Title	**Describe the prevention of fires and dust explosions in a dairy processing operation**		
Level	**4**	**Credits**	**5**

Purpose	People credited with this unit standard are able to describe: the causes of fires and dust explosions; methods of preventing fires and dust explosions; fire and explosion protection systems, and access rules; and indicators and responses to impending fires, in a dairy processing operation.

Classification	Dairy Processing > Milk Products

Available grade	Achieved

Guidance Information

1 Legislation and regulations relevant to this unit standard include but are not limited to:

- Animal Products Act 1999;
- Health and Safety at Work Act 2015;
- Animal Products (Dairy) Regulations 2005;
  and any subsequent amendments.

2 Definitions
Fire triangle – refers to the combination of oxidant, fuel and ignition source.
Organisational requirements – instructions to staff on policies and procedures which are documented in memo, electronic or manual format and are available in the workplace. These requirements include but are not limited to – site specific requirements, company environmental procedures, company quality management requirements, and legislative requirements.

3 Reference
Approved Code of Practice for the Prevention, Detection and Control of Fire and Explosion in New Zealand Dairy Industry Spray Drying Plant, available on www.standards.govt.nz.

Outcomes and performance criteria

Outcome 1

Describe the causes of fires and dust explosions in a dairy processing operation.

Performance criteria

1.1 Describe a dust explosion in terms of the elements required for an explosion to occur.

Range elements include but are not limited to – the fire triangle, the importance of the dust to air ratio, the lower explosive limit for milk powders, the minimum ignition temperature for milk powders.

1.2 Describe potential sources of ignition of fires and dust explosions.

Range ignition sources may include but are not limited to – self-heating, flames, hot surfaces, friction, mechanical sparks, electrical energy, electrostatic discharge, powder dags;
evidence of four ignition sources is required.

1.3 Describe conditions where explosive dust clouds might arise.

Range conditions associated with work areas, items of equipment, other activities;
evidence of five conditions is required.

Outcome 2

Describe methods of preventing fires and dust explosions in a dairy processing operation.

Performance criteria

2.1 Describe control methods in terms of preventing sources of ignition.

Range ignition sources include but are not limited to – self-heating, flames, hot surfaces, friction, mechanical sparks, electrical energy, electrostatic discharge, powder dags;
evidence of four control methods is required.

2.2 Describe methods of preventing or controlling explosive dust clouds in the work environment in terms of organisational requirements.

2.3 Describe plant checks for safe and unsafe conditions, and any corrective action required in accordance with organisational requirements.

Range plant checks may include but are not limited to – pre-start checks, correct nozzle or disk atomiser assembly, hourly monitoring, daily and once per shift checks, shift handover checks, shut-down or plant-on-water checks, pre and post clean-in-place checks, permit to work checks, carbon dioxide checks, explosion suppression bottles checks;
evidence of four checks is required.

Outcome 3

Describe fire and explosion protection systems, and access rules in a dairy processing operation.

Performance criteria

3.1 Describe a protection system in terms of its purpose.

Range protection systems may include but are not limited to – explosion venting, deluge/sprinkler systems, fire detection systems, fire extinguishers, fire and explosion suppression systems; evidence of four protection systems is required.

3.2 Describe a protection system in terms of operator interactions in accordance with organisational requirements.

Range operator interactions may include but are not limited to – arming, disarming, manual isolations, lock-outs, status checking, routine servicing, equipment location; evidence of four interactions is required.

3.3 Describe protection system alarms in terms of alarm types, common triggers, impact on the plant and responses required in accordance with organisational requirements.

3.4 Describe protection system faults in terms of the common fault messages, impact on the plant and corrective actions required in accordance with organisational requirements.

3.5 Describe hazards associated with workplace situations involving protection systems in terms of actions required in accordance with organisational requirements.

Range situations may include but are not limited to – when plant is operating, that arise when the system activates, when elements of the system are disarmed, associated with maintenance; evidence of one action for each situation is required.

3.6 Describe ‘no-go’ and restricted access areas in the work area in terms of the access rules in accordance with organisational requirements.

Outcome 4

Describe the indicators and responses to impending fires in a dairy processing operation.

Performance criteria

4.1 Describe an impending fire or explosion in terms of the common indicators.

Range indicators may include but are not limited to – burnt powder, smell, charred particles, carbon monoxide, temperature;
evidence of three indicators is required.

4.2 Describe responses and/or corrective actions to specific warning signs of an impending fire or explosion in terms of organisational requirements.

Range responses and/or corrective actions for – burnt powder, smell, charred particles, chemical and heat emissions;
evidence of three responses or corrective actions is required.

4.3 Describe plant emergency response and escalation procedures required in the event of a fire, explosion or a safety system activation in accordance with organisational requirements.

Range responses include but are not limited to – response to a fire, response to an explosion, response to activation of the protection system, roles and responsibilities, procedures in the aftermath of a fire or explosion event.

4.4 Describe methods suitable for fighting a powder fire in terms of organisational requirements.

Range methods include but are not limited to –limitations of installed and manual fire-fighting equipment.

4.5 Describe safety documentation and audit procedures in terms of their purpose.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	5 July 1999	31 December 2014
Revision	2	13 June 2003	31 December 2014
Rollover	3	17 July 2009	31 December 2016
Review	4	18 June 2015	31 December 2024
Review	5	27 May 2021	N/A
Revision	6	26 January 2023	N/A

Consent and Moderation Requirements (CMR) reference	0022

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact the Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.