

## Guidance Note

### Flaring

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#### Definitions:

<i>ARWA</i>	Advanced Regulatory Wiki Application (produced by SEU)
<i>BAT</i>	Best Available Technique
<i>BRC</i>	Beyond Regulatory Control
<i>Bref</i>	BAT reference document
<i>CA</i>	Competent Authority
<i>EIA</i>	Environmental Impact Assessment
<i>EMP</i>	Environmental Management Plan
<i>EPR</i>	Environmental Performance Report
<i>ER</i>	Environmental Review
<i>FlaCon</i>	Flaring Consignment
<i>FlaP</i>	Flaring Plan
<i>IPPC</i>	Integrated Pollution Prevention and Control
<i>MECA</i>	Ministry of Environment and Climate Affairs
<i>SEU</i>	Sohar Environmental Unit

### 1: Objective and Approach

Flaring is the release of un-processable components, mostly hydrocarbons, by open burning. In the Sohar industrial area there are two types of flares: high elevated flares on 80 to 120 m in the petrochemical industry and low flares to 15m mostly in natural gas systems.

The burning process in flaring is rather uncontrolled and the resulting emissions consist of hydrocarbons (methane and NMVOC), NOx, SO<sub>2</sub>, CO<sub>2</sub>, CO, soot and other components that result from incomplete combustion.

A flare is considered as a safety device that is used when an upstream process shows failure and equipment has to be purged. Burning-off the gases is a better option than venting the gasses unburned, but still there are environmental concerns.

Although the usage of flaring must be restricted to incidents (shut-downs, start-ups, trips), in practice the flare is used in operational cases and there is little incentive to limit flaring. Considering the releases to the atmosphere, the light nuisance, the black smoke when not sufficient steam is used, the occasional sound/vibration and climate issues, SEU/MECA wants to regulate the flaring in a more protocolled way as described in this Guidance Note.

### 2: FlarePlan (FlaP)

In order to know the specific backgrounds and operational details of the flares and the flaring, the SEU requires the submission of a Flaring Plan (FlaP). Based on the FlaP SEU will allocate to each flare a Flare Consignment (FlaCon) that defines the conditions under which flaring is allowed like the process condition,

the maximum yearly amount that can be flared and/or the maximum number of hours per year that flaring is allowed.

The information to be included in the FlaP is:

- Overview of the construction details of all operated flares, including the design basis (e.g. API 521), plotplan location, coordinates, height, safety footprint etc.
- Process details, including PFS, pilot load, max load, measuring/monitoring equipment.
- Operational details, flared amounts (in ton/h) over the last 12 month on daily basis, composition of flared gasses, calorific value, steam/HC ratio.
- Control details, analysis of reasons for flaring, prognoses of flaring requirements for the next 12 month's.

## Flaring Consignment (FlaCon)

The Flaring Consignment consists typically of the following:

- Administrative information including identification of the flare, the environmental permit under which the flaring is allowed, etc.
- Reporting requirements. Typically the reporting will be integrated into the regular environmental performance report (EPR).
- Allowed flaring profile that consist of one or more of the following elements:
  - Process conditions under which flaring is allowed (or not allowed).
  - Maximum number of flaring occasions per year.
  - Maximum amount of flaring hours per year.
  - Maximum amount flared in tons/yr of hydrocarbons, sulphur components, etc.
  - Minimum steam/hydrocarbon ratio to be used.
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## Emissions

Flare emissions can be estimated based on emissions factors. In EPA references (<http://www.epa.gov/ttnchie1/ap42/ch13/final/c13s05.pdf>), the following factors are used: NOx: 0.68; CO: 0.37; THC 0.14 lb/10<sup>6</sup> BTU but other sources can be used for estimating the emissions from the flaring operations.

## Enforcement

Enforcement will be considered if and when flaring occurs that is not according to the FlaCon. Flaring occasions must be reported with reasons why and amount flared in such way that can be verified if the flaring is within the FlaCon restrictions.

Flaring that is not compliant with the FlaCon can result in a fine.