Title	**Tune control loops**		
Level	**4**	**Credits**	**6**

Purpose	People credited with this unit standard are able to: – demonstrate knowledge of tuning of control loops; – tune control loops; and – demonstrate knowledge of control loop wiring.

Classification	Industrial Measurement and Control > Industrial Measurement and Control - Theory

Available grade	Achieved

Guidance Information

1 Reference
ANSI/ISA-5.1-2009 *Instrumentation Symbols and Identification*;
and all subsequent amendments and replacements.

2 Definition
Industry requirements – includes all asset owner requirements, manufacturers' specifications; and enterprise requirements which cover the documented workplace policies, procedures, specifications, business requirements; and quality management requirements relevant to the workplace in which the assessment is carried out.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of tuning of control loops.

Performance criteria

1.1 Describe primary methods of control loop tuning.

Range initial controller settings, systematic trial and error, ultimate sensitivity, reaction curve.

1.2 Identify correct application and limitations of each tuning method in 1.1 above.

Range fast control loops, slow loops, initial settings.

1.3 Carry out control loop tuning calculations.

Range process reaction curve, systematic trial and error, initial controller settings.

Outcome 2

Tune control loops.

Performance criteria

2.1 Implement control loop operation using initial controller settings.

Range may include – flow, level, pressure, temperature; evidence of two types is required.

2.2 Tune control loops using the closed loop systematic trial and error method.

Range may include – flow, level, pressure, temperature; evidence of two types is required.

2.3 Tune fast control loops using the closed loop ultimate sensitivity method and carry out the appropriate calculations.

Range may include – flow, level, pressure; evidence of one type is required.

2.4 Tune slow control loops using the open loop reaction curve method and carry out the appropriate calculations.

Range may include – level, temperature; evidence of one type is required.

Outcome 3

Demonstrate knowledge of control loop wiring.

Performance criteria

3.1 Interpret control loop wiring diagrams in accordance with industry requirements.

Range pressure, level, temperature, flow.

3.2 Wire a control loop in accordance with industry requirements.

Range pressure, level, temperature, flow; evidence of one of each type is required.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	31 October 1995	31 December 2013
Revision	2	30 October 1997	31 December 2013
Revision	3	3 April 2001	31 December 2013
Review	4	22 June 2001	31 December 2013
Review	5	19 May 2008	31 December 2019
Review	6	28 November 2013	31 December 2027
Rollover	7	28 June 2018	31 December 2027
Review	8	30 January 2025	31 December 2027

Consent and Moderation Requirements (CMR) reference	0003

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