TR 138:2025
(ICS 49.020)

TECHNICAL REFERENCE

Use of unmanned aircraft systems (UAS) for oil, gas, chemical and industrial processing facilities, and related pipeline corridors

Singapore Standards Council

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Contents

Foreword

This Technical Reference (TR) was prepared by the Working Group on Drones for Chemical Industry Operations set up by the Technical Committee on Petroleum Processes and Products under the purview of the Chemical Standards Committee.

The capabilities of UAS have progressed in recent years, with increasing deployment for facility surveillance and inspection, especially at large-scale or high-risk sites.

Oil, gas, chemical, and industrial processing sites, and related pipeline corridors have specific traits and operational requirements. These sites encompass not only plants and facilities, but also other built infrastructure, undeveloped land parcels, and corridors. There is a need to bridge the gap between this set of requirements and those for UAS operations, so that site operators and UAS operators can understand the specific needs and challenges faced by both parties.

This TR describes procedures for site operators from the oil, gas, and chemical industries to engage with unmanned aircraft systems (UAS) operators for safe deployment.

This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

It is presupposed that in the course of their work, users will comply with all relevant regulatory and statutory requirements. Some examples of relevant regulations and acts are listed in the Bibliography. The Singapore Standards Council and Enterprise Singapore shall not be responsible for identifying all of such legal obligations.

Attention is drawn to the possibility that some of the elements of this TR may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "mature standards". Mature standards will not be subject to further review unless there are requests to review such standards.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore and the Singapore Standards Council shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR. Although care has been taken to draft this standard, users are also advised to ensure that they apply the information after due diligence.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

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1 Scope

This TR describes provisions for operators of oil, gas, chemical and industrial processing sites, and related pipeline corridors who wish to commission UAS missions to perform surveillance and inspections. It also provides details for the planning and oversight of UAS operations in the following locations:

- Oil, gas, and chemicals sites;
- Related pipeline corridors; and
- Industrial processing facilities.

Industrial processing facilities include those that process non-oil, gas or chemical products, such as pharmaceutical plants, waste and/or water treatment plants, public utilities, and food processing facilities.

This TR also provides information on how UAS operators can demonstrate their capabilities to help site operators procure the right services and facilitate smooth execution of UAS missions. Site operators that wish to develop in-house capabilities for carrying out UAS missions can also refer to this TR. An overview of the workflow is depicted in Annex A.

This TR does not cover the use of UAS to perform tasks such as transporting items, cleaning, spraying, or other forms of material discharge.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purpose of this Technical Reference, the following terms and definitions apply.

3.1 Confined space

Any chamber, tank, manhole, vat, silo, pit, pipe, flue or other enclosed space, in which:

a) dangerous gases, vapours or fumes are liable to be present to such an extent as to involve a risk of fire or explosion, or persons being overcome;

b) the supply of air is inadequate, or is likely to be reduced to be inadequate, for sustaining life; or

c) there is a risk of engulfment by a material.