New Zealand Steel

Participant Rolling Outage Plan

8 April 2026

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Definitions

Authority	The Electricity Authority
Code	The Electricity Industry Participant Code 2010
Developing Event	An event that evolves over time that could cause a supply shortage, e.g. as the result of an extended period of reduced generating capacity.
EMP	The System Operator's Emergency Management Policy. Current version effective from 1st December 2022
GXP	Transpower Grid Exit Point at which the NZS Glenbrook load is connected
GEN	Grid Emergency Notice
Immediate Event	An event that occurs with little or no warning that could cause a supply shortage, e.g. as a result of an unexpected outage of a major transmission line or generating plant.
NZS	New Zealand Steel
PROP	Participant Rolling Outage Plan (this plan)
Rolling Outages	Planned electricity disconnections spread over different parts of the electricity system at differing times to avoid prolonged outages at any one location.
SOROP	System Operator rolling outage plan
Supply Shortage Declaration	Declaration made by the System Operator under Clause 9.14 (2) of the Code.
System Operator	Operator of the national electricity transmission grid (Transpower)
Transpower	Transpower New Zealand Limited
Transmission Line	A high voltage supply line owned and operated by Transpower New Zealand Limited.

Associated Documents

1. Emergency Management Policy published by the System Operator, effective from 1st December 2022.
2. System Operator Rolling Outage Plan - published by the System Operator and effective from 1st September 2024.
3. New Zealand Steel operational procedures.

Purpose of This Plan

4. Part 9 of the Electricity Industry Participation Code (the Code) relates to security of supply and includes provisions relating to the System Operator rolling outage plan (SOROP) and participant rolling outage plans (PROPs).
5. This plan was written to satisfy the requirements of the Code that relate to PROPs. Clause 9.8 of the Code requires that each PROP must
   a) be consistent with the System Operator rolling outage plan; and
   b) comply with the requirements specified in the notice sent under clause 9.6(2)(a); and
   c) specify the actions that the specified participant will take to achieve, or contribute to achieving, reductions in the consumption of electricity (including any target level of reduction of consumption of electricity in accordance with criteria, methodologies, and principles specified in the system operator rolling outage plan) to comply with a direction from the system operator given under clause 9.15.
6. This PROP covers the following site:

Site Name	Physical Location	GXP
New Zealand Steel	Glenbrook, South Auckland	GLN0331 and GLN 0332

7. This PROP provides details of how New Zealand Steel (NZS) will respond to a supply shortage declaration issued by the System Operator and how the System Operator (Transpower) should communicate any requests for reductions in demand.
8. The outage plan provides details of the main energy saving measures that can be called on and how these are structured and implemented.

Supply Shortage Declaration

9. Part 9 Sub part 2 of the Code sets out how supply shortage situations will be managed.
10. Under the provisions of the Code, the System Operator has powers to direct outages following a supply shortage declaration. As a specified participant, NZS must comply with any direction given by the System Operator following a supply shortage declaration.
11. A supply shortage declaration may apply to:
    a. All of New Zealand; or
    b. Regions specified in the declaration
12. When a supply security declaration is made, NZS must comply with a direction given by the System Operator in accordance with this PROP.
13. The System Operator may, at any time in the period during which a supply shortage declaration is in force, direct NZS to contribute to achieving reductions in the consumption of electricity by implementing outages or taking any other action specified in the direction.
14. A direction may be communicated through the information system operated by the System Operator.
15. The System Operator will notify NZS when a supply shortage declaration has been revoked
16. This PROP sets out the actions that NZS will take, who is responsible for implementing the actions and how communications will be managed between NZS and the System Operator.

Background

The Electricity Authority

17. The Electricity Authority (Authority) is a Crown entity set up under the Electricity Act to oversee New Zealand's electricity industry and markets. The Authority's objective is to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.
18. The core functions of the Authority are:
    a. make and administer the Electricity Industry Participation Code 2010 (Code) governing the New Zealand Electricity Market;
    b. undertake market facilitation measures (such as providing education, guidelines, information and model arrangements) and monitor the operation and effectiveness of market facilitation measures;
    c. monitor and enforce compliance with the Code, various regulations and the Act;
    d. proactively monitor the performance of the electricity industry in regard to competition, reliable supply and efficient operation; and
    e. contract service providers to operate the New Zealand electricity system and market in accordance with the Code

Transpower

19. Transpower is a State Owned Enterprise, tasked with owning and operating New Zealand's National Grid - the network of high voltage transmission lines and substations that transports bulk electricity from where it is generated to distribution line companies and directly (grid) connected major electricity consumers.

System Operator

20. As System Operator, Transpower manages the real-time operation of New Zealand's electricity transmission system by matching supply (generation dispatch) with demand.
21. A function of the System Operator under the Electricity Act is to use reasonable endeavours to ensure the security of electricity supply. The System Operator's activities include forecasting supply and demand, developing and publishing guideline hydro levels for security of supply and improving the ability of consumers to manage price risks in the market

New Zealand Steel

22. NZS is the only integrated steelmaker and manufacturer of flat rolled steel products in New Zealand and is situated at Glenbrook in South Auckland. Locally mined ironsand and coal deposits are converted into a variety of flat steel products, both for the domestic and export markets.
23. The Company's annual gross usage is ~1035 GWh (average of 118 MW) with ~572 GWh (average of 65 MW) being generated on site via two waste heat power generation schemes. The Company's annual net usage is therefore ~463 GWh (average of 53 MW) and this includes the electricity used by BOC Gases.

Security of supply events covered by this plan

24. In its Emergency Management Policy, the System Operator provides the steps that the System Operator will take and the circumstances that will need to exist for a supply security declaration to be made. Those steps provide for a series of last resort emergency measures, which would not be implemented unless there was a significant risk that it would not be possible to meet the demand for electricity on a sustained basis.
25. The types of events likely to require the implementation of the EMP include an extended period of extremely low inflows to hydro catchments, a major asset outage that was expected to be sustained for a long period, or some combination of these events.
26. The System Operator recognises two categories of events that may lead to a supply shortage declaration: a developing event and an immediate event.
27. Rolling outages under a supply shortage declaration are a last resort measure the System Operator may initiate, after consultation with the Authority, only if there is a shortage of electricity supply (generation) or transmission capacity if the System Operator considers:
    a. that the normal operation of the wholesale market is, or will soon be, unlikely to facilitate the adjustment of supply and demand necessary to ensure that supply matches demand; and
    b. that, if planned outages are not implemented, unplanned outages are more likely than not.

What this PROP Contains

28. This PROP includes procedures for managing both developing and immediate category of events.

Section	Content
Communications	Contact details for communications during a supply shortage declaration.
Description of Load	A description of NZS load.
Site Response	How the site will respond to different types of events including a plan of possible savings.
Coordination with System Operator	Sets out how NZS will coordinate with the System Operator.
Monitoring and Reporting	How NZS will monitor and report savings made.

Communications

All urgent operational communications should, in the first instance, be made to:

1. Energy Balancing Duty Officer, if unable to be contacted, then try:
2. Melter Supervisor

It should be noted that only operational communications directly related to an imminent supply shortage event requiring urgent load reduction should be made to the Energy Balancing Duty Officer or the Melter Supervisor.

The Energy Balancing Duty Officer or Melter Supervisor will communicate with the System Operator for operational communications using the following details:

Transpower National Control Centre Energy Desk Duty - 0800 535 123
Security Desk Duty - 0800 488 500
Email: OperationsManager@transpower.co.nz

Communications from the System Operator about a supply shortage declaration should be made to:

1. Energy Manager - Strategy & Operations, if unable to be contacted, then try:
2. Energy Management Engineer, if unable to be contacted, then try:
3. Energy Balancing Duty Officer

Please refer to an email from NZS to the System Operator regarding NZS contact details.

The NZS person responsible for reporting to the System Operator on performance against savings targets is either:

1. Energy Manager - Strategy & Operations, or
2. Energy Management Engineer

Please refer to an email from NZS to the System Operator regarding NZS contact details.

The person who the System Operator should notify for revocation of the shortage declaration is:

1. Energy Manager - Strategy & Operations, if unable to be contacted, then try:
2. Energy Management Engineer, then try:
3. Energy Balancing Duty Officer.

Please refer to an email from NZS to the System Operator regarding NZS contact details.

Administrative communications with the System Operator (relating to supply shortage declarations, directions to save energy, acknowledgement of receipt of a direction to save energy, rolling outage monitoring, direct consumer load/load shedding forecasts and media/public communications) should be directed (preferably by email) to:

System Operator Transpower Waikoukou
22 Boulcott Street
PO Box 1021
Wellington 3215
Telephone: 04 590 7000
Email: system.operator@transpower.co.nz

The NZS person who is responsible for communicating with the media (if required) is:

Manager - External Affairs

Please refer to an email from NZS to the System Operator regarding the manager's contact details.

Description of Site Load

29. The NZS site at Glenbrook is the 2nd largest industrial user of electricity in the country with an average gross load of ~123 MW with daily average gross loads up to 147 MW. The individual industrial processes at NZS are largely continuous with the balance being batch-type. As a whole, most of the processes are in series i.e. the output of one process is the input to the next process.
30. The major electricity loads on site are:
    a. Iron Plant – 19 MW on average. Comprises the Raw Materials Handling facility plus the four multi-hearth furnaces and the four kilns. The site has two fully embedded waste heat power generation schemes (owned and operated by Alinta ENZ Ltd) which average a total of 71 MW (with very occasional peaks up to 100 MW) and they are located in this area. In the Iron Plant, iron sand and coal are converted into reduced primary concentrate and char (RPCC) prior to being fed to the melters. The Iron Plant is a continuous operation.
    b. Melters 1&2 – total of 74 MW on average with peaks occasionally up to 90 MW. The melters convert the RPCC from the Iron Plant into liquid iron. NZS offers the melters' load (normally 70 MW) into the Reserves Market both as FIR and SIR. The melters are both continuous operations.
    c. Steel Plant – 3 MW on average. In the Steel Plant, the liquid iron from the melters is converted into liquid steel and then cast into slabs and billets. Vanadium is extracted as a byproduct from the liquid iron. The Ladle Metallurgy Furnace is part of the Steel Plant. The Steel Plant is a series of batch operations.
    d. Rolling Mills – 11 MW on average. In the Rolling Mills, the Hot Strip Mill rolls the slabs into flat strip and the Cold Mills (4Hi and 6Hi) roll the strip to its final thickness and improves its surface quality.

The Hot Strip Mill is the largest of these loads, averaging ~8 MW. The individual plants in the Rolling Mills are a series of batch operations.

e. Finishing Plants – 10 MW on average. The Finishing Plants comprise the Metal Coating Line and the Colour Coating Line which produce Zincalume and Colorsteel respectively. All these products are then sold to others. The Metal Coating Line is the largest of these plants, averaging ~8 MW. All these plants operate continuously.

f. BOC Gases – average of 8 MW. BOC Gases' Air Separation Unit (ASU) is situated next door to NZS at Glenbrook. NZS purchases electricity on behalf of BOC Gases for its ASU and for this exercise, it is considered to be part of NZS' load. This plant operates continuously. As well as NZS, it supplies gases to other customers.

31. On-site generation is provided by three generation units which average a total of 65 MW between them. Due to this generation, the expected normal net demand seen on the transmission grid is 53 MW. However, the peak net demand seen on the grid can be approximately 120 MW for a few trading periods when the largest generation unit fails unexpectedly (in practice, extremely rarely).

How the site will respond to different types of events

Immediate & Developing Event

32. The System Operator is responsible for making a supply shortage declaration and for directing NZS to implement rolling outage savings.
33. Reasonable endeavours will be used to provide a week ahead rolling outage plan per GXP and a week ahead forecast of half hourly load per GXP for any conforming GXPs and updated bids for the week ahead via WITS for any non-conforming GXPs. This information will be forwarded to the System Operator by email on a daily basis (or via WITS for bids), once savings targets have been notified or updated. The rolling outage plan will contain daily outage start and restore times per GXP.
34. If a net site load reduction is required for any reason, Kilns Cogen is always fired with extra natural gas first with a resultant Company net load reduction of nominally 9 MW (or ~17% of the site net load), the actual amount is uncertain and is dependent on Iron Plant production conditions at the time. Over the period of a week, the average net load reduction should be also approximately 9 MW or 1.5 GWh if full iron production is maintained and sufficient natural gas is available. Requesting this can be carried out in minutes and once gas firing starts, the maximum increase in generation usually takes 10-15 minutes to achieve. There may be some delay while revised offers are made and accepted in the electricity market.
35. NZS has 2 x 2.5 MW emergency diesel generating sets whose primary purpose is to provide power to essential loads on site in the event of a site-wide power outage (usually a grid failure). In an immediate or developing situation, consideration will be given to starting either one or both sets depending on conditions at the time.

36. In the past, NZS has trimmed the melters load to effect a load reduction but usually for not longer than 4 hours at a time. The trimming is usually of the order of 10-15 MW to take the melters' total load down to ~60 MW. It means that the Iron Plant (the upstream plant) can keep running at full capacity while the surplus RPCC is diverted into a storage hopper ready for subsequent processing. The storage hopper has about 4 hours capacity and when it is full, RPCC either has to be removed from the process flow or one of the kiln/multi-hearth streams has to be turned off with a resulting reduction in on-site generation.
37. Also in the past, NZS has turned off its Hot Strip Mill (HSM) to effect a load reduction of nominally 6 MW but normally for no longer than 6 hours at a time. Note that in section 30(d) the HSM average load is stated as being ~8 MW. When turned off, ~6 MW load reduction occurs as ~2 MW of auxiliaries keep on going. The HSM is not normally a bottleneck plant and when this is the case, it can turn off for load reduction purposes.
38. Also, in the Rolling Mills complex, NZS has two Cold Mills each rated at ~1.5 MW. Each mill has provision for material storage upstream. Relatively speaking, these loads are quite small and have never been used for load reduction purposes in the past.
39. The BOC ASU plant is fully integrated, that is the Oxygen, Nitrogen and Argon processes are all driven by the single main air compressor, thereby limiting the ability to discretely shed load. However, BOC is able to shed part loads from the facility to achieve partial load reduction as follows: H_2 Plant 1 MW and NZS Nitrogen Pipeline Compressors (2 x 0.39 MW). These loads may only be shed provided there is sufficient Nitrogen stock levels in storage and if the Hydrogen buffer storage vessels are at maximum pressure to maintain critical supplies to NZS.
40. A plant in the Finishing Plants complex is the Colour Coating Line. Relatively speaking, its load is very small, averaging ~1 MW. This plant is not available for load reduction purposes.

Comments on Other Plants at NZS

41. The Steel Plant has a load of ~3 MW on average. In relative terms, its load is small. There is basically no capability to store liquid iron produced by the melters upstream of the Steel Plant. If the Plant stops working, liquid iron has to be plated (tipped over a bank and allowed to cool) or the melters have to stop (along with the kilns and multi-hearth furnaces) with the ensuing modest net load fall. NZS does not plan to offer the Steel Plant into its load reduction plan.
42. The Ladle Metallurgy Furnace (LMF) and is a small arc furnace having three graphite electrodes connected to a transformer and is used for heating and stirring the liquid steel and for finalising its chemical properties prior to casting into billets. It has a 30-minute MD of ~14 MW and an average load of ~ 1.5 MW.
43. In the Finishing Plants, the largest load in this area is our Metal Coating Line. Its average load is ~8 MW and it is a continuous plant. NZS does not plan to offer the Metal Coating Line into its load reduction plan.
44. As mentioned earlier, BOC Gases Ltd operates an Air Separation Unit (ASU) at Glenbrook. The plant averages 8.5 MW and operates continuously. If the ASU is shut down completely, NZS and other BOC customers will be completely reliant on finite stored gases in liquid gas storage facilities. A complete

interruption to NZS supply (particularly Nitrogen) immediately causes emergency shutdowns of all NZS production plants. BOC is also the major supplier of pharmacopeia grade and aviation grade gases to the New Zealand market. NZS does not plan to offer a complete shutdown of the existing ASU into its load reduction plan.

Savings Plan

45. Following the receipt of a properly given supply shortage direction from the System Operator, NZS will issue a directive to all staff to reduce all discretionary electricity use. Discretionary means electricity use that does not impact on production and the health and safety of staff and the security of the site.
46. For any shortage, the first action the Company would take is to instruct Alinta to fire extra natural gas into Kilns Cogen and nominally an extra 9 MW can be generated, thereby reducing the Company's net load on the grid by the same amount. The amount actually generated depends on the Iron Plant's production conditions at the time. Firing extra natural gas has been used extensively in the past to reduce NZS's net load on the grid, both short and long term.
47. As mentioned earlier in section 35, the next action the company would consider is turning on either one or both 2.5 MW emergency generating sets depending on the conditions prevailing at the time.
48. The next load that NZS would consider turning off is the Hot Strip Mill (as explained in section 37) which will reduce the Company's load by nominally 6 MW.
49. Other loads which the Company would consider reducing should it be necessary to do so (not necessarily in order) are the Cold Mills, BOC Gases and the Melters (see earlier sections 38, 39 and 36 respectively for the loads involved).
50. Any MW savings figures depend on the production conditions of the various plants at the time the request to reduce load is given.
51. Should NZS be contacted by the System Operator to reduce load, NZS can provide up-to-date production status information on a confidential basis.
52. If NZS has already reduced load due to high spot prices when contacted by the System Operator, then this reduction shall form part of the response to the total reduction requested.
53. Rolling outages may occur at both GLN0331 and GLN0332.
54. A table summarising the Company's proposed load reductions is shown below. It should be noted that the first two mechanisms will not provide 25% savings between them, so the balance will be provided by either or both of the 3rd and 4th mechanisms. It should also be noted that the expected weekly % savings (cumulative) are based on the Company's net average demand of 53 MW.

Mechanism	Expected MW Demand (BAU)	Expected Weekly GWh demand, pre-savings (GWh)	Target Weekly GWh Savings	Expected Weekly % Savings (cumulative)
Firing extra natural gas in Kilns Cogen (9 MW)	0 MW	0 GWh	1.5 GWh	17%
Starting one emergency diesel generator (2.5 MW)	0 MW	0 GWh	0.4 GWh	22%
Either: Reduce operations of Hot Strip Mill	8 MW	1.3 GWh	0.5 GWh	> 25%
Or: Reduce operations of melters.	74 MW	12.4 GWh	2.4 GWh	> 25%

Disconnecting and Restoring Load

55. If a melter is turned completely on or off during a Rolling Outage period, the demand change will most probably exceed 25 MW over a 5-minute period. If the reason is for load reduction, the System Operator will be consulted before any planned change takes place. Please note that NZS performs regular business-as-usual melter inspections where each melter is turned off for normally 5-10 minutes and then turned on again, and these will most probably exceed 25 MW over a 5-minute period. These inspections are notified ahead of time as part of the Company's energy bids.
56. All other planned load changes will not exceed 25 MW in any 5-minute period.
57. NZS will use its best endeavours to minimise the impact of load changes on frequency and voltage stability and, if requested by the System Operator, will minimise the changes during times when load is typically ramping up or down in the region affected by the supply shortage (i.e., either side of morning or evening peaks).

Coordination with the System Operator

58. Communications from the System Operator for coordination of NZS operations will be made in the first instance to the Energy Balancing Duty Officer. If the Energy Balancing Duty Officer is unable to be contacted, then the Melter Supervisor should be rung. Contact details are contained in a separate letter sent by NZS to the System Operator.
59. As required under Section 6.13(a) of the SOROP, the receipt of a direction to save energy will be acknowledged. Such acknowledgements should be sent by email to the System Operator (system.operator@transpower.co.nz).
60. A documented procedure that provides instruction and guidance to the Energy Balancing Duty Officer and the Melter Supervisor for supply shortage events has been developed. This procedure includes how coordination with the System Operator is achieved during implementation of savings and restoration of loads.
61. In the event that a Grid Emergency is coincident with a request for savings under this PROP, it is assumed that the Grid Emergency requirements made by the System Operator will take precedence over the PROP savings plan. The level of savings available under this plan will, therefore, be reduced by the level of any load reductions made in response to a Grid Emergency. It is expected that this will be taken into account in the levels of savings required by the System Operator. NZS must take steps to ensure it meets the level of savings directed by the System Operator.
62. It should be noted that, in the event of a Grid Emergency (especially the Developing Event variety), NZS may already have taken some net load reduction actions before being contacted by the System Operator to do so under this Plan.

Monitoring and Reporting

63. For major loads, NZS internal SCADA data will be used to produce daily or weekly reports of savings achieved.
64. Increased generation output from the Kilns Co-generation plant will be recorded on existing data logging metering and daily or weekly reports will be produced.
65. For unmetered loads, savings will be calculated by comparison with an average energy consumption profile and the observed actual loading reductions for during a supply shortage event.
66. Monitoring and reporting is the responsibility of the Energy Manager.
67. If required, reporting to the Electricity Authority and the System Operator will be undertaken as requested.
68. Information will be provided weekly to the System Operator on the nature and extent of rolling outages and savings achieved compared to the target that was directed.