Procedure for fuel change-over

Normal operation of MAN B&W two-stroke diesel engines is on HFO.

1) However, change-over to diesel oil can become necessary if, for instance:

- The vessel is expected to have a prolonged inactive period with cold engine, e.g. due to:

  - a major repair of the fuel oil system, etc.
  - a docking
  - more than five days' stop (incl. laying-up)

- Environmental legislation requiring the use of low-sulphur fuels

2) Change-over can be performed at any time:

- during engine running
- during engine standstill

3) In order to prevent:

- fuel pump and injector sticking/scuffing
- poor combustion
- fouling of the gasways

It is very important to carefully follow the temperature/load requirements of the change-over procedure.

A. Change-over from Diesel Oil to Heavy Fuel during Running

To protect the injection equipment against rapid temperature changes, which may cause sticking/scuffing of the fuel valves and of the fuel pump plungers and suction valves, the change-over is carried out as follows (manually):

First, ensure that the heavy oil in the service tank is at normal temperature level.

Reduce the engine load to ¾ of normal. Then, by means of the thermostatic valve in the steam system, or by manual control of the viscosity regulator, the diesel oil is heated to max. 60-80° C. Regulate the preheating so as to give a temperature rise of about 2° C per minute.

The diesel oil viscosity should not drop below 2 cSt, as this might cause fuel pump and fuel valve scuffing, with the risk of sticking, due to failing lubrication ability of the diesel oil.

For some light diesel oils (gas oils), this will limit the upper temperature to somewhat below 80° C.

Due to the above-mentioned risk of sticking/scuffing of the fuel inspection equipment, the temperature of the heavy fuel oil in the service tank must not be more than 25° C higher than the heated diesel oil in the system (60-80° C) at the time of change-over.

When the temperature requirements have been fulfilled, the change to heavy oil is performed by turning the change-over cock. The temperature rise is then continued at a rate of about 2° C per minute, until reaching the required viscosity.

B. Change-over from Heavy Fuel to Diesel Oil during Running

See also Item 3.1, Precautions

To protect the fuel oil injection equipment against rapid temperature changes, which may cause scuffing with the risk of sticking of the fuel valves and of the fuel pump plungers and suction valves, the change-over to diesel oil is performed as follows (manually):

- Preheat the diesel oil in the service tank to about 50° C, if possible
- Cut off the steam supply to the fuel oil preheater and heat tracing
- Reduce the engine load to ¾ of MCR load
- Change to diesel oil when the temperature of the heavy oil in the preheater has dropped to about 25° C above the temperature in the diesel oil service tank, however, not below 75° C.

Note: If, after the change-over, the temperature (at the preheater) suddenly drops considerably, the transition must be moderated by supplying a little steam to the preheater, which now contains diesel oil.

C. Change-over from Heavy Fuel to Diesel Oil during Standstill

- Stop the preheating. Regarding temperature levels before change-over, see Item B "Change-over from Heavy Fuel to Diesel Oil during Running".
- Change position of the change-over valve at the fuel tanks, so that diesel oil is led to the supply pumps.
- Start the supply pumps and circulating pumps (if they are not already running)
- Change position of the change-over valve at the venting pipe, so that the fuel oil is pumped to the HFO tank.
- When the heavy fuel oil is replaced by diesel oil, turn the change-over valve at the venting pipe back to its normal position, so that the heavy oil in the venting pipe is now mixed with diesel oil.
- Stop the supply pumps.
- Stop the circulating pumps.