Twinning Project TR 08 IB EN 03

Oil Refineries Training

Mission 2

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Applicable BREFs

- Sector BREFs: Refining of oil and gas
  - ✓ LCP ?
  - ✓ Large Volume Organic Chemicals ?
- Horizontal BREFs:
  - ✓ CWW
  - ✓ Monitoring
  - ✓ Industrial cooling
  - ✓ Energy efficiency
  - ✓ Emissions from Storage
  - ✓ Economic and cross media effects

Which BAT are applicable?

- Remember that the case under study unit is an existing unit and according to the guide could be difficult to apply some BAT:

Frequently, depending on local conditions of the sector in a country, difficulties to fulfill some emission level values and conditions considered as BAT are found

Which BAT are applicable?

1. Design Techniques

- a. Pinch analysis: Methodology based on a systematic calculation of thermodynamic targets for minimizing energy consumption of processes. Used as a tool for the evaluation of total systems designs.
- b. Heat integration: Heat integration of process systems ensures that a substantial proportion of the heat required in various processes is provided by exchanging heat between streams to be heated and streams to be cooled.

Which BAT are applicable?

2. Process control and maintenance techniques

- Heat and power recovery: Use of energy recovery devices.
- Process optimization: Automated controlled combustion in order to lower fuel consumption per tonne of feed processed ften combined with heat integration for improving furnace efficiency.

Which BAT are applicable?

1. Monitoring of emissions to air

- Monitoring of SOx, NOx, and dust associated with the control of surrogate parameters

2. Monitoring of key process parameters

- Monitoring of parameters to prevent/reduce pollution,
- Monitoring of key parameters to ensure process stability, e.g. temperature, air flow

Which BAT are applicable?

Prevention of air emissions from flares

- In order to prevent emissions to air from flares, BAT is to use flaring only for emergency situations or non-routine operational conditions (e.g. start-ups, shutdown).

Which BAT are applicable?

Minimization of noise

- Make an environmental noise assessment and formulate a noise management plan as appropriate to the local environment
- Enclose noisy equipment/operation in a separate structure/unit
- Use embankments to screen the source of noise
- Use noise protection walls

Which BAT are applicable?

Reduction of dust and metal emissions

Selection or treatment of fuel
- Use of gas to replace liquid fuel

Combustion modifications:
- Optimisation of combustion,
- Atomisation of liquid fuel

Which BAT are applicable?

Reduction of SOx emissions from the combustion units

Selection or treatment of fuel

- Use of gas to replace liquid fuel
- Treatment of refinery fuel gas (RFG)

Which BAT are applicable?

Reduction of SOx emissions form sour water stripping units

- In order to prevent and reduce emissions to air when using a sour water stripping unit, BAT is to route the acid off-gases from this unit to an SRU or any equivalent gas treatment process. It is not BAT to directly incinerate the sour water stripping and incondensable untreated gases

Which BAT are applicable?

Minimization of air emissions from the distillation process

- In order to prevent or reduce emission to air from distillation units, BAT is to ensure the appropriate treatment of process off-gases, especially incondensable, by routing them to acid gas removal prior to further use

Which BAT are applicable?

Reduction of NOx emissions from the combustion units

Selection or treatment of fuel
- Use of gas to replace liquid fuel

Optimization of combustion
- Flue-gas recirculation
- Diluent injection
- Use of Low-NOx burners (LNB)

Which BAT are applicable?

Reduction of CO emissions from the combustion units

- In order to reduce carbon monoxide (CO) emissions to air, BAT is to use combustion operation control

Which BAT are applicable?

Integrated refinery management - Reduction of diffuse VOC emissions

- Techniques related to plant design:
- Techniques related to plant installation and commissioning
- Techniques related to plant operation (LDAR)

Which BAT are applicable?

Reduction of water consumption and volume of contaminated water

- Water stream integration
- Water and drainage system for segregation of contaminated water streams
- Segregation of non-contaminated water streams (e.g. once-through cooling, rain water)
- Prevention of spillages and leaks

Which BAT are applicable?

Reduction of the emission load of pollutants

- Removal of insoluble substances by recovering oil
- Removal of insoluble substances by recovering suspended solid and dispersed oil
- Removal of soluble substances including biological treatment and clarification
- Additional final step treatment (e.g. nitrification denitrification process)

Which BAT are applicable?

Reduction of water consumption and discharges from the desalting process

- Recycling water and optimisation of desalting process
- Multistage desalter
- Additional separation step

Which BAT are applicable?

Minimization of waste water from distillation process

- In order to prevent or reduce waste water flow generation from the distillation process, BAT is to use liquid ring vacuum pumps or surface condensers

Which BAT are applicable?

Minimization of water pollution from the distillation process

- In order to prevent or reduce water pollution from the distillation process, BAT is to route sour water to stripping unit in an enclosed system

Which BAT are applicable?

Monitoring of water discharges

- BAT is to monitor discharges to water for the pollutants by using the monitoring techniques with at least the frequency given in the refinery guide, in accordance with EN or ISO standards. If EN or ISO standards are not available, BAT is to use national or other international standards that ensure the provision of data of an equivalent scientific level.

Which BAT are applicable?

BAT for waste management

- Waste management plans may be applied in order to prevent the generation of waste and reduce its final quantity, including, for example, the techniques in point 4.4 of the refinery guide.

Which BAT are applicable?

Minimization of emissions to soil and groundwater from the storage of liquid hydrocarbon compounds

- Double bottom tanks
- Impervious membrane liners
- Sufficient tank farm bund containment
- Maintenance programme including corrosion monitoring, prevention and control