

CHAPTER - 8

HANDLING OF PETROLEUM PRODUCTS

(FUEL, OIL, AND LUBRICANTS)

8.1 **Introduction**

One of the major items handled by DPS Stores Unit is Petroleum Products in the form of Motor Sprit, Diesel, Furnace Oil and Lubricants. These FOL items are obtained from crude petroleum by a process of fractional distillation. Stores Unit shall pay special attention while receiving, storing or issues of these items because of their peculiar nature and associated risk.

Commonly used FOL items by DAE Units are:

- a) Petrol
- b) Diesel
- c) Lubricating oils such as engine oil, gear box oil, etc.
- d) Hydraulic fluids such as brake fluids, etc.
- e) Greases: These are semi-solid masses containing mineral or lubricating oil and fatty acids/soaps of sodium, Aluminum, Calcium, Barium, Lithium, Strontium, etc.
- f) Fuel oil (also known as heavy oil, marine fuel or furnace oil). It is a dark viscous residual product, a fraction obtained from petroleum distillation, either as a distill or a residue. It is primarily used for steam boilers, in power plants, aboard ships and in industrial plants.

8.2 **Mode of Supplies**

8.2.1 Supplies are received in Unit by:

Bulk in Road Tankers.

Packed in containers like barrels, drums and tanks, which may be conveyed by Road.

8.3 **Receipt of FOL**

8.3.1

When the fuel is received by road tankers, receiving personnel shall ensure that the domes and the discharge points are intact, and that there is no sign of leakage. They are also to draw a small quantity of fuel from each discharge point into glass receptacles to ensure correctness of the colour of the fuel and absence of rust particle and water. If the seals are broken, first report is to be made to oil company / supplier and fuel is to be decanted in the presence of user representative who is in a better position to certify that the fuel is free from contamination. During the transaction-receipts, stock and delivery, tank wagons and lorries transporting petrol/diesel shall be filled or discharged by means of metal pipes or armoured hose.

- 8.3.2 If the tanker is found to be leaking the matter shall be reported to supplier immediately and further action to decant the product, etc. shall be taken as per the Standard Operating Procedure. However the signature of the driver shall be obtained on receiving documents with the remarks of tanker leakage and the resultant shortages.
- 8.3.3 Before the transfer of fuel to the bulk installation/barrels, the quantity of fuel in the road tankers is to be ascertained by weighing before and after decanting or by opening the dome at the top and using the loading bar/dip rod. Water searching test may be followed if considered necessary. If the contents are not in conformity in quantity and grade mentioned, the matter shall be taken up with the supplier. Wherever lab testing facilities are available sample collected from the tanker is tested for ensuring the quality before decanting the bulk supply.
- 8.3.4 The quantity of fuel actually can be assessed by weigh bridge measurements or reference to dip reading of the bulk installation or the capacity of barrels filled. Quantity at the normal temperature is to be converted to quantity at standard temperature to ascertain deficiency if any. The fuel is to be accounted for at standard temperature.
- 8.3.5 When the fuel is received in road tankers, the vehicle is to be driven at the level platform before decanting and is to be allowed to remain stationary for minimum 30 minutes. Further the seals on top of each compartment and outlet valves down below are checked to make sure that they are not tampered with. Thereafter only the dip check for quantity is to be done. Water content test may follow if considered necessary. The master control valves for different compartments of the tankers are to be ensured to be in open position at the time of decanting. After the fuel stops flowing out, the discharge points are to be closed, the transfer hose to be disconnected and the tanker be driven for at least 200 metres and brought back to the level platform. The transfer hose is to be reconnected and the valves at the discharge points are reopened. Once fuel again stops flowing out, the representative may climb up the tanker and physically ensure by opening the top dome lids of every compartment that no fuel is left in the tank.
- 8.4 **Receipt of Lubricating Oils and Grease**
- 8.4.1 The procedure to be adopted for such receipts is that they are always received and transported in containers.
- 8.4.2 Drums, pails and cans of lubricants when received should be leak proof, clearly labelled and with a brand name, type of lubricant inside, etc.
- 8.4.3 Careful handling should be followed to prevent leaks, contamination of content, smudge, tear or damage of labels.
- 8.4.4 Correct unloading procedures will prevent damage to drums and injury to personnel. Proper unloading procedures like wood/metal skids, hydraulic lift gate/forklift to lower drums from delivery trucks, etc. Drum should not be allowed to roll under its own momentum, under any circumstances.
- 8.4.5 Once unloaded, the drums should be moved immediately to storage area.

8.4.6 Lubricating oils and greases can deteriorate or become contaminated due to:

- Damaged containers
- Moisture condensation
- Dirty dispensing equipment
- Exposure to dust or chemical fumes.
- Poor outdoor storage practices.
- Mixing different brands or types.
- Exposure to heat or cold.
- Exceeded shelf life.

8.5 The *challan* must :-

- a) Be made out of ink or be printed legibly
- b) Have the 'Original' copy marked at the top with words 'Accounts Copy' with full signature of the person signing the receipts at the bottom thereof, the remaining copies are to be marked duplicate, triplicate, etc.
- c) Show the details of fuel lifted from the oil company.
- d) Show the quantity lifted in words as well as in figures.
- e) Show the packing material supplied if any.
- f) Show the place, date and time of drawing the product.
- g) Show the name, and designation of the person drawing.

8.6 **Storage of Fuel – Bulk Installation**

8.6.1 The specifications of storage tanks and associated installation should be constructed as per the standard provided by statutory authorities and necessary approval including storage licence should be obtained from them. The storage facilities shall not be situated near exit points so as not to hinder escape in case of fire.

8.6.2 Instructions and diagrams concerning BPI (Bulk Petroleum Installation) shall be displayed conspicuously for the guidance of the personnel concerned. Suitable warning, notices such as 'Petroleum', 'Highly inflammable' 'No smoking', 'Danger', etc. are displayed prominently at places in and around the installations. The personnel employed in BPI may ensure that:

- a) No naked lights shall be carried. Flame proofed lamps or torches are to be used and electrical fittings shall be flame proof.
- b) Boots and shoes without ferrous metal riveting or studs are only to be used.
- c) Sufficient sand containers with sand are to be available at all times. Suitable fire appliances shall be maintained in serviceable condition all times.
- d) Cotton rags and cloth pieces used for cleaning should be removed from the vicinity immediately after use.
- e) Special types of tools of non-ferrous metals shall only to be taken into the fuel installations, if required.

- f) The area of 15 metres in all directions from the perimeter of the bulk tank and dump is to be declared as 'Danger Area'.
- g) These buildings are not to be nearer than 30 metres to workshops where welding, cutting, forging, etc. are carried out. These buildings are not to be heated by coal, coke, stove or any other form of open fire.
- h) Unauthorised persons shall not be allowed near installation.
- i) Bungs and caps are to be secured tightly and no leakage shall be allowed. Whenever such leakages are traced, containers are to be changed.
- j) Engines of the vehicles shall not be kept running during refuelling/decanting.
- k) Main switch of the installation should be kept off while not in use.
- l) Matches, lighters or other means of ignition in any form shall not be carried by anyone entering the installation.
- m) In the general fire scheme of the Unit the IC fire section is to inspect the installation weekly and record of such inspection to be maintained in fire section as well as in the fuel installation.
- n) Grass and weeds are to be cut periodically and removed from the danger area to reduce fire risk.
- o) In all those rooms where inflammable liquids, i.e., greases and lubricants and hydraulic fluids, etc., are stored and handled, good ventilation must be ensured.

8.7 **Daily Stock Check**

- 8.7.1 Daily stock check of fuel by in-charge refuelling section in bulk installation is to be carried out in the opening hours and the result recorded on the FOL stock sheet. In addition the officer-in-charge is to personally check the stock once a week and the results recorded.
- 8.7.2 The readings of temperature and quantities of fuel in bulk storage are to be recorded in FOL transaction voucher.
- 8.7.3 Shortage in mild steel items stored in open yard can be attributed to weight loss on account of open storage exposing vagaries of nature, weight difference due to number of weighing in different scales etc. Some items are likely to evaporate/shrink in storage due to inherent nature. Shortages up to 1% on the total quantity issued shall be allowed.
- 8.7.4 If the discrepancies recorded in daily stock check exceed 1% of the turnover, the matter should be enquired in detail and necessary action to adjust the loss or write off, etc. shall be taken with the approval of the competent authority.

8.8 **Water Test**

- 8.8.1 A test of presence of water is to be carried out by smearing the dip rod with water searching paste and using it in the fuel storage tanks at BPI's as follows:
 - Beginning of the week, i.e., 1st working day of the week immediately after rains.

- Whenever there is a reason for such water contamination.
- The paste changes colour on contact with water. The quantity of water is to be recorded in the relevant register.
- Water when detected is to be immediately drained and the same is to be recorded under the authority of the concerned officer.

8.8.2 If water is noticed in the tanker, the water should be collected in the container by breaking the seals of the bottom wall valve. The short receipt on account of removal of water from the tanker should be recorded and top up the tanker by adding the short fuel from the lorry to ascertain the exact quantity.

8.8.3 If the product level in compartment of tanker is found “short dip” on account of removal of water, as explained in 8.8.2 should be shown to the driver of the tanker to ascertain the short receipt and his counter signature should be taken on the reverse side of all the copies of *challan*/invoice so as to avoid future disputes with suppliers. Such incidence should be reported to supplier immediately.

8.9 **Turnover**

8.9.1 Turnover for the given period is calculated on the basis of actual receipts plus actual issues during the period. Where, however, there is no movement of stock or the sum of receipts and issues is less than the operating stocks, the opening stock is to be considered as turnover.

8.9.2 Expansions and Contraction of Fuel

8.9.3 Fuel expands and contracts in response to variation in the temperature. The ‘standard temperature’ for accounting purpose is 30° C.