Disclaimer

This document has been developed by the Methane Guiding Principles partnership. The Synopsis provides a summary of current known mitigations, costs, and available technologies as at the date of publication, but these may change or improve over time. The information included is accurate to the best of the authors’ knowledge, but does not necessarily reflect the views or positions of all Signatories to or Supporting Organisations of the Methane Guiding Principles partnership, and readers will need to make their own evaluation of the information provided. No warranty is given to readers concerning the completeness or accuracy of the information included in this Synopsis by SLR International Corporation and its contractors, the Methane Guiding Principles partnership or its Signatories or Supporting Organisations.

This Synopsis describes actions that an organisation can take to help manage methane emissions. Any actions or recommendations are not mandatory; they are simply one effective way to help manage methane emissions. Other approaches might be as effective, or more effective in a particular situation. What readers choose to do will often depend on the circumstances, the specific risks under management and the applicable legal regime.
Unintentional leaks from pressurized equipment used in oil and gas operations can lead to gas being released to the atmosphere. Methane emissions from leaks in equipment are mostly caused by imperfections or ordinary wear in sealed joints such as flange gaskets, screwed connections, valve-stem packing, seats on pressure relief valves, or poorly seated open-ended valves. They sometimes (though rarely) come from the wall of a vessel or pipeline.

Methane emissions from leaks in equipment can be reduced by the following steps.

- Keep an accurate inventory of emissions from leaking equipment by using a screening or measurement approach.
- Conduct periodic leak detection and repair surveys (LDAR) on all facilities above ground, and on underground pipelines, to identify and then repair leaks.
- Use focused programs such as ‘predictive maintenance and condition monitoring’, ‘directed inspection and maintenance’ (DI&M), or an ‘alternative monitoring program’.
- Replace or eliminate components that are chronic leakers.

These leak-reduction methods involve detecting and repairing leaks or, in the case of focused programs, concentrating on certain equipment or components that can produce large leaks, or by repairing only leaks that can be corrected cost-effectively. Operational repairs of leaks are also covered in a separate guide on that subject.

To be fully effective, all methods for detecting and repairing leaks should be built into a company’s management systems.
Methods of reducing methane emissions

Leak detection and repair (LDAR) programs
Leak detection and repair surveys should be performed at intervals to identify and repair leaks. Leak detection and repair programs may be voluntary or, in some areas, required by regulation. The frequency of surveys varies (generally from once a month to once a year).

Subsets of detection and repair programs are ‘smart LDAR’ programs or directed inspection and maintenance (DI&M) programs, which survey only some equipment and components known to have the most leaks, or which survey all equipment and components but only repair leaks when it is cost-effective.

Alternative programs
Equipment leaks may be reduced by ‘alternative programs’ or ‘equivalent LDAR programs’ that are alternates to the single method periodic surveys. Examples are varied, but include:
- more frequent remote screening combined with less frequent ground-based leak-detection surveys; or
- continuous monitoring programs.

These alternative programs are often based on newer technologies, and are still being developed and tested. Their equivalency to existing programs is not completely defined, but alternative programs may offer a more cost-effective solution than traditional LDAR.

Replacing or eliminating components that persistently leak
For components that regularly leak, instead of carrying out repeated repairs, you can replace the component with a superior one or completely eliminate the component.

Other methods of minimizing emissions during the repair of leaks are described in the operational repairs guide. Any method of leak detection and repair that you choose should be built into your management and record-keeping systems. The continual improvement guide deals with this integration.
Further information

MGP Website: www.methaneguidingprinciples.org

OGCI: https://oilandgasclimateinitiative.com


IEA Methane Tracker: https://www.iea.org/weo/methane

Natural Gas STAR Program: https://www.epa.gov/natural-gas-star-program