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**Departamento de Estadística e Investigación Operativa Aplicadas y
Calidad**

**Configuración de un modelo conceptual para los Sistemas de
Gestión “QHSE3+”, con perspectiva de rendimiento
energético y administración integral de riesgos
Programa de Doctorado: Estadística y Optimización**

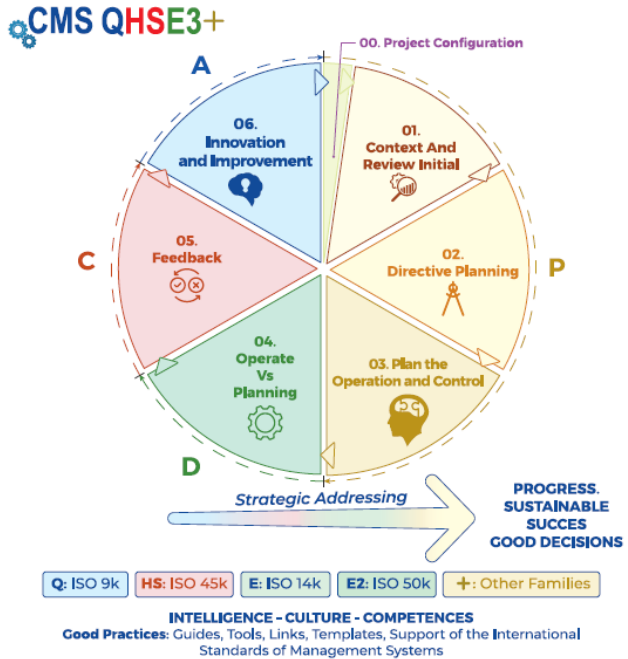
RESUMEN EN INGLÉS

Tesis Doctoral

Pedro Pablo Poveda Orjuela

Director: Prof. Dr. D. Juan Carlos García Díaz

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Abstract

Throughout the evolution and development of humanity, the history of the individual, their community and their culture has been characterized by many efforts focused on the creation of good practices, tools and technologies aimed at reducing vulnerability related to different types of risks.

In the field of quality, food safety, occupational safety and health, environmental management and energy efficiency, these efforts have been consolidated and integrated into instruments for insurance, improvement in performance, and guarantee in terms of requirements for the certification of Management Systems. These instruments are known internationally as ISO Standards, and currently have a wide range of possibilities and models, where the most commonly used correspond to the acronym in English QHSE3+:

- ISO 9001:2015 “Quality management systems — Requirements”, for the **Q** of Quality.
- ISO 45001:2018 “Occupational health and safety management systems – Requirements”, for the **HS** of the Health and Safety.
- ISO 14001:2015 Environmental management systems — Requirements with guidance for use, for the **E** of Environment.

- ISO 50001:2018. Energy Management Systems - Requirements with guidance for use, for the **E2** of Energy Efficiency.

The acronym considers at the end the sign (+), which corresponds to any other referential that may be required from the organization depending on the nature of its operations and the market, or that has relevance according to the nature of the risks of the organization, such as the ISO 21500: 2012 Standards. Guidance on project management, ISO 22000: 2018. International Organization for Standardization. Food safety management systems - Requirements for any organization in the food chain, and ISO 27001: 2013 Information technology - Security techniques - Information security management systems - Requirements.

This Doctoral Research develops a Conceptual Model for Management Systems that cover the references "QHSE3+", under a comprehensive risk approach that includes the energy perspective and other components that may be required, depending on the nature and particularities of the business.

The proposed approach is based on the Systemic Design, and the development and application of tools aimed at facilitating its application and implementation in different companies, under simple applications in Excel. The structure of this Doctoral Thesis is summarized in six chapters, configured as described below:

Chapter 1 contains the introduction and presentation of the principles and elements of comprehensive management, risk management and the approach associated with the acronym "QHSE3+", to then cover the background corresponding to Management Systems and their associated requirements, having taking into account the components of quality Q, safety and health at work HS, environmental management E, and energy efficiency E2, considering the integral management of risks and the approaches of ISO 31000: 2018, under an approach in which the state is presented of art, both in the development of the standardization committees of the families of associated standards, as well as in terms of Biosafety and Biosecurity Management, Business Continuity, and research and advances in comprehensive and risk management. Chapter 1 ends with the presentation of the research objectives.

Chapter 2 describes the general methodology used for the development of research, and then the considerations applied in the study of the state of the art, the retrospective field work, the principles and the sources that frame the research, the configuration of the conceptual model, the analysis of the requirements, the diagnosis of the system, and the methodology for the planning and development of the QHSE3+ SGI implementation project.

Chapter 3 presents the results of the design of the Conceptual Model of the SGI QHSE3+, and its structural, functional and operational characteristics, as well as the Integral Risk Management Model immersed in the SGI QHSE3+.

Chapter 4 includes the presentation of the sequence of application of the model, in projects of implementation or consolidation of the Integral Management

System, taking into account the detailed phases of the implementation route already described in Chapter 2, taking into account the results of the Diagnosis and Initial State Review, Context Analysis, Project Planning and Administration Management, Competency Development, Directive Planning and Operational Planning; the Application of the planned provisions, the Manual of the SGI, the Management of the Change, of the Knowledge and the Documentation, the Feedback with Audits, Management of Monitoring, Measurement, Analysis and Evaluation "MMAE", and finally, the Management of Response to the Feedback, including Business Continuity Management, the Preparation and Response to Contingencies, the Investigation of Incidents, the Corrective, Preventive and Continuous Improvement Actions, to finally close the loop with the Update of the Plans and Control Measures, and the Improvement of products, services and processes.

Chapter 5 contains the Balance of Qualitative and Quantitative Results of the preliminary application of the model. Finally, **Chapter 6** shows the conclusions obtained in each of the previous chapters and presents the possible future lines of research.

In the **Annexes**, the reference to the illustrations used in the Thesis Report has been included, and the technical reference to the files with: The vocabulary, the summary tables for grouping the vocabulary by topic blocks associated with each component, the Tools and Generated Templates, Application Examples, Guides, and finally, the reference to the file *"A voice from TC 176 Interview with Leopoldo Colombo"*.