National Certificate in Electricity Supply (Thermal Operator) (Level 4) with strands in Thermal Operations, Combined Cycle Operations, and Geothermal Operations

Level **4**

Credits **105-136 (depending on strand)**

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2020

Transition Arrangements

The last date for entry into programmes leading to this qualification is 31 December 2018. The last date for assessment of programmes leading to this qualification is 31 December 2020, at which time it will be discontinued.

Expired unit standard 17607 has been removed from the compulsory Geothermal Operations Strand. To maintain the overall credit value for this strand, the required elective credits have been increased from 12 to 21.

For detailed information see Review Summaries on the NZQA website.

NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	July 2001	December 2010
Review	2	August 2006	December 2016
Revision	3	December 2006	December 2016
Revision	4	June 2007	December 2016
Revision	5	August 2013	December 2020
Review	6	May 2017	December 2020

Standard Setting Body

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National Certificate in Electricity Supply (Thermal Operator) (Level 4) with strands in Thermal Operations, Combined Cycle Operations, and Geothermal Operations

Level **4**

Credits **105-136 (depending on strand)**

Purpose

This national certificate is awarded to people who have demonstrated competence in the skills and knowledge required for employment as a Thermal Operator in the areas of Thermal Operations, Combined Cycle Operations, and Geothermal Operations in the electricity supply industry.

It caters for trainees within this industry whose primary role is carrying out Thermal Operations on an electricity supply system.

The qualification covers the Thermal Operations of power system equipment including:

- operating compressed air systems
- operating cooling water systems
- operating fixed fire protection and detection systems
- operating auxiliary steam systems
- operating station drains
- operating condensers and condensate systems
- operating turbine oil systems
- operating turbine control fluid systems.

This qualification contains standards that build on the knowledge and skills recognised by the National Certificate in Electricity Supply (Level 2) [Ref: 1293], and will allow candidates to progress to the National Diploma in Electricity Supply (Level 5) [Ref: 0674].

Special Notes

Recognition of prior learning will be carried out by accredited providers or Electricity Supply Industry Training Organisation (ESITO) registered workplace assessors.

Credit Range

Thermal Operations Strand

	Core Compulsory	Strand Compulsory	Strand Elective
Level 3 credits	12	-	0-4
Level 4 credits	46	46	2-12
Level 5 credits	-	-	0-6
Minimum totals	58	46	12
Qualification total with strand	116		

Combined Cycle Operations Strand

	Core Compulsory	Strand Compulsory	Strand Elective
Level 3 credits	12	-	0-2
Level 4 credits	46	60	10-12
Level 5 credits	-	6	-
Minimum totals	58	66	12
Qualification total with strand	136		

Geothermal Operations Strand

	Core Compulsory	Strand Compulsory	Strand Elective
Level 2 credits	-	8	0-8
Level 3 credits	12	-	0-2
Level 4 credits	46	12	0-17
Level 5 credits	-	6	-
Minimum totals	58	26	21
Qualification total with strand	105		

Requirements for Award of Qualification

Award of NZQF National Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided on the New Zealand Qualifications Authority (NZQA) website: http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- Core Compulsory standards

One of the following strands is required
- Thermal Operations Strand
- Combined Cycle Operations Strand
- Geothermal Operations Strand

Detailed Requirements

Core Compulsory
The following standards are required

Engineering and Technology > Electricity Supply > Electricity Supply - Core Skills

ID	Title	Level	Credit
12387	Operate electrical switchgear in the electricity supply industry	4	6
12390	Demonstrate knowledge of electricity supply systems	3	5

Engineering and Technology > Electricity Supply > Electricity Supply - Power System Maintenance

ID	Title	Level	Credit
14700	Apply and remove safety measures in an electricity supply environment	3	3
27655	Demonstrate familiarity with common faults, relay systems, and components of diagrams in power system protection systems	3	4

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17399	Operate compressed air systems in a thermal electricity generation power station	4	4
17400	Operate cooling water systems in a thermal electricity generation power station	4	3
17405	Operate fixed fire protection and detection systems in a thermal electricity generation station	4	6
17406	Operate auxiliary steam systems in a thermal electricity generation power station	4	2
17407	Operate station drains in a thermal electricity generation power station	4	3
17410	Operate condensers and condensate systems in a thermal electricity generation power station	4	4
17412	Operate turbine oil systems in a thermal electricity generation power station	4	5

ID	Title	Level	Credit
17415	Operate turbine control fluid systems in a thermal electricity generation power station	4	5
22876	Operate and monitor a generator and associated systems in a thermal power station	4	8

Thermal Operations Strand
Meet the requirements of all of the following sets
- Thermal Operations Strand Compulsory
- Thermal Operations Strand Elective

Thermal Operations Strand Compulsory
The following standards are required

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17398	Operate gas plant in a thermal electricity generation power station	4	6
17409	Operate and monitor turbine steam systems in a thermal electricity generation power station	4	12
17411	Operate feed heating systems in a thermal electricity generation power station	4	5
17417	Operate boiler feed pump in a thermal electricity generation power station	4	4
17419	Operate boiler air and flue gas systems in a thermal electricity generation power station	4	4
17420	Operate boiler steam and water circuit in a thermal electricity generation power station	4	5
17421	Operate boiler fuel gas and ignition gas systems in a thermal electricity generation power station	4	4
22877	Demonstrate knowledge of steam generation water treatment in a thermal power station	4	6

Thermal Operations Strand Elective
A minimum of 12 credits

Engineering and Technology > Electricity Supply > Electricity Supply - Power System Management

ID	Title	Level	Credit
23409	Utilise a Distributed Control System (DCS) in the operation of an electricity generation power station	5	6

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17401	Operate air conditioning in a thermal power station	4	3

ID	Title	Level	Credit
17402	Operate auxiliary boiler in a thermal electricity generation power station	4	6
17403	Operate nitrogen and carbon dioxide systems in a thermal electricity generation power station	3	2
17404	Operate fuel oil systems in a thermal electricity generation power station	4	3
17408	Operate water treatment systems in a thermal power station	4	8
17414	Operate and monitor steam and water cycle chemistry in a thermal electricity generation station	4	4
17416	Operate boiler feed pump turbine in a thermal electricity generation power station	4	5
17418	Operate boiler fuel oil systems in a thermal electricity generation power station	4	3
17422	Operate soot blowing system in a thermal electricity generation power station	3	2
17423	Operate coal firing in a thermal electricity generation power station	4	6
17424	Operate boiler electrostatic precipitators in a thermal electricity generation power station	4	2
17425	Operate boiler circulating pumps in a thermal electricity generation power station	4	2
20187	Operate ferrous sulphate systems in a thermal electricity generation power station	4	3
20188	Carry out borax nitrate dosing and rinsing in a thermal electricity generation power station	4	3
22878	Operate and monitor a hydrogen cooled generator and systems in a thermal power station	4	6

Combined Cycle Operations Strand
Meet the requirements of all of the following sets

- Combined Cycle Operations Strand Compulsory
- Combined Cycle Operations Strand Elective

Combined Cycle Operations Strand Compulsory
The following standards are required

Engineering and Technology > Electricity Supply > Electricity Supply - Power System Management

ID	Title	Level	Credit
23409	Utilise a Distributed Control System (DCS) in the operation of an electricity generation power station	5	6

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17398	Operate gas plant in a thermal electricity generation power station	4	6
17409	Operate and monitor turbine steam systems in a thermal electricity generation power station	4	12
17414	Operate and monitor steam and water cycle chemistry in a thermal electricity generation station	4	4
17417	Operate boiler feed pump in a thermal electricity generation power station	4	4
22875	Operate a gas turbine and associated systems for electricity generation in a thermal power station	4	16
22877	Demonstrate knowledge of steam generation water treatment in a thermal power station	4	6
22879	Operate heat recovery steam generator (HRSG) in a thermal power station	4	12

Combined Cycle Operations Strand Elective
A minimum of 12 credits

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17401	Operate air conditioning in a thermal power station	4	3
17402	Operate auxiliary boiler in a thermal electricity generation power station	4	6
17403	Operate nitrogen and carbon dioxide systems in a thermal electricity generation power station	3	2
17404	Operate fuel oil systems in a thermal electricity generation power station	4	3
17408	Operate water treatment systems in a thermal power station	4	8
17411	Operate feed heating systems in a thermal electricity generation power station	4	5
17416	Operate boiler feed pump turbine in a thermal electricity generation power station	4	5
22878	Operate and monitor a hydrogen cooled generator and systems in a thermal power station	4	6

Geothermal Operations Strand
Meet the requirements of all of the following sets

- Geothermal Operations Strand Compulsory
- Geothermal Operations Strand Elective

Geothermal Operations Strand Compulsory
The following standards are required

Engineering and Technology > Electricity Supply > Electricity Supply - Power System Management

ID	Title	Level	Credit
23409	Utilise a Distributed Control System (DCS) in the operation of an electricity generation power station	5	6

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17409	Operate and monitor turbine steam systems in a thermal electricity generation power station	4	12

Manufacturing > Energy and Chemical Plant > Operation of Energy and Chemical Plant

ID	Title	Level	Credit
17609	Operate geothermal binary turbines on energy and chemical plant	2	8

Geothermal Operations Strand Elective
A minimum of 21 credits

Engineering and Technology > Electricity Supply > Electricity Supply - Thermal Operations and Control

ID	Title	Level	Credit
17401	Operate air conditioning in a thermal power station	4	3
17403	Operate nitrogen and carbon dioxide systems in a thermal electricity generation power station	3	2
17434	Operate circulated cooling water systems from a thermal electricity generation control room	4	8
22878	Operate and monitor a hydrogen cooled generator and systems in a thermal power station	4	6

Engineering and Technology > Mechanical Engineering > Engineering Core Skills

ID	Title	Level	Credit
2395	Select, use, and care for, engineering hand tools	2	4
2396	Select, use and maintain portable hand held engineering power tools	2	4

Transition Arrangements

Version 5

This qualification was revised and issued as version 5 to remove expiring unit standard 19481from the compulsory section and expired unit standards 10405 and 10406 from the Geothermal Operations Strand.

Changes to structure and content

- Overall credits have been amended for the Thermal Operations Strand from 114 to 116, Combined Cycle Operation Strand from 134 to 136, and Geothermal Operations Strand from 103 to 105.
- Unit standard 19481 was removed from the compulsory set and replaced with unit standard 27655.
- Expired unit standards 10405 and 10406 were removed from the Geothermal Operations Strand and not replaced.

For detailed information see Review Summaries on the NZQA website.

All existing candidates may either complete the version of the qualification on which they are enrolled or transfer their existing achievements to version 5. All new trainees will be enrolled in programmes leading to version 5 of the qualification.

This qualification contains a standard that has been substituted for an earlier standard. For the purposes of this qualification, people who have gained credit for the expiring standard are exempt from the requirement to gain credit for the replacement standard – see table below.

Credit for	Exempt from
19481	27655

It is not intended that anyone is disadvantaged by this revision and the above arrangements have been designed for a smooth transition. Anyone who feels they have been disadvantaged may appeal to ESITO at the address below

Previous versions of the qualification

Version 4 was issued in order to correct the total credit range, amending it from 101-134 to the correct amount of 103-134. The transition section was amended to simplify the detailed listing of differences between earlier qualification versions and the prerequisite diagram updated. There were no changes made to the structure of the qualification.

Version 3 was revised and issued in order to substitute unit standard 18422, which was specific to the petrochemical sector, with the new unit standard 23409 that covers the use of a Distributed Control System (DCS) in an electricity generation power station.

Version 2 was reviewed and issued in order to better reflect industry needs for flexible and achievable qualifications that support learning and progression. The Co-generation

Operations strand was removed and a Geothermal Operations strand added, and the title amended accordingly.

Other standard setting bodies whose standards are included in the qualification

Competenz
NZ Motor Industry Training Organisation - NZ Extractive ITO (EXITO)

Certification

This certificate will display the logo of NZQA, the Electricity Supply Industry Training Organisation and the organisation that has been granted consent to assess against standards that meet the requirements of the qualification.

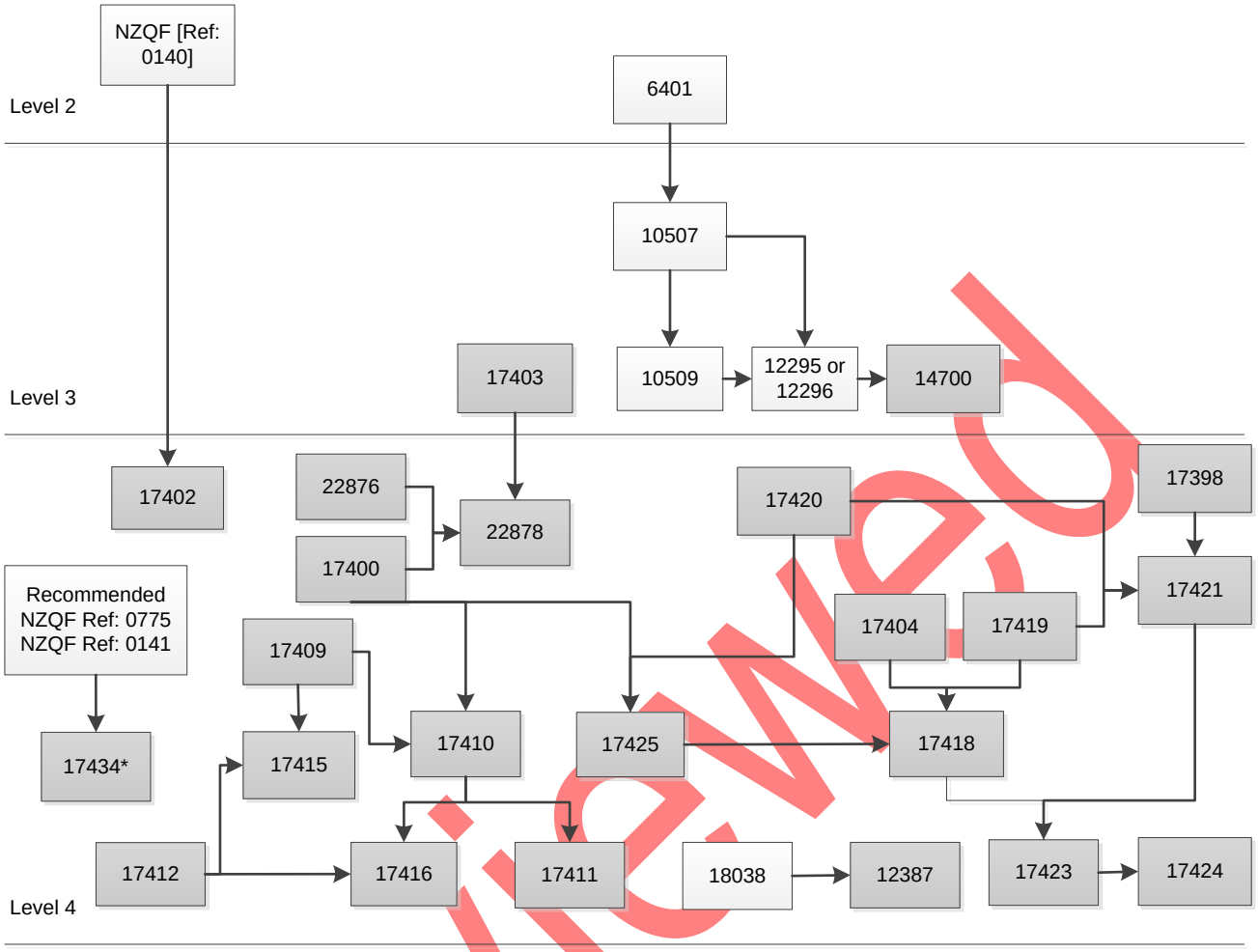
Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		**NZSCED**	
Code	**Description**	**Code**	**Description**
318	Engineering and Technology > Electricity Supply	031399	Engineering and Related Technologies > Electrical and Electronic Engineering and Technology > Electrical and Electronic Engineering and Technology not elsewhere classified

Quality Management Systems
Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.

Prerequisite Diagram



Key

Standards included in qualification

NQF Ref: 0775 - National Certificate in Energy and Chemical Plant (Process Operation-Boiler Attendent) (Level 2)
NQF Ref: 0141 - National Certificate in Energy and Chemical Plant (Process Operation) (Level 4)
* Unit standard 17434 will be revised to update its recommended entry requirements