

## Innovative Integrated Management System (IIMS) for Sustainable Food Industry

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### ABSTRACT

*It is evident that the long-term survival and growth of global food industry depend on the availability and efficient use of raw materials, energy and water and other facilities under the concept of sustainable practice, i.e. in environment, society and economics. Quality and safety managements are essential to ensure that the industry can continue to support the communities in which it operates. Awarding a number of certifications to show the high standing of international quality and hygiene characteristics are currently necessary, e.g. ISO 9001 : 2000, GMP/GHP, HACCP, ISO 22000, BRC and etc. To minimize the cost and maximize the efficiency, the Innovative Integration Management System (IIMS) has been implemented effectively under the frameworks of sustainability in a numbers of national and international food production companies in Thailand during the past years. This will allow the organization to integrate all common processes such as management review, document control, record control, training, monitoring & measuring, data analysing, internal audits, and corrective and preventive actions whereas the critical or specific processes required by each standard are still retained harmoniously with the others.*

**Keywords:** Innovative Integration, Management System, IIMS, Food Sustainable Industry, Quality, Food Safety.

### 1.0 Introduction

Sustainable industry is industry that enhances the sustainable development. Sustainable development was defined by the World Commission on Environment and Development in 1987 as "is about meeting the needs of the present without compromising the ability of future generations to meet their own needs." From the Thailand's National Research Project entitled "Thailand's Sustainability Industry" conducted during 2007 by Prasert Suttiprasit and others, it was figured that the major strategies for the sustainable industry are to cover the aspects of (1) environment, (2) society and (3) economics. In addition to these aspects, more suitable and effective law and regulations are essential.

UK food industry sustainability strategy published in 2006 is an example of the dominant model for international food sustainable industry. Regarding this international food sustainable industry, the UK Government set out the strategy to cope the environmental, social and economic aspects along the food supply chain as the followings

- a. Environmental aspect (1. Energy use and climate change, 2. Waste, 3. Water and 4. Food transportation)
- b. Social aspect (1. Nutrition and health, 2. Food safety, 3. Equal opportunities, 4. Health & Safety and 5. Ethical trading)
- c. Economic aspect (1. Science-based innovation, 2. Workforce skills and 3. Tackling retail crime)

To maintain the efficiency and effectiveness of the Food Industry either in UK or Thailand or in any countries; analysis, action and control measures as well as the corrective and preventive actions should be integrated planned, implemented, evaluated and improved continually through out the food supply chain.

## **2.0 The Needs of the Novel System for Food Sustainable Industry**

Regarding the food that is an essential of human life, the concern related to safety and suitability for consumption is the major immersing critical issues for the social aspect at the international level since outbreaks of foodborne illness can damage trade and tourism, and lead to loss of earnings, unemployment and litigation. Food spoilage is wasteful, costly and can adversely affect trade and consumer confidence. To cope this issue, HACCP (Hazard analysis critical control points) in which was firstly established in the USA 4 decades ago as the preventive mechanism for safety control of foods has been worldwide adopted into the production and service of food industry. The common one for all nations in general format was adopted and revised by the Codex Alimentarius commission of the Joint FAO/WHO Food Standards Program in 1997 and amended thereafter in 1999 and lately in 2003. The quality management system standard, i.e. ISO 9000 has been implemented to control the food production process purposing to ensure the quality food products. Later on the majority of European, U.S. and other global retailers, and brand owners will only consider business with suppliers who have gained certification to the appropriate retailers' standard such as SQF 2000, BRC, IFS and GFSI (Pangat, 2011).

In order to meet the global needs and expectations described above, most food companies in the earlier days implemented each standard (ISO 9001, GMP/GHP and HACCP, and other standards such as BRC and ISO 22000) separately. Hence, the resource requirement particularly human resource was somewhat very high. Too much documents and records had to be formulated and controlled. To resolve this problem, there have to be an integrated approach that will be imperative for organizations to have flexibility in their systems' design and management in the range of disciplines covering all standards in which they have to implement. Besides, the new integrated approaches have to be flexible and modernized enough for integrating the later implementation of standards and quality tools. The innovative integration approaches to the ISO 9001: 2000, Codex Hygiene (GMP/GHP and HACCP), BRC, and ISO 22000 for food industry by merging of both requirements and processes needed for each standard were initiated and successfully implemented in the companies for food sustainable industry.

## **3.0 Concept of Innovative Integrated Management System (IIMS)**

Innovative Integrated Management System (IIMS) is the modernized and flexible management system that utilizes core business processes, both management and technical, to effectively manage and meet its business objectives. The IIMS describes the way of the organization business management by merging of both requirements and processes needed for all standards and quality tools. This will allow the organization to integrate responsibilities and centralize control the common processes such as management review, document control, record control, training, monitoring & measuring, data analysing, internal audits, and corrective and preventive action. However, the critical or specific processes required by each standard or quality tool are still retained harmoniously with the others. All departments within the organization reside within at less one of these business processes.

Implementing the IIMS is suitable for all organizations seeking to develop and continually improve performance across their business through management systems such as those for quality, environment, health & safety, information security and others. The organization could achieve a reduction in everything

from top management time to internal audits to forms used. With IIMS, the organization can also reduce the number of man-days and assessment visits of the Registration/Certification Body. This will save the organization time and money as well as provide the advantages that management systems offer the organization over competitors. The key benefits of implementing IIMS include (1) continuity of working practice (2) reduction of resource requirement (3) reduction of management costs and time (4) unity of on-site processes and (5) customer satisfaction and competitive edge.

The IIMS can be apply directly to all types of food production industry organizations as well as the organizations within the food industry chain ranging from feed producers, primary producers, food manufacturers, transport and storage operators, sub-contractors to retail and food service outlets, together with inter-related organizations such as producers of equipment, packaging materials, cleaning agents, additives and ingredients. It is applicable to all organizations, regardless of size, which are involved in any aspect of the food chain and want to implement systems that consistently provide quality safe products.

The IIMS have to have an comprehensive scope covering all areas of product safety and legality, the Standard addresses part of the due diligence requirements of the target consumers and other interesting parties along the food chain. It is based on the proven principles of the popular Plan – Do – Check – Act cycle. The system improvement goals are regularly monitored (monthly, quarterly or annually) to determine its efficacy in creating cost savings and reducing non-conforming products and delivery.

#### 4.0 Road Map to Achieving the IIMS and Documentation

In order to establish and implement the IIMS effectively, the 9 steps that had been developed and used by the author for years can be applied as the followings:

- Step 1: Analysis of Company Status.** Firstly the food company has to evaluate it status, i.e. it strengths-weaknesses-opportunities-treats, in order to determine the company vision/mission and strategy in the next step.
- Step 2: Defining the Company Vision/Mission and Strategy.** Up on the completion of the food company status analysis, the consensus vision/mission and strategy have to be formulated correctly.
- Step 3: Identifying Company Processes.** All food company processes must be identified and verified. The interaction among processes has to be identified. These should be presented in form of flowcharts and their associated standard operating procedures (SOP's) that corresponds to the requirements of ISO 9001 : 2000, GMP & HACCP and should be linked to the company vision/mission and strategy.
- Step 4: Simplifying.** The rapid rise of process reengineering has tended to merge two very different process management activities. The first is process simplification: the relentless effort to identify and eliminate non-value adding activities in a process. The second, very different reengineering activity is process redesign as described in Step 9.
- Step 5: Characterizing.** This step refers to process performance measurement or metrics. A process can be characterized by an appropriate set of results called “Key Performance Indicators, KPIs.” KPIs reflect the output of the process in terms related to its customer's explicit requirements. They often are the critical factors in determining process efficiency. Usually, the process mapping has to be carried out in order to make the completion in this step.
- Step 6: Monitoring.** The monitoring step assures that the metrics associated with the process have been established and maintained. Hence, the fraction of output that fails to meet customer requirements can be controlled. Besides, continual improvement can be processed.

- Step 7: Determining for Improvement.** At the appropriate period of time, top management or the responsible person has to determine whether the process is needed to be re-designed in order to achieve or maintain competitive leadership. Process redesign is very expensive in both fiscal and human capital terms. It is known that defects are highly contagious but a newly redesigned process often generates the same defects as the old one. Thus, top or process management of the food company must ebb and flow between redesign and incremental improvement.
- Step 8: Improving (PDCA).** Incremental improvement is the essence of evolution and an ever-present human activity, ongoing since the very dawn of humankind three million years ago. To date the classic P-D-C-A principle still be active and good for all Integrated Quality + Hygiene + Food Safety Processes.
- Step 9: Re-designing.** If incremental improvement yields diminishing absolute returns, re-designing has to be the choice.

During the Identifying Company Processes (Step 3), all requirements of each standard were critically interpreted and compared to each others in details resulting into the Application Matrix. This means that all standards are integrated into single system by merging of both requirements and processes. It is the bottom line that the company should minimize the amount of documentations; having only the integrated documentation system complying with the process approach model. The list of the topic presented in the Company's Integrated Quality and Hygiene Manual are followings:

1. Introduction
    - 1.1 Company Profile and Development of Integrated Quality & Hygiene System
    - 1.2 Policy and Objectives
    - 1.3 Control and Review of Manual
  2. Organization Management System
    - 2.1 Organization Structure, Responsibility and Authority
    - 2.2 Management and Customer Focus
    - 2.3 Management Representative and Related Working Committees
    - 2.4 Control of Organization Management System and Management Review
  3. Application of ISO 9001: 2000, ISO 22000: 2005, Global Standards BRC – Food (2005) and International Standards of CAC/RCP 1-1969, Rev 4-2003
    - 3.1 Definition
    - 3.2 Requirement Interaction (1) ISO 9001: 2000 (2) ISO 22000: 2005, (3) BRC – Food and (4) CAC/RCP 1-1969, Rev 4-2003 with Production Process
  4. Integrated Production System and Floor Plan Diagram
  5. Resource Management and Environmental Standard
  6. Production System Hygiene and Prerequisite Programs
  7. Hazard Analysis and Critical Control Points
  8. Action Systems of Control-Correction-Measurement/Analysis and Preventive Action
- Annex: Procedures

Key to success is having clear, simple targets that provide measurable outcomes and milestones along the way. Knowledge management are a central issue of the innovative integration management system that will require continuous rebuilding, updating and innovation within the different areas of the management system. Without having personally and collectively integrated the related values, the desired behaviour will not last; it will only occur incidentally and will not be manifested for long. Culture is seen as an

important enabler for improvements of performance. The biggest common success factor was figured to be the degree of involvement of top management. Those companies that had a fully committed and informed top management team were able to quickly implement the innovated system and realized the greatest savings in time and money, as well as in continual process improvements.

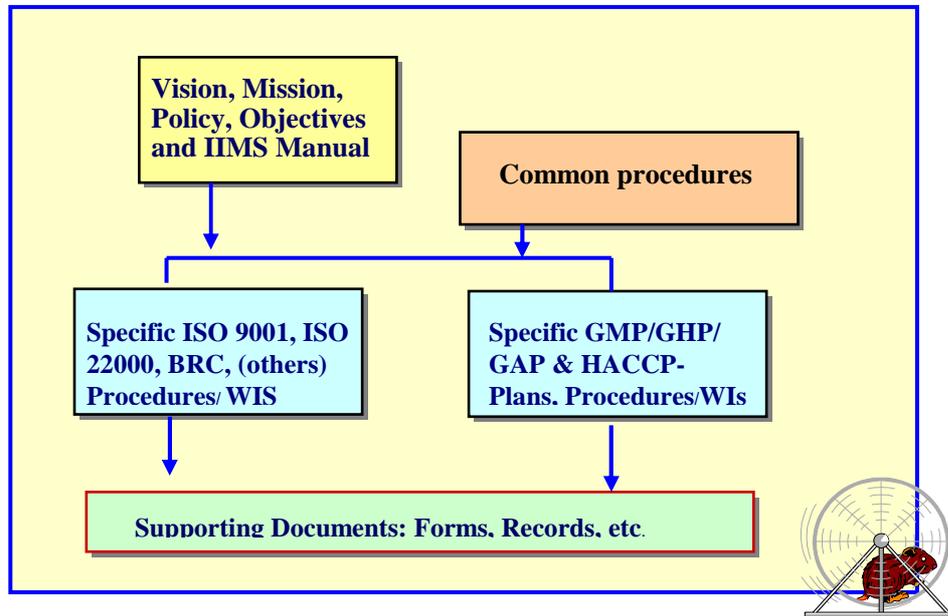


Fig. 1 IIMS Documentation Structure

It was also indicated that savings in the implementation time are due to the centralized approach to innovated system implementation, i.e. primarily: sharing of implementation lessons learned, application of best management practices customized to suit their culture, application of appropriated best practices, and, development of a complete series of templates shared across all organizations.

## 5.0 Concluding Remarks

Food Quality and Safety are the extremely critical issues for the Food Sustainable Industry that affect its role in the society aspect. Any activity that creates value for a food company and its customers, be it a product or service, is linked within the company as part of interacting sets of processes. There are interacting processes at many levels throughout the food company, from the large scale manufacturing of products to the mid-scale and to the small scale manufacturing of products' minor parts. It is the linkage of these processes that directly impact the operating costs and ultimately, quality & safety of the food products reflecting customer satisfaction. Good organizational process model for the food industry is extremely organized in cohesion development of goals from the workers to the top manager with the scope of ISO 9001 : 2000 + ISO 22000 : 2005 + GMP + HACCP + BRC + other standards. On the other hand, lack of appropriate system of processes could increase cycle time, make products more expensive, create defects related to food quality & safety and ultimately reduce value to customers and the society.

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## Author's Background

**Prof. Prasert Suttiprasit, PhD**, International Chief Expert, Lead Auditor, Senior Consultant, Director and Professor at Sukhothai Thammathirat Open University (STOU), Thailand. Prof. Suttiprasit got a Ph.D. from Oregon State University, U.S.A., where he was also the recipient of the 1992 Ernest H. Wiegand Outstanding Teaching Award. Prof. Suttiprasit was trained and certified for Quality and Environmental Management Systems Lead Auditor in Australia as well as for Food Hygiene & Safety Management Systems Lead Auditor in Malaysia. He also certified for BRC and ISO 22000 Lead Auditor from U.K. Prof. Suttiprasit presented the papers in the International Conferences in various countries. In 2004 he was the recipient of the ICDE World Conference Award organized in Hong Kong and thereafter in 2006 he was the APBEST Award Winner for Individual. During the past years, he provided consultancy to many Thai companies and public organizations to achieve the ISO 9000 & other certificates such as GMP, HACCP, BRC, ISO 14001 and ISO 22000 for the food industry. He initiated the Innovative Integrated Management System (IIMS) as well as the Current Process Model (cPM) and had them be implemented in a number of the international and national Thai companies including the food companies. In addition, he was also the executive advising board member and lead auditor for a number of international certified bodies.