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Guide for Fire Hazard Assessment of Rail Transportation Vehicles¹

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INTRODUCTION

The traditional approach to codes and standards is the specification of individual fire-test-response requirements for each material, component, or product that is found in a given environment and is deemed important to maintain satisfactory levels of fire safety. This practice has been in place for so long that it gives a significant level of comfort; manufacturers know what is required to comply with the specifications and specifiers simply apply the requirements. The implicit assumptions are not stated, but they are that the use of the prescribed requirements ensures an adequate level of safety. There is no need to impose any change on those manufacturers who supply safe systems meeting existing prescriptive requirements; however, as new materials, components, and products are developed, manufacturers, designers, and specifiers often desire the flexibility to choose how overall safety requirements are to be met. It is the responsibility of developers of alternative approaches to state explicitly the assumptions being made which result in a design having an equivalent level of safety. One way to generate explicit and valid assumptions is to use a performance-based approach, based on test methods that provide data in engineering units, suitable for use in fire safety engineering calculations, as this guide provides.

This fire hazard assessment guide focuses on rail transportation vehicles. Such a fire hazard assessment requires developing all crucial fire scenarios that must be considered and consideration of the effect of all contents and designs within the rail transportation vehicle, which will potentially affect the resulting fire hazard. The intention of this guide is that rail transportation vehicles be designed either by meeting all the requirements of the traditional prescriptive approach or by conducting a fire hazard assessment, that needs to provide adequate margins of error, in which a level of safety is obtained that is equal to or greater than the level of safety resulting from the traditional approach.

1. Scope

1.1 This is a guide to developing fire hazard assessments for rail transportation vehicles. It has been written to assist professionals, including fire safety engineers, who wish to prepare fire hazard assessments of rail transportation vehicles, including assessments for possible use in the design of such vehicles.

1.1.1 Potential users of this guide include professionals, who may assist manufacturers of materials, components, or products for use in rail transportation vehicles, manufacturers of the actual rail transportation vehicles, designers of such rail transportation vehicles, or specification writers.

1.2 Hazard assessment is a process resulting in the development of an estimation of the potential severity of the fires that can develop under defined scenarios, once defined incidents have occurred. Hazard assessment does not address the

likelihood of a fire occurring. Hazard assessment is based on the premise that an ignition has occurred, consistent with a specified scenario, and that potential outcomes of the scenario can be reliably estimated.

1.3 This guide cannot be used for regulation. It is not in itself a fire hazard assessment but only a guide for developing a fire hazard assessment. Moreover, it does not give instructions on acceptance criteria or recommendations, which only can come from a specifier or an authority having jurisdiction.

1.3.1 Selective use of parts of the methodology in this guide and of individual fire-test-response characteristics from Table X1 does not satisfy the fire safety objectives of this guide or of the table. This guide shall be used in its entirety to develop a fire hazard assessment for rail transportation vehicles or to aid in the design of such vehicles.

1.4 This guide includes and applies accepted and clearly defined fire safety engineering techniques and methods whose applications are consistent with both existing, traditional prescriptive codes and standards and performance based fire codes and standards under development throughout the world.

1.5 This guide is intended, among other things, to be of

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