

# METHANE FROM FLARING TOOLKIT



## Environmental Impacts: Flare Tip Integrity Inspection # Manual Inspection

Do I understand the impacts of the environment on my flare? > Environmental Impacts: Flare Tip Integrity Inspection # Manual Inspection

Regular inspection of flare tips (or burners) is recommended to ensure their safe and efficient operation and can be a regulatory requirement in some locations.

Inspection can be used to check the mechanical integrity of the flare tip and its associated ancillaries like flare pilots and ignition system. Flare inspection can also be used to check the functionality of the flare tip, pilots and ignition system. Flares can be inspected when they are in operation and also when they are shutdown. Inspections can be performed manually or remotely with the use of drones, helicopters or cameras.

## How it Works – Manual Inspection

Manual inspections require the flare to be shutdown and in a safe condition. Personnel can then approach the flare burners and carry out visual inspection of equipment, piping and ancillaries. Metal thickness measurements and non-destructive testing of materials can be performed

## Inspection Guidance

Some suggested areas for inspection are;

- Main Flare Tip(s)/Burners
  - Inspect tip for damage, bulging, deformation, corrosion, cracking, etc.
  - Observe condition of welds in tip body and any branch connections
  - Check burner to main riser flange and connecting bolts
  - If flare operational, check for flame burnback into flare tip.
  - Check for damage to wind shrouds, flame stabilisers
  - Look for signs of liquid carry over around burners
- Flare Pilots
  - Assess for mechanical condition of pilot burners (cracks, heat staining, distortion, etc.)
  - Check for correct positioning of pilot burners around main flare tip.
  - Check status of flare ignition equipment (spark plug, ignition rods)
  - Check status of flame detection equipment (ignition rod, thermocouples)
  - Check status of air inspirators
  - Check gas manifolds for distortion, missing bolts, missing brackets
  - Check status of electrical junction boxes, wiring conduits and connections.
  - If in service, check that pilots are lit with thermal camera.
- Flare Ancillaries
  - Check functionality of flare ignition system (electrical, ballistic or flame front generator)
  - Check functionality of pilot flare detection system (thermocouple, ionisation, etc.)
  - Check functionality of flare gas meters.
  - Check functionality of flare staging system.
  - Check flare purge meters and purge rate and adjust if necessary
- Reporting
  - Prepare a written report including pictures taken during inspection, an assessment of status of equipment and any instrumentation checks recorded.
  - Prepare a written report including pictures taken during fly-by and an assessment of status of equipment.
  - Retain electronic copies of pictures and thermal images taken at original file size and native format.

Advantages

<ul style="list-style-type: none"> <li>• Metal thickness measurements and non-destructive testing of flare equipment can be performed</li> </ul>	<p>Limitations</p> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>• Inspections can only be carried out when the flare is shutdown which may also require the whole facility to be shut down unless a standby flare is available</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Tightness of bolts and piping and instrument connections can be checked</li> </ul>	
<ul style="list-style-type: none"> <li>• Detailed photographs of equipment can be made</li> </ul>	<ul style="list-style-type: none"> <li>• Inspections may only be carried out infrequently</li> </ul>
<ul style="list-style-type: none"> <li>• Functionality of pilot ignition equipment can be checked</li> </ul>	
<ul style="list-style-type: none"> <li>• Opportunistic repairs or replacement of damaged equipment can be carried out</li> </ul>	<ul style="list-style-type: none"> <li>• Personnel access to the flare tip may be difficult, particularly if it is an elevated flare</li> </ul>

Go Deeper

Case study

Awaiting copyright approval

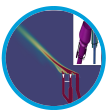
## Do I understand the impacts of the environment on my flare?



Environmental Impacts: Crosswinds – Empirical data and observations



Environmental Impacts: Flare Tip Integrity Inspection # Drone deployed



Environmental Impacts: Computational Fluid Dynamics (CFD) modelling to determine the effect of crosswind on flares efficiency

