



Australian Government

Department of Education, Employment and Workplace Relations

MTMPSR604A Manage effective operation of meat enterprise cold chain and refrigeration systems

Release: 1

MTMPSR604A Manage effective operation of meat enterprise cold chain and refrigeration systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers the skills and knowledge required to plan and oversee the effective operation of enterprise cold chain and refrigeration systems to ensure product quality and food safety. It also covers ways to manage and reduce the costs of cold chain operations. Cold chain systems and operations are critical to the quality and food safety of enterprise products and their efficient management will help minimise the cost of production and maintain regulatory compliance.
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Application of the Unit

Application of the unit	<p>This unit is applicable to production managers, plant engineers, Quality Assurance (QA), maintenance and chiller managers or coordinators.</p> <p>At this level individuals exercise considerable responsibility and accountability within enterprise structures and are required to make primary contributions to the values, goals and operations of the enterprise. They will typically have responsibility for the establishment and review of systems for the site or department. They may work with the assistance of external experts to develop plans and strategies.</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<p>1. Assess enterprise <i>cold chain system</i> requirements</p>	<p>1.1. Enterprise goals, directions and forecasts are analysed and the implications for cold chain requirements are determined.</p> <p>1.2. Enterprise refrigeration systems, cold chain, technical support team and operations are documented.</p> <p>1.3. Regulatory and customer requirements relating to the operation and maintenance of refrigeration systems are identified.</p> <p>1.4. Enterprise requirements for specialised refrigeration advice and expertise are determined.</p> <p>1.5. <i>Optimum refrigeration requirements</i> to maintain quality and safety of products are determined.</p> <p>1.6. Performance standards and targets including standards related to food safety, cost, quality and waste are established.</p>
<p>2. Manage and control cold chain systems</p>	<p>2.1. Procedures for the hygienic and safe operation and maintenance of refrigeration or cold chain systems are developed according to quality, food safety, manufacturer specifications, and customer and enterprise requirements.</p> <p>2.2. Contingency plans and procedures for systems failure or overload are prepared and conveyed to relevant personnel.</p> <p>2.3. Emergency procedures and plans are prepared and included in health and safety systems, procedures, training and work instructions.</p> <p>2.4. Strategies for communicating and resolving systems problems and failures with <i>stakeholders</i> are prepared.</p>
<p>3. Monitor refrigeration and cold chain system performance</p>	<p>3.1. Performance information requirements and data collection strategies are determined and developed.</p> <p>3.2. Monitoring procedures for the operation of refrigeration or cold chain systems are established and maintained.</p> <p>3.3. Non-conformances are investigated, reported where required, and corrective actions implemented.</p> <p>3.4. Preventative and control procedures are developed and implemented to prevent future non-conformance.</p>
<p>4. Improve refrigeration system <i>performance</i></p>	<p>4.1. Performance data is analysed and measured against performance standards, including product quality and cost requirements.</p> <p>4.2. Energy costs of refrigeration systems are calculated</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>and monitored.</p> <p>4.3. <i>Strategies for improving performance</i> and minimising costs are developed and implemented.</p> <p>4.4. Refrigeration system requirements are included in budgets and forward planning.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Ability to:

- assess requirements for enterprise refrigeration or cold chain systems based on enterprise goals, directions and forecasts, detailed product knowledge and regulatory requirements
- apply calculation skills and budget principles to refrigeration costs
- apply relevant communication and mathematical skills and processes including, as appropriate:
 - assertiveness, persuasion and negotiation skills
 - face-to-face, technological and electronic methods
 - communicating in sensitive, conflictive, collaborative and supportive environments
 - analysing and presenting complex concepts, technical information, mathematical information and other data in simple or complex formats
 - complex actual and hypothetical technical and financial modelling, calculations, interpretation or analysis
- develop and maintain the operating system
- prepare manuals and procedures for the operation of refrigeration systems, chillers and freezers according to hygiene, safety, quality and customer requirements and determine corrective actions for systems variations and non-conformances
- identify key personnel for the resolution and communication of systems problems and failures
- maintain currency of knowledge through independent research or professional development
- maintain the quality of products in the cold chain by monitoring chillers or freezers and interpreting refrigeration data to maintain appropriate temperature or humidity for product types and quantities
- manage maintenance of enterprise refrigeration systems including the negotiation

REQUIRED SKILLS AND KNOWLEDGE

- and preparation of maintenance schedules; monitoring repairs; conformance with regulatory and quality requirements; and replacement requirements
- manage refrigeration costs by monitoring the costs of refrigeration including internal or external service models, maintenance costs, lost time costs, product losses and energy costs, minimising energy costs
 - monitor and report system performance including setting performance standards and measures for refrigeration system, consistent with enterprise goals and products, analysing performance information and making recommendations for systems improvement for inclusion in enterprise forward planning
 - operate refrigeration or cold chain systems efficiently including identifying and implementing strategies for reducing heat load in enterprise chiller or freezer, minimising energy costs, maximising availability and minimising down time, maintaining temperatures according to quality and food safety requirements
 - prepare safety procedures for chillers or refrigeration systems including emergency plans and procedures for incidents and accidents associated with refrigerants (leaks and spills) and procedures for the safe and efficient operation of equipment (e.g. forklifts and lights) in chillers and freezers
 - take action to improve own work practice as a result of self-evaluation, feedback from others or in response to changed work practices or technology
 - utilise information and communications technology including statistical and modelling software for research, data collection and analysis, and reporting

Required knowledge

Knowledge of:

- refrigeration concepts and terms including:
 - ambient temperature
 - Biot number: ratio of conductive (internal) resistance to heat transfer to the convective (external) resistance
 - half cooling time
 - surface heat transfer
 - thermal properties of meat including conductivity
- strategies for reducing heat loads, such as:
 - air curtains
 - automatic door closers
 - improved insulation to prevent heat filtration through wall
 - no lights, people, machinery inside
 - plastic strips
 - removal of heat load caused by fans
- impact of high and/or low humidity on eating quality, production and storage of meat and meat products
- impact of moisture transfer during chilling and freezing on quality, production and

REQUIRED SKILLS AND KNOWLEDGE

- storage of meat and meat products
- impact of packaging on chilling and freezing rates of meat and meat product
- concept of heat load and the implications for product quality and energy requirements for refrigeration system
- methods of chilling and freezing meat and meat products including:
 - air (e.g. natural convection, forced convection and spray chilling)
 - air freezing
 - contact freezing
 - cryogenic (e.g. gaseous, solid and liquid - liquid nitrogen and solid carbon dioxide)
 - cryogenic freezing
 - direct contact (e.g. plate freezing and conduction)
 - direct freezing systems
 - liquid immersion (e.g. chilled water or glycol solution)
- impact of chilling or chilling rates and freezing or freezing rates on quality, production and storage of meat and meat products
- qualities of humidity including changes in evaporation, pH levels, saturation humidity, saturation vapour pressure
- thermal properties of meat and meat products and the implications for meat quality
- relevant Occupational Health and Safety (OH&S) and workplace requirements
- relevant food safety requirements and reporting responsibilities
- identify enterprise requirements for refrigeration system including evaluating requirements for specialist personnel and expertise for management and maintenance of refrigeration system; and evaluating different methods of chilling and freezing for cost, efficiency and impact on product quality
- hygiene and sanitation requirements for operation, cleaning and maintenance of cold chain systems
- processes and methods for chilling and freezing meat and meat products and their impact on product quality, food safety and tenderness
- relevant regulatory requirements including food safety regulations and the implications for the management of the enterprise refrigeration or cold chain systems
- OH&S requirements related to the safe handling of refrigerants and safety in controlled atmosphere and confined spaces
- main elements of the compression cycle (compressor, evaporator, condenser, refrigerant) used in refrigeration

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

The meat industry has specific and clear requirements for evidence. A minimum of three forms of evidence is required to demonstrate competency in the meat industry. This is specifically designed to provide evidence that covers the demonstration in the workplace of all aspects of competency over time. These requirements are in addition to the requirements for valid, current, authentic and sufficient evidence.

Three forms of evidence means three different kinds of evidence - not three pieces of the same kind. In practice it will mean that most of the unit is covered twice. This increases the legitimacy of the evidence.

All assessment must be conducted against Australian meat industry standards and regulations.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Competency must be demonstrated through sustained performance over time, at an appropriate level of responsibility and authority under typical operating and production conditions for the enterprise.

Context of and specific resources for assessment

Resources may include:

- a real work environment
- relevant documentation such as:
 - customer specifications
 - manufacturer's instructions and operations manuals
 - QA manuals
 - regulatory requirements
 - workplace policies and procedures
- relevant equipment and materials.

Method of assessment

Recommended methods of assessment include:

- a third-party referee report of sustained performance at appropriate level of authority and responsibility
- assignment focusing on understanding and application of principles and theory to workplace

EVIDENCE GUIDE	
	<p>operations</p> <ul style="list-style-type: none">• workplace projects with focus on company environment and conditions. <p>Assessment practices should take into account any relevant language or cultural issues related to Aboriginality or Torres Strait Islander, gender, or language backgrounds other than English. Language and literacy demands of the assessment task should not be higher than those of the work role.</p>

EVIDENCE GUIDE

Guidance information for assessment

A current list of resources for this unit of competency is available from MINTRAC www.mintrac.com.au or telephone 1800 817 462.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Cold chain systems include:

- chillers
- freezers
- other temperature controlled areas.

Cold chain may extend from point of slaughter to retail outlet and include transportation.

Optimum requirements for enterprise refrigeration systems may relate to:

- technical requirements (e.g. heat load transfer and efficiency) for efficient and cost-effective systems, and capacity to meet enterprise production, product and food safety requirements.

Stakeholders may include:

- company owners, directors, shareholders, financiers
- competitors
- refrigeration specialists
- management and employees
- suppliers, customers, consumers
- unions and employer associations
- regulators.

Performance measures for cold chain systems may relate to

- costs
- energy consumption
- food safety and legal
- product quality
- customer specifications.

RANGE STATEMENT	
<p><i>Strategies for improving performance</i> may include assessment of alternative refrigeration strategies such as:</p>	<ul style="list-style-type: none"> • different configurations and types of chillers • repair, upgrade or purchase of new equipment and systems • use of alternative energy sources or alternative refrigeration service models such as: <ul style="list-style-type: none"> • combination of internal and external expertise • external contractors • internal personnel • use of technology.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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