - Clean strainers
    - Replace DP filters
    - Check line for leaks
    - Check end-bell

Mechanical Leak Detector Test

- Three distinct models
  - STP-MLD (blue) for gasoline, rigid and most flex piping
  - STP-MLD-D (tan) for diesel/kerosene (rigid and flex piping)
  - STP-MLD-E (gray) for expandable piping
- Conducted using a MLD test fixture
- Can be conducted on the DP connected to the corresponding STP
- Simulated DP leak should be at least 10psi pressure with a flow rate of 200mL/minute

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Product Storage Tanks (UGT)

1. Visual Inspections
2. Checking of Tank Appurtenances
3. Cleaning and Dewatering of Valve Box/Fill Sump
4. Cleaning of Monitoring and Observation Well
5. Repainting of Valve Box Walls
6. Product Quality Test
7. Ground Water Test for Contamination
8. Cleaning of Fill Sump
9. UGT Cleaning

Visual Inspection

- Check the connections in the STP Assembly Head
- Ensure Chico Compound on EYS
- Check if electrical connections are secured
- Check the valve and pipe fittings
- Check the cleanliness of the valve box (if there's excessive water or product outside the tank)

Visual Inspection

Observation Well – is the well connected to the UGTs (DWFGT) for the purpose of monitoring the water to identify if there's a leakage in the tank.

- ✓ In checking the monitoring well, the pipe must be filled with water, and only considerable amount of diminished water (due to evaporation) is acceptable.

Monitoring Well – is the well located on the perimeter of the tank farm for the purpose of contamination testing of the groundwater.

- ✓ In checking the observation well, the water inside the pipe must not contain products (fuel). If the water shows signs of products, there's a contamination below that could probably caused by leaks from tanks.

Tank Appurtenances

- Check the Valve Box cover and Fill Sump cover – covers must be in good condition, and replace if found broken.
- Check entry boot (for UGTs with tank sump) – tighten if loose.
- Check Fill Cap – cap must be water-tight and not moving. Gasket should be in good condition.
- Check Fill Pipes and PV Vent Caps
- PM contractors should always check and maintain the fill caps and perform product quality testing and ground water testing every month for CODO, and every three months for DODO.

Cleaning and de-watering of Valve Box and Fill Sump

- Cleaning of fill sumps and valve boxes should be done regularly especially after the delivery of products.
- There must be no unwanted materials/dirt inside the valve box and fill sump.
- Debris inside is considered as a hazardous waste thus, dealers/account holder must conduct proper waste disposal.
- For valve boxes and fill sumps with significant amount of water inside, cleaning and dewatering is necessary to maintain sanitation of the valve box and prevent possible water contamination.

Cleaning of Monitoring and Observation Well

- Observation well is connected to the tank which is found usually between the fill sump and the valve box, while Monitoring well is located at the perimeter.
- Inside the monitoring well/observation well is a pipe with cover for leak monitoring.
- There must be no unwanted materials inside.
- Cleaning of the monitoring/observation well must be done every 6 months by the PM contractor, and ensures that the cover can be easily opened at any given time.

Repainting of Valve Box

- During a DP PM schedule, repainting of the valve boxes and fill boxes are being conducted once a year. (Grey Epoxy paint as the standard color coding).
- Repainting of internal walls of valve boxes without tank sumps once a year. (2-coats minimum of Light grey latex paint).
- Avoid painting the portion with serial numbers/asset numbers of the tank.

Product Quality Test

- In checking if there is water contamination inside the tank, the fill pipe is being monitored regularly. PM contractors perform the checking upon doing the preventive maintenance of the DPs (every month for CODO and 3 months for DODO).

- Water Finding Paste (Gasoila) is applied to the deep stick which will be submerged to the fill pipe for at least 30 seconds.

- In case of water contamination, the presence of water will be determined by the change of color of the Gasoila. The normal color of Gasoila is reddish brown and it turns to color green once it reacted to water.

Groundwater Test for Contamination

- In checking if there's an oil spill, the observation well/monitoring well is being monitored regularly.
- Usually, the contractors collect a sample of water from the observation well, and check visually if there are signs of product present in the water sample.
- Product Finding Paste (Kolor Kut) is also used in checking the presence of product in the sample of water collected from the observation well.

Cleaning of Fill Sump

- During the receiving of product from the tank truck, it is inevitable to have spillage of product on the fill sump.

- During the product receiving process, there is a probability that the product will overflow especially if there is a problem on the UGT vent. This will cause ponding of product on the fill sump.

Cleaning of Fill Sump

Make sure the fill sumps are clean before the start of product receiving process.

When the fill sump is flooded with products during the receiving,

1) Prepare a clean sponge and funnel.

2) Absorb the product using the clean sponge.

3) Place the funnel over the fill pipe opening, and squeeze the sponge to return the product in the UGT.

4) Clean the fill sump after the product has been returned to the UGT. Make sure the fill cap is returned and snapped tightly.

UGT Cleaning

Clean tanks are an integral part of providing our customers with uncontaminated fuel, and essential in maintaining your pumping system's integrity.

Without proper cleaning, tanks are susceptible to build up of sludge, loss of capacity, and contamination.

Underground storage tank cleaning and polishing systems remove sludge and contaminants.

UGT Cleaning

- It is performed every 2 years on all UGTs of CODO and DODO service stations
- While UGT cleaning is being performed, welding, burning or other maintenance work in the area which might create a source of ignition, should be stopped.
- Residual product should be pumped off to the lowest possible level through the water draw-off or pump out connection.
- Pumping in of water through existing piping connections (not through a roof opening) will float any remaining product out of low spots and continue pumping off or draining until all possible residual oil has been removed.
- Continuous ventilation and vapor testing should be done prior to the cleaning of tank

Thank you!