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Explosive and toxic atmospheres — Hazard detection mapping — Guidance on the placement of permanently installed flame and gas detection devices using software tools and other techniques

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Contents

Summary of pages
This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 86, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 September 2020. It was prepared by subcommittee EXL/31/1, *Gas detectors*, under the authority of Technical Committee EXL/31, *Equipment for explosive atmospheres*. A list of organizations represented on these committees can be obtained on request to their committee managers.

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As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

0 Introduction

0.1 General

This British Standard is written in the form of guidance and supports flame and gas (F&G) detection standards across the industry.

One of the most challenging activities faced by a design engineer is deciding the quantity and location of gas detectors and/or flame detectors.

This British Standard refers to F&G coverage factors but does not specify target coverage factors for different applications. Coverage factors are only broad targets and are easily manipulated by changing device sensitivities, alarm trip levels, voting configurations, target gas concentrations, target flame size and other factors.

This British Standard also provides guidance on sensing technologies and the physical format of detectors which could greatly affect coverage (quantity and position). Irrespective of the quantity and positioning of detectors by a manual or software-related activity, the selection of incorrect sensing technologies leads to incidents not being detected or an increase in spurious trips.

This British Standard provides guidance on the full life cycle of a gas detection or flame detection system, emphasizing that mapping and/or modelling is an ongoing activity and not simply an activity that is carried out once in the design of a new facility. Routine surveillance of detector coverage during the full life cycle of a facility ensures that facility modifications, changes in hazards, etc., are all addressed, and the management of change highlights any deficiencies or opportunities for improvement.

Detector coverage within this British Standard means permanently-installed devices, which are the only devices for which guidance is provided. The use of additional personal monitors, e.g. portable gas detectors, does theoretically increase the density of "detecting devices" when persons are actively working within a plant area or location.

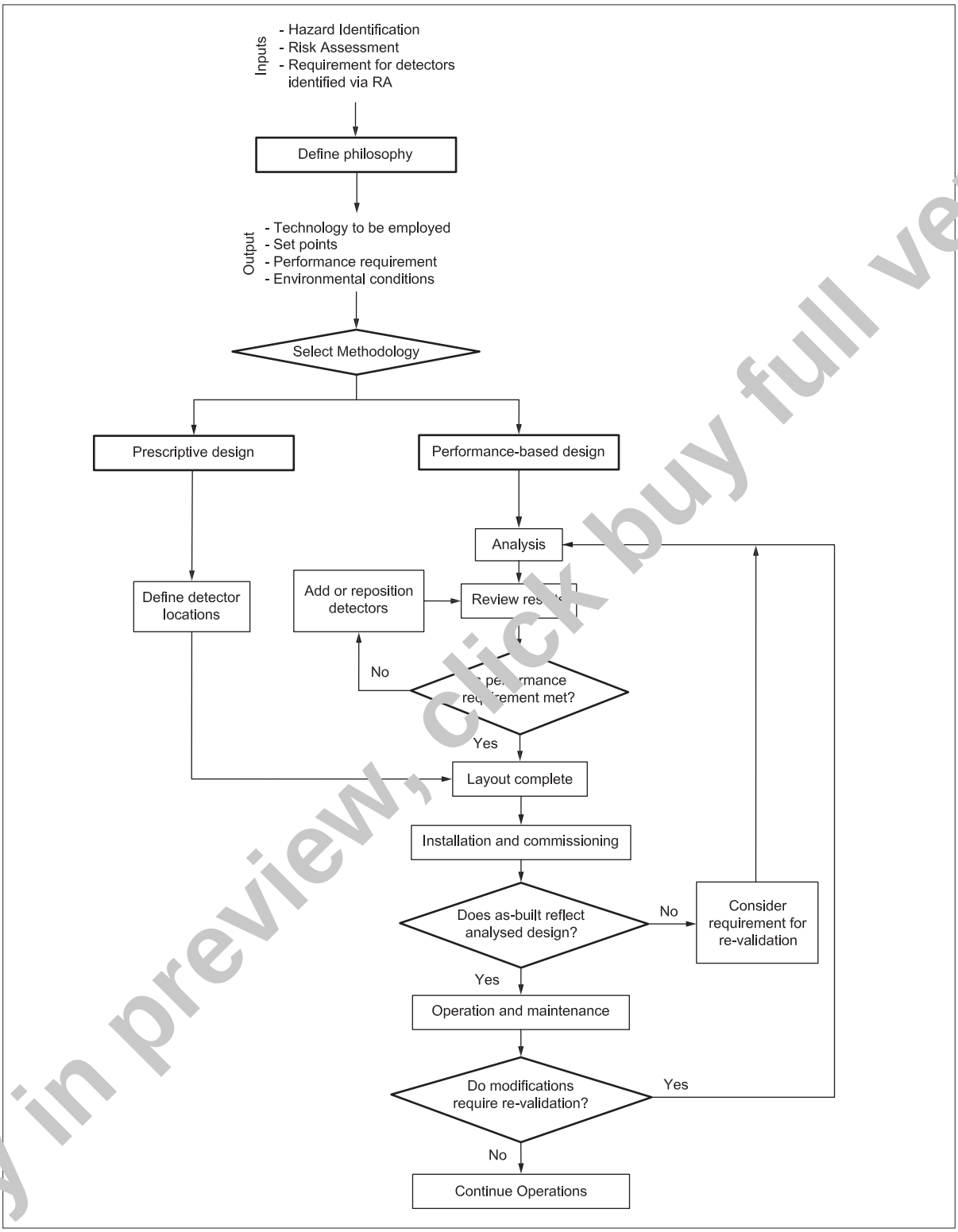
This British Standard is based on existing and established sensing and detector technologies and configurations. It is also based on many years of industrial experiences and lessons learned. This British Standard does not exclude emerging technologies or innovative ideas; however unless there is reasonable and practical evidence that these technologies or methodologies offer equal benefits, caution is advised.

This British Standard provides informative guidance on detection symbols (see Annex E), however this guidance does not preclude continued application of any established symbols applied by an operator or designer.

0.2 Document structure

The structure of the document and the process for F&G mapping is illustrated in Figure 1, with detail provided in Clause **4** to Clause **12**.

Figure 1 — *Document structure*



1 Scope

This British Standard provides guidance on the placement of permanently-installed F&G detectors, including coverage and technology selection.

NOTE 1 "Permanently-installed detection systems" include optical flame detection (including ultraviolet, infrared and imaging/visual), flammable gas/vapour detection and toxic gas detection.