Pacific Steel Participant Rolling Outage Plan

Last Updated: October 2012
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Contents

Definitions

AUFLS	Automatic Under Frequency Load Shedding
Authority	The Electricity Authority
Code	The Electricity Industry Participation Code 2010
developing event	An event that evolves over time, e.g. as the result of a period of unseasonably low inflows to hydro catchments
EMP	The system operators Emergency Management Policy. Current version published 19th December 2011
GXP	Transpower Grid Exit Point at which the Pacific Steel load is connected
GEN	Grid Emergency Notice
immediate event	An event that occurs with little or no warning, e.g. as a result of a transmission or major power station failure
PROP	Participant Rolling Outage Plan (this plan)
PSG	Pacific Steel Group
Regulations	Electricity Governance (Security of Supply) Regulations 2008 and Electricity Governance (Security of Supply) Amendment Regulations 2009
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 sub part 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 on 18th December 2011
2. System Operator Rolling Outage Plan - Issued by the Electricity Commission on 30 September 2010
3. Pacific Steel Group 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
Pacific Steel	259 James Fletcher Drive, Otahuhu, Auckland.	MNG1101 (MNG0331 backup)
Pacific Wire	21 Beach Road, Otahuhu, Auckland.	MNG0331

7. The outage plan provides details of how Pacific Steel Group, (the Company) will respond to an event when it is declared by the system operator and how 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 PSG 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 shortage declaration is made PSG 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 PSG 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 PSG when a supply shortage declaration has been revoked

16. This PROP sets out the actions that PSG will take, who is responsible for implementing the actions and how communications will be managed between PSG and the system operator.

Background

The Electricity Authority

17. The Electricity Authority (Authority) is an independent Crown entity responsible for regulating the New Zealand electricity market. 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 to:
    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.

Pacific Steel

21. Pacific Steel Group (PSG) is the country's largest metal recycler based in Otahuhu, Auckland. A division of Fletcher Building, and New Zealand's only manufacturer of Wire Rod, Reinforcing Bar and Coil products.

22. The group comprises three businesses and a 50/50 joint venture with Sims Pacific Metals. Every year with joint venture partner, Sims Pacific Metals, they convert around 280,000 tonnes of scrap metal, including old car bodies are converted into steel products.

23. PSG plays a major role in producing reinforcing steel for the construction market. With 85 per cent market share in New Zealand, customers include steel merchants (43 per cent) and steel processors (57 per cent).

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 shortage 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 event 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 EMP describes two categories of events that could lead the system operator to make a supply shortage declaration these are:

- **Developing Event** – Events that evolve over time – for example as the result of a period of unseasonably low inflows to hydro catchments; and
- **Immediate Events** –. Events that occur with little or no warning – for example as a result of a transmission or major power station failure, the impact of which are expected to extend over a period of weeks rather than days.

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.

Full information & partial information PROPS

28. The System Operator Rolling Outage Plan sets out the following requirements for direct connect PROPs.

***Full information plans**: These plans must contain sufficient information for the system operator to make a decision on the most appropriate savings target for the direct-connect user.*

A direct-connect user's full information plan must inform the system operator about:

- the nature of the load on site;

- *whether any load is used to provide other services to the electricity sector such as interruptible load;*
- *the extent to which different levels of savings can be achieved;*
- *the nature of the measures that could be implemented; and*
- *the cost associated with different levels of savings.*

***Partial information plans**: These plans may contain some of the information required for full information plans. If the system operator sets a savings target for a region where there is a direct-connect user with a partial information plan, their savings target will likely be set to achieve the same percentage saving as distribution companies in that region.*

What this PROP contains

29. This PROP includes procedures for managing both developing and immediate category of event.

Section	Content
Communications	Contact details for communications during a supply shortage declaration
Description of Load	A description of the PSG load
Site response	How the site will respond to different types of event including a plan of possible savings
Coordination with the system operator	Sets out how PSG will coordinate with the system operator
Monitoring and reporting	How PSG will monitor and report savings made

30. This PROP contains all the information required for a Partial Information Plan but it is intended that it will be updated with cost of outages if a shortage declaration is made or is imminent.

Communications

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

Contact: Steel Plant Manager
Phone: 09-2761849
Mobile: 021-2702336

If unable to be contacted, then try:
Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

If unable to be contacted, then try:
Contact: Group Supply Chain Manager
Phone: 09-2761942
Mobile: 021-2739478 Contact:

If unable to be contacted, then try:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

The Steel Plant Manager will communicate with the system operator for operational communications using the following details:

Transpower Control Centre
Energy Desk Duty - 0800 535 123
Security Desk Duty - 0800 488 500
Hamilton Co-ordination Centre
Fax (07) 843 7176
Wellington Co-ordination Centre
Fax (04) 496 9109

Communications from the system operator about a supply shortage declaration should be made to:

Contact: Steel Plant Manager
Phone: 09-2761849
Mobile: 021-2702336

If unable to be contacted, then try:
Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

If unable to be contacted, then try:
Contact: Group Supply Chain Manager
Phone: 09-2761942

Mobile: 021-2739478

If unable to be contacted, then try:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

The PSG person responsible for reporting to the system operator on performance against savings targets is either:

Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

or:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

The person who the system operator should notify for revocation of the shortage declaration is:

Contact: Steel Plant Manager
Phone: 09-2761849
Mobile: 021-2702336

If unable to be contacted, then try:
Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

If unable to be contacted, then try:
Contact: Group Supply Chain Manager
Phone: 09-2761942
Mobile: 021-2739478

If unable to be contacted, then try:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

The above people will communicate with the system operator for administration and reporting against targets using the following details:

System Operator

Transpower

Level 7

Transpower House

96 The Terrace

PO Box 1021

Wellington

Telephone: 64 4 495 7000

Fax: 64 4 495 7100

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

Contact: General Manager
Phone: 09-2592791
Mobile: 021-716022

Description of site load

31. PSG, a division of Fletcher Steel Ltd, is New Zealand's only manufacturer of Wire Rod, Reinforcing Bar and Coil products and the largest metal recycler, converting around 280,000 tonnes of scrap metal per annum into quality steel products. The plants operate a 24/5 rotating Shift roster with the flexibility to change to 24/6 or 24/7 operation as required from the Otahuhu location. Across the twenty six (26) hectare site there is a range of HV equipment, including:

    - 1 X 33 kV Substation
    - 22 X 11 kV Substations
    - 55 X 11 kV Circuit Breakers
    - 46 X Transformers ranging from 0.3 to 45 MVA
    - 2 X Capacitor Banks
    - 12 X Battery Banks

32. There are eight power users on the PSG sites: Air Liquide, Sims Pacific Metals, Winstone Aggregates, Telecom, Special Metals, Fletcher Reinforcing, PSG Steel Site, and PSG Wire Site. PSG's main site receives power from the utility company at 110kV from where it is transformed via two utility owned transformers to 33 kV. In addition, the site has a 33kV, limited capacity backup supply.

33. Power is then distributed to two areas or applications; the Steel Plant furnace system and the PSG auxiliary system (11 kV). The Steel Plant furnace system draws a maximum demand of 48 MVA where the PSG auxiliary system only draws 23 MVA. PSG's lighting system is separate and receives power from the utility with a separate 11 kV supply (approximately 500 kVA demand).

34. The major electricity loads on site are:

    - Electric Arc Furnace – electrical energy is combined with chemical energy to heat the scrap to a molten state.

    - Gas Reheat Furnace - Once the appropriate billet grade is determined the billet must be reheated and is loaded into the gas reheat furnace which is continually loading. The reheat furnace has a capacity of over 150 tonnes of billet and typically takes two to three hours to heat up to the rolling temperature of 1060 degrees celsius.

    - Thirty six gas burners provide the heat and hot exhaust gas is reused to preheat the incoming combustion air, minimising any potential for heat loss.

    - Mechanical Descaling Equipment - This process took approximately 8 years to finally be able to enable the "acid pickling" process to be decommissioned.

    - "DECALUB" mechanical descaling unit - . This unit firstly through pulleys takes the rod on a 360 degree tight bend on both axis which removes another 30% of the surface scale and then the rod finally passes through two sets of wire brushes which remove the final 10% of scale. All the surface scale collected is recyclable or can be sold for various applications.

- Galvanising - This section consists of caustic baths, hot water rinse and steam cleaning. The wire enters the furnace through individual tubes and will not be exposed to Oxygen or moisture again until it is coated. This is achieved by burning low pressure Hydrogen through the tubes
  The temperature of the furnace determines the level of annealing.

35. The Arc Furnace load is offered into the FIR and SIR markets from time to time.

36. In summary;

Plant	**Maximum Demand**	**Ave. Monthly Consumption**
PSG Wire Site, & Special Metals	1.6 MVA	650,000.00 kWh
PSG Steel Site, & others	48 MVA	14,000,000.00 kWh
Pacific Steel Lighting	500 kVA	250,000.000 kWh

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How the site will respond to different types of event

Immediate & Developing Event

37. The system operator is responsible for making a supply shortage declaration and for directing specified participants to implement rolling outage. Communication of such a declaration and direction to PSG to reduce demand should be given to the following person.

Contact: Steel Plant Manager
Phone: 09-2761849
Mobile: 021-2702336

If unable to be contacted, then try:
Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

If unable to be contacted, then try:
Contact: Group Supply Chain Manager
Phone: 09-2761942
Mobile: 021-2739478

If unable to be contacted, then try:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

38. The above people have the authority to make demand reductions and are responsible for coordinating emergency demand response at PSG and communicating with the System Operator when a directive is in force.

39. PSG will maintain a contact register of external power users on site so that PSG can co-ordinate and communicate demand reductions. The contacts are as follows:

COMPANY: Winstone Aggregates

NAME: Tony Carpenter

TITLE: Quarry Manager

EMAIL: tonyca@winaggs.co.nz

MOBILE: 027-2808112

COMPANY: Air Liquide

TITLE: Plant Engineer

EMAIL: brian.lowe@airliquide.com

MOBILE: 027-5685594

COMPANY: Sims Pacific Metals
TITLE: Production Manager
EMAIL: neil.staveley@simsmm.com
MOBILE: 021-2416215

COMPANY: Fletcher Reinforcing
TITLE: Production Manager
EMAIL: carl.gould@freo.co.nz
MOBILE: 021-735915

COMPANY: Telecom
NAME: Maintenance Department
PHONE: 0800-103060 choose option 2 followed by option 1

COMPANY: Special Metals
TITLE: Plant Manager
MOBILE: 021-2444266

Savings Plan

40. Following receipt of a supply shortage direction properly given by the system operator PSG will, as soon as reasonably possible, 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 security of the site.

41. It is likely that that load will have been reduced in response to high wholesale electricity spot prices. If the required percentage savings has already been achieved through reductions in response to spot prices no further savings are to be made.

42. If the PSG has not already responded to spot prices and reductions are required to meet the system operator's direction then the following plan will be implemented.

43. It is considered that the following options will be available for consideration if a savings directive is received.

LOAD GROUP	Savings Option	Estimated potential reduction (MW)
1	Shutting Down MEP, Winstone Aggregates and Telecom (5 hour battery standby).	0.3
2	Stop Sims shredder motor (when operating).	2
3	Air Liquide Compressor motor	3
4	Stopping Rolling Mill Rod Block (coil) production for POP period.	3
5	Stop Electric Arc & Ladle Furnace.	32
6	Complete RM & SP shutdown (excl. various furnace cooling systems and ID fans).	45

Plant	Maximum Demand MVA	Ave. Monthly Consumption MWh	Average weekly consumption MWh
PSG Wire Site, & Special Metals	1.6	650	152
PSG Steel Site, & others	48	14,000	3,267
Pacific Steel Lighting	0.5	250	58
Total	**50.1**	**14,900**	**3,477**
Load factor	**41%**		

44. Indicative plans for various levels of savings, and their associated costs, are provided in the table below. It should be noted that only load groups 4,5 and 6 are presented in the indicative plan savings; support from the other three load groups is likely to be used in practice.

45. It is important to note that the indicative plans are based on assumptions made for a number of variable production levels and cost components.

46. Note that to achieve savings targets of between 10% and 20%, PSG intends to stop the Electric Arc & Ladle Furnace - which provides up to 2221 MWh per week in available savings. Therefore there is no specific plan set out for 15% savings. To estimate a cost for savings between 10% and 15% it is reasonable to interpolate between the two savings costs provided for 10% and 15%.

47. Although the cost figures have been left out of the table as these will change over time due to factors including the markets for PSG products. It is intended that accurate costs of outages will be submitted if a shortage declaration is made or is imminent.

5%, 10% and 15% Weekly MWh savings plan

Options	Expected demand (MW)	Expected pre savings weekly energy (MWh)	Targeted weekly savings (MWh)	Expected weekly savings (%)	Cost of savings $/MWh	Estimated option pre reduction loading (MW)	Estimated available weekly savings (MWh)	Shutdown period as % of full production
Stopping Rolling Mill Rod Block (coil) production for POP period.	50	3477	174	5.0%		3	208	84%
Stop Electric Arc & Ladle Furnace.			348	10.0%		32	2221	16%
Stop Electric Arc & Ladle Furnace.			695	20.0%		32	2221	31%
Complete RM & SP shutdown (excl. various furnace cooling systems and ID fans).			869	25.0%		45	3123	28%

Coordination with the system operator

48. Communications from the system operator for coordination of PSG's operations will be made in the first instance to the following:

Contact: Steel Plant Manager
Phone: 09-2761849
Mobile: 021-2702336

If unable to be contacted, then try:
Contact: HV Engineer
Phone: 09-2707922
Mobile: 027-511-9631

If unable to be contacted, then try:
Contact: Group Supply Chain Manager
Phone: 09-2761942
Mobile: 021-2739478

If unable to be contacted, then try:
Contact: Wiremill, Environment and Engineering Services Manager
Phone: 09-2761844
Mobile: 021-2702271

This communication will be made by telephone (see Communications section).

49. A documented procedure that provides instruction and guidance to the PSG operations controller for supply shortage events is being drafted. This procedure will include how coordination with the system operator is achieved during implementation of savings and restoration of the load.

50. The circuits supplying PSG are not armed for AUFLS.

51. 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.

Monitoring and reporting

52. For major loads, PSG's internally captured data will be used to produce daily or weekly reports of savings achieved.

53. 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.

54. Monitoring and reporting is the responsibility of:

    Contact: HV Engineer
    Phone: 09-2707922
    Mobile: 027-511-9631

55. Reporting to the system operator for operational monitoring purposes will be undertaken on a weekly basis or more frequently if requested.

56. Should it be required reporting to the Electricity Authority will be undertaken at intervals as required by the Authority.