

Electricity Commission

Analysis Paper

**Response to Rule Breach Investigation Report Recommendations
regarding Interruptible Load**

January 2008

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A. Introduction

Purpose

1. Following several under-frequency events in 2004 and 2005, the Electricity Governance Rules Committee (EGR Committee) of the Electricity Commission (Commission) appointed an investigator to investigate a number of alleged rule breaches relating to underperformance by interruptible load (IL) providers.
2. The investigator prepared a report titled 'Investigation and attempt to effect a settlement for the under-frequency event on 4 May 2004' dated 15 March 2005 (Investigator's Report). That report gave advice to the Commission on dealing with each individual breach allegation. The Commission does not publish investigation reports dealing with particular alleged breaches although settlement agreements and conclusions are published. However, the Investigator's Report also provided some suggestions or recommendations (policy recommendations) for improvements to arrangements dealing with interruptible load.
3. The purpose of this paper is to present the Commission's response to the investigator's policy recommendations, and to provide further background where that is relevant to consideration of the issues.
4. This paper is not a consultation paper. It does not contain any rule change proposals or follow the processes outlined in sections 172E and 172F of the Electricity Act 1992 that apply to rule change proposals. However, interested parties are welcome to provide feedback on the issues discussed in this paper. Feedback should be emailed with 'Interruptible load analysis paper' in the subject header to info@electricitycommission.govt.nz. Alternatively, feedback can be posted to the address below.

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5. Any feedback you provide on this paper may be made available to the general public on the Commission's website. Parties providing feedback should indicate any documents attached, in support of their comments, in a covering letter and clearly indicate any information that is provided to the Commission on a confidential basis. All information provided to the Commission is subject to the Official Information Act 1982.

Background

6. Before the commencement of the Electricity Governance Rules 2003 (Rules), IL performance was managed under bilateral contracts between Transpower and each IL provider. The commencement of the Rules on 1 March 2004 provided a new means of managing the performance of IL providers, namely the compliance regime provided by the Electricity Governance Regulations 2003 (Regulations).
7. On 4 May 2004, an under-frequency event occurred and the Commission was notified of alleged breaches by some ancillary service agents providing IL as instantaneous reserve (IR). The alleged breaches were of rules 6.3.3 of section II and 4.11 of section III of part G of the Rules. Rule 6.3.3 of section II of part G requires a reserve offer to be a reasonable estimate of the quantity of IR available. Rule 4.11 of section III of part G requires IL providers (as ancillary service agents) to comply with dispatch instructions. The alleged breaches were based on SCADA load indications taken before and after the under-frequency event.
8. The Commission began investigations into alleged breaches by four parties relating to the under-frequency event on 4 May 2004.
9. The EGR Committee also asked the investigator to carry out a fact finding exercise in relation to other alleged breaches relating to subsequent under-frequency events occurring on 23 June, 6 August, and 8 October 2004. Specifically, the investigator was asked to:
 - consider the similarities between the alleged breaches on these dates and the alleged breaches relating to the 4 May 2004 under-frequency event; and
 - make recommendations on the extent to which any settlements between the parties relating to the 4 May 2004 event could also resolve the subsequent alleged breaches.
10. The investigator concluded the investigation with a report to the Commission's EGR Committee dated 15 March 2005.
11. In many cases, providers admitted the breaches and agreed to change their trading, operating, and/or training practices to ensure similar breaches did not happen again. The Investigator's Report recommended that the EGR Committee decline to pursue the alleged breaches. The Committee agreed and recommended that the Board approve the settlement agreements. It did not recommend that the Board lay any formal complaints with the Rulings Panel.
12. In addition to the recommendations on each of the breach allegations he investigated, the investigator also made a number of policy recommendations and observations relating to IL arrangements. The report noted the view of

the system operator and other parties that there was a developing maturity and continuing progress in the offering of reserve by IL providers.

13. At its meeting on 24 March 2005, the EGR Committee invited the Senior Adviser Wholesale to consider the investigator's policy recommendations. This paper outlines the Commission's consideration of those policy recommendations and includes input from subsequent similar breach allegations and advice from the Wholesale Market Advisory Group (WMAG).

Abbreviations used in this paper

Act	Electricity Act 1992
AUFLS	Automatic under-frequency load shedding
Board	Electricity Commission Board
Commission	Electricity Commission
EGR Committee	Electricity Governance Rules Committee
FIR	Fast instantaneous reserve
IL	Interruptible load used as instantaneous reserve
IR	Instantaneous reserve
GXP	Grid Exit Point
MW	Megawatt
Regulations	Electricity Governance Regulations 2003
Rules	Electricity Governance Rules 2003
SCADA	Supervisory control and data acquisition – a system used by Transpower to measure the electricity system.
SIR	Sustained instantaneous reserve
SPD	The Scheduling Pricing and Dispatch model that is used to determine spot market prices
WMAG	Wholesale Market Advisory Group

B. Analysis

Introduction

14. IR is procured by the system operator to respond to under-frequency events. IR is either an increase in generation or a reduction in load to bring load and generation back into balance after the unexpected loss of generation or the HVDC link and thus return system frequency to the normal operating range. If insufficient IR is available during an under-frequency event then the system operator has to rely on automatic under-frequency load shedding (AUFLS) to restore system frequency and avoid a system collapse.
15. Reserve offers are a key input in the Scheduling Pricing and Dispatch model (SPD) that is used to determine spot market prices. IR can be offered as fast instantaneous reserve (FIR) and/or sustained instantaneous reserve (SIR). SPD co-optimises energy offers and reserve offers to produce energy and reserve dispatch quantities and final prices. The cost of IR is paid by generators (with units greater than 60MW) and the HVDC owner¹.
16. IL is an important source of IR, comprising as much as a third of IR offers. Consequently, the cost and quality of IL provision impacts both on the stability of the electricity system following an under frequency event and on prices.
17. Arrangements for the procurement of IL influence the extent to which the Commission achieves its principal objectives and specific outcomes (section 172N of the Electricity Act 1992 (Act)). The specific outcomes include that:
 - a. risks (including price risks) relating to security of supply are properly and efficiently managed (section 172N(2)(b) of the Act); and
 - b. delivered electricity costs and prices are subject to sustained downward pressure (section 172N(2)(f) of the Act).

IL breaches and the Investigator's Report

18. There have been a number of breach allegations made over the past three years relating to reserve provision. Table 1 shows the number of breach allegations made from 2004 through to 2006 that relate to:
 - i. the obligation to comply with dispatch instructions for IL, and

¹ Rule 11.5 of section IV of part C.

- ii. the requirement that reserve offers be a reasonable estimate of the quantity of reserve available.²

Table 1: Number of alleged breaches relating to IL delivery

Calendar year	Breach allegations relating to IL dispatch	Failure to provide a reasonable estimate in IL reserve offers
2004	13	9
2005	20	2
2006	2	1
2007 ³	6	4

Note: The precise numbers can vary depending on the methodology adopted for counting alleged breaches. In particular, when a single IL provider is the subject of a number of alleged breaches (e.g. underperformance of IL at a number of different GXPs, or where multiple under-frequency events occur in the same month), these breaches are dealt with in a single file. The above count reflects the number of files rather than the number of individual alleged breaches.

- 19. Table 1 indicates there was a substantial fall in the number of breach allegations in 2006.
- 20. The Investigator's Report investigated the cases that occurred in 2004 and recommended:
 - a. reviewing the wording of rule 4.11.2 of section III of part G (which provides an exception to the dispatch compliance obligation when plant is responding to an automatic signal to provide reserve) to provide improved clarity of the intent of the rule;
 - b. consideration be given to requiring IL providers to carry out specific tests (to ensure equipment works and to confirm reserve offer quantities) and to provide specific training for IL operators;
 - c. reviewing the way in which quantitative assessments are made of IL performance following an under-frequency event, the strict tolerance applied to the evaluation of dispatch compliance, and the meaning of the term "reasonable estimate" which occurs in the obligation relating to reserve offers;
 - d. reviewing the payment methodology for FIR and SIR to ensure the financial incentives do not cause IL providers to systematically over-estimate availability of reserves;

² Most of the alleged breaches relating to the "reasonable estimate" requirement for reserve offers are based on observations of the amount of reserve actually provided in an under-frequency event. Consequently, most of those alleged breaches are also accompanied by an alleged breach of an IL dispatch instruction by the same IL provider relating to the same under-frequency event.

³ To 18 December 2007.

- e. reviewing the interface and potential overlap between the role of the Rules and the role of ancillary service procurement contracts (procurement contracts) in managing performance by IL providers.
21. The report also noted that some IL resources consist of a large number of distributed under-frequency relays that will contain some variation in the frequency at which they trip load, so that load may not all be dropped at exactly 49.2 Hz. In addition, the report noted that the IL provider should discuss any stepped provision of IL (where tranches of load trip off at different frequencies) with the system operator.
 22. The Commission has also noted that the Rules require the initial reserve offer (submitted by 1pm on the day before the relevant trading day) to be a “reasonable estimate” of availability, but do not specifically require subsequent revisions to that reserve offer to meet a “reasonable estimate” test.
 23. Each of these issues is discussed separately below.

Clarity of rule 4.11.2 of section III of part G

Issue

24. Rule 4.11.2 provides an exception to the obligation to comply with a dispatch instruction where:

4.11.2 Responding to automated capacity reserve signal

The plant is responding to an automated signal to activate **capacity reserve, instantaneous reserve or over frequency reserves**

25. One participant who was the subject of an alleged breach of an IL dispatch instruction under rule 4.11 of section III suggested that rule 4.11.2 could apply as an exception where the IL was provided as an automatic response to a fall in frequency.
26. The investigator investigated the intent of the rule, and concluded that the rule was intended to provide that an ancillary service agent who is *already* providing reserve in response to an event (e.g. an under-frequency event) is not required to stand ready to provide *further* reserve for the period of time in which it is responding to the first event.
27. However, the investigator considered that the rule could be made clearer to avoid any doubt of its intent.

Commission comment

28. The Commission’s expectation is that rule 4.11.2 relates only to situations where reserve is *already* being provided. If an ancillary service agent is

already responding to an automated signal to provide one of those types of reserve (that is, if an event has occurred that triggers the automatic response), then the ancillary service agent is not expected to continue to stand ready to comply with any further dispatch instructions given during that time.

29. The Commission's market governance team is not aware of any additional cases, since the single case in 2004 referred to in the Investigator's Report, where a participant has relied on this interpretation of the Rules to justify an alleged non-compliance with a dispatch instruction. Consequently, there appears to be no strong reason to clarify the matter by a rule change.

Estimates of availability, equipment testing and training

Issue

30. One of the alleged breaches investigated was apparently caused by a software programming problem which in turn caused the IL provider's equipment to respond ineffectively. Part of the investigator's brief involved estimating the financial impact of any breach on market participants to help determine whether financial settlements would be appropriate in any settlement agreement. The Investigator's Report noted the difficulty in estimating the cost to the market of the overpayments made to the IL provider, due in part to the lack of clear information about the nature of the software problem and the range of circumstances in which the problem would have become manifest.
31. The Investigator's Report concluded:

“Detailed and specific information is needed to evaluate the effects of failure to provide IL due to plant failure. The recording and provision of such information should be a requirement on providers.

It is considered that a valuable addition to the obligations of reserve providers would be a requirement to hold a specific level of equipment testing and the maintenance records of equipment tests. Given the diversity of equipment and systems it is probable that this requirement would be best included in the procurement plans and contracts.”
32. Another breach involved an IL provider restoring load before being instructed by the system operator (as required by the definition of sustained instantaneous reserves in part A of the Rules). Reflecting on this acknowledged breach, the Investigator's Report provided some comments on IL operator procedures and training:

“The nature of IL used for under-frequency reserves requires sound processes to be adopted by providers. This applies particularly to loads that, when interrupted automatically by an under-frequency event, can be switched back in by an operator. The training of operators and clearly documented procedures are essential requirements of reserves provision.

It could be considered that those requirements are not clearly stated in the EGRs, procurement plan or the reserve provider contracts. A requirement for an annual audit and certification process may place focus and emphasis on this important aspect of reserve provision. As the types of reserve can be very different (i.e. industrial loads and ripple control systems) it is probable such requirements are best contained within the reserve provider contracts and that self audit and certification are the preferred approach with external audits reserved for cases where concerns are not addressed. The system operator has provided comment that it would prefer the requirements to be included in the EGRs or the procurement plan.”

33. A number of breaches investigated related to IL providers making overly ambitious estimates in their reserve offers of the quantity of FIR and/or SIR available from the IL resource. The Investigator’s Report quotes a comment from the system operator saying that IL providers should have appropriate testing regimes in place, and should base their offers on the results of those tests. The investigator found that some of the breaches were “contributed to by the lack of testing and development of IL profiles”. In a number of cases, IL providers admitted breaches and undertook (through settlement agreements) to improve the profiling of their IL (e.g. by conducting drop-load tests).
34. Another breach appeared to have been caused by a combination of inappropriate settings on relays and timers (an apparent mistake by the IL provider or contractor) and by overly ambitious estimates of availability. The Investigator’s Report concluded:

“It is considered that it would be appropriate for the system operator and [the IL provider] to agree in writing a development programme for the estimation of IL that will provide comfort to the system operator that [the IL provider] is continuing its endeavours to provide reasonable estimates.”

Summary of policy recommendations

35. The Investigator’s suggestions can be summarised as follows:
 - a. Amend the procurement plan (and possibly invite the system operator to seek corresponding amendments to existing IL ancillary service procurement contracts) to require IL providers to **make and retain records of their equipment testing and maintenance**, and to require IL providers to give this information and other information to an investigator on request. This would enable the investigator to draw conclusions about the extent to which offered and/or dispatched quantities of IL were in fact not available in the hours, days and weeks leading up to the observed under-performance;
 - b. Amend the procurement plan (and possibly invite the system operator to seek corresponding amendments to existing IL ancillary service procurement contracts) to require parties to put in place certain **training and procedures to ensure IL equipment functions as intended**, and to require an annual audit and certification (a self audit

unless concerns are not addressed) that appropriate training and procedures are in place; and

- c. It may be appropriate for the system operator and an IL provider to agree in writing to a **programme for developing an IL profile** (e.g. a series of drop load tests) which can then be used as the basis for offering the IL into the market. The Investigator's Report appeared to be saying that this agreement could be contained in settlement agreements following an alleged breach, although the investigator may have had in mind an amendment to the procurement plan leading to changes to the IL ancillary service procurement contracts.

Commission comment – framework for testing, procedures and maintenance

36. The procurement plan provides that:
 - the system operator may request an **on-demand test** of the equipment used to provide IL or monitor IL performance (see rules 67 to 69 and 137 to 138 of schedule C5 of part C).⁴ The system operator pays for on-demand tests unless the equipment fails the test (in which case the IL provider pays);
 - an IL provider must ensure that the relevant **equipment is maintained in accordance with good industry practice** (see rules 124.1.1 and 135 of schedule C5 of part C); and
 - the system operator may **inspect any equipment** used to provide IL in a way that does not unreasonably interfere with the IL provider's business (see rules 70 to 71 of schedule C5 of part C).
37. Although the Rules provide for on-demand tests and inspections, and require maintenance in accordance with good industry practice, these provisions are not intended to remove responsibility from the IL provider. An IL provider who carries out on-demand tests, submits to inspections and can demonstrate good maintenance practices is not absolved from potential liability for under-performance caused by an equipment fault. The IL provider has a continuing obligation to ensure that the offered/dispatched quantity is available. In this respect, the Rules specify the outcome (the IL provider must provide the offered/dispatched quantity) rather than relying on controlling the inputs necessary to achieve that outcome (the testing, inspections, procedures and maintenance requirements for each individual IL provider), although some ability to manage the inputs is retained.
38. This is an appropriate framework given the range and diversity of different IL resources. IL providers have an incentive to undertake reasonable levels of maintenance and testing. The Regulations protect IL providers from liability in the event of a force majeure, and limit the extent of their liability from any

⁴ There are no "baseline tests" required for equipment used to provide or monitor IL – see rule 136 of schedule C5 of part C of the Rules.

other single event (limited to the lesser of \$100,000 or 5 percent of expected annual fees) or from events in a 12-month period (limited to the lesser of \$300,000 or 20 percent of expected annual fees).⁵ This means that IL providers do not have an incentive to take unreasonably high levels of precaution.

39. The Rules rely primarily on the incentive that IL providers have to maintain and test equipment and implement effective procedures (e.g. staff training) in order to avoid under-performance that breaches the Rules.

Commission comment – records of testing and maintenance

40. Section 172KB of the Act requires participants to co-operate fully with any investigation, including by providing relevant records and by permitting employees to be interviewed.
41. Records of testing or maintenance work could be useful to an investigator to assist in determining certain financial implications arising from observed under-performance by an IL provider in an under-frequency event. An investigator may like to be able to determine the extent to which the observed under-performance at a particular point in time suggests that previously offered/dispatched quantities (in previous minutes, hours, days or weeks) were also not capable of being delivered.
42. The Commission believes that there is a need for proper record keeping. The Rules do not currently require IL providers to make records of any testing and maintenance work carried out on equipment, or to keep those records for any given length of time. However, the Commission believes that there is a need for proper record keeping and would expect that IL providers would normally make and retain such records for their own business purposes. The Commission expects that records would be made available to it under section 172KB of the Act.
43. The Commission also expects participants to monitor their own performance and where necessary self-report situations where the Rules have been breached.⁶

Commission comment – training and procedures

44. As described above, the requirement to deliver the offered/dispatched quantity of IL is the primary means of providing an incentive for IL providers to implement appropriate training and procedures. The emphasis is on specifying the outcome (delivering dispatched quantities of IL) rather than on controlling the inputs (training and procedures).

⁵ See regulations 53A to 53C for the force majeure provisions and regulation 115A for the limitation of liability provisions.

⁶ Regulation 63 requires participants to self-report breaches of any rules relating to quality and security in part C or part G of the Rules.

45. If an IL provider under-delivers IL and a breach is alleged, a settlement agreement can often be reached. The system operator (or other affected parties) may seek undertakings in that settlement agreement regarding training and procedures. Parties who repeatedly under-provide IL are likely to attract increasing scrutiny from the Commission with control of the IL provider's IL "inputs" (e.g. staff training). Repeated breaches are likely to be referred to the Rulings Panel who have the power to make orders, including imposing financial penalties or requiring compensation to be paid.
46. If the system operator would like the procurement plan to specify training and procedures (or to require training and procedures to be specified in the IL ancillary service procurement contracts), that issue can be considered as part of the annual review of the procurement plan. The system operator has not requested such a provision to date.

Commission comment – agreeing a programme to develop an IL profile

47. Again, the emphasis of the Rules on specifying IL outputs rather than inputs should be noted. As for the training and procedures issue discussed above, repeated under-performance is likely to attract more interest (through the settlement agreement process) in specifying the details of an appropriate programme to develop an IL profile. It is unlikely that an IL provider who maintains a good record of delivering dispatched quantities would be required to provide details of such a programme.

Quantitative assessments, dispatch tolerance and “reasonable estimate”

Issue

48. When an under-frequency event occurs, the system operator calculates the quantity of reserve provided by each IL provider using a methodology described in appendix A of the procurement plan (schedule C5 of part C of the Rules).
49. If an IL provider has provided less reserve than the dispatched quantity the provider should be notified in accordance with the relevant ancillary service procurement contract. Any party may then notify the Commission of an alleged breach of rule 4.11 of section III of part G (compliance with dispatch instructions). The system operator has noted that its practice is to notify an alleged breach in relation to any under-performance by an IL provider against a dispatch instruction. There is no tolerance band applied below the dispatched quantity (apart from a very small margin for meter accuracy).
50. In some cases, under-performance against the dispatch instruction may also suggest that the IL provider's reserve offer was not a “reasonable estimate” of the quantity of reserve available, and therefore a breach of rule 6.3.3 of section II of part G.

51. IL providers have disputed a number of breach allegations. These have often centred on one or more of the following inter-related issues:
- a. the method for calculating the quantity of reserve delivered following an under frequency event;
 - b. the lack of flexibility (i.e. tolerance of relatively small under-performance quantities) when evaluating compliance or non-compliance with dispatch instructions, particularly given the inherent uncertainty of some IL resources (e.g. domestic hot water);
 - c. the meaning of “reasonable estimate” in rule 6.3.3 of section II (reserve offers must be a “reasonable estimate” of the quantity of reserve available).
52. Some IL providers are concerned that a very strict compliance regime (requiring IL providers to be highly confident of delivering the offered quantities) would allow only very small quantities to be offered from each such IL resource, and consequently would under-value the resource. This could cause IL providers to consider withdrawing some IL from the market in a way that is detrimental from a national perspective.
53. Some parties also expressed a concern that a conservative approach to offering reserves could lead to substantial over-provision in an under-frequency event so that an over-frequency situation could occur.

Commission comment

54. The Commission is aware that some IL resources are difficult to estimate. All providers are expected to implement appropriate mechanisms (for example, a drop load testing programme) to ensure their reserve offers are reasonably accurate estimates of the IR they have available. The accuracy of estimated quantities of IR is important because the system operator relies on those quantities to ensure that the system is achieving the intended level of security.
55. The Commission notes that current arrangements for IL procurement are not perfect. One criticism is that the current arrangements effectively provide lower payments to IL resources that have greater uncertainty attached to them (depending on the level of conservatism the IL provider chooses to incorporate in the reserve offer). This may not accurately reflect the way that multiple statistically independent IL resources combine to deliver greater certainty for the total quantity of IL provided.
56. There are a number of possible approaches that could be considered in order to improve the efficiency of IL procurement. One possibility would be to focus on the method for measuring the quantity of reserve actually provided by each IL provider.⁷ If there are circumstances in which the method under-represents

⁷ The methodology is contained in appendix A of the procurement plan (schedule C5 of part C of the Rules).

the true quantity of reserve provided, an appropriate change to the method could enable higher offer quantities to be assigned to some IL resources. The annual review of the procurement plan provides an opportunity for IL providers to raise these issues with the Commission and the system operator.

57. An alternative approach could be to provide additional “flexibility” in the drafting of the dispatch obligation or in the way in which compliance with that obligation is managed. There are a wide variety of possibilities that could fit within this approach. One possibility might be to introduce a probability-based means of evaluating dispatch compliance, so that under-performance by an IL provider in one particular under-frequency event may not necessarily be pursued as a breach of the dispatch compliance provision by the EGR Committee.⁸ The costs and benefits of such an approach would depend on the details of the arrangement. In particular, consideration would need to be given to the way in which such an arrangement would affect the system operator’s modelling of reserve requirements, and the effect on the overall quantity of reserves procured.
58. Efficiency imperfections in the current arrangements arise because IL resources have diverse characteristics, yet they are traded in the market (and modelled in the reserve management tool) as only two commodities: FIR and SIR. In addition, an IL provider’s reserve offers contain simple quantities in MW rather than containing more complex information about the expected distribution (e.g. mean and variance) of the reserve provided by that IL provider. The consequence of this imperfect modelling is that some IL resources (particularly those that have advantages that are not recognised by the modelling) will be under-valued by the market relative to other IL resources.
59. This analysis suggests that the collection of more complex information through reserve offers, and more complex modelling (in SPD and RMT) of reserve “commodities”, could improve the efficiency of reserve procurement. The Commission is considering alternative IR arrangements as part of its work on common quality development issues.⁹ However, the Commission is conscious that the estimated benefits of any alternative arrangements would need to outweigh the estimated costs of their design and introduction, and will need to be prioritised against other Commission activities.
60. A number of IL providers have raised questions over the interpretation of the requirement for IL offered quantities to be a “reasonable estimate” of the amount of reserve available. The system operator has published a *System Operator Commentary on “Reasonable Estimate”* (February 2007)¹⁰ to

⁸ For example, the IL provider may be able to show that the under-performance was relatively small and caused by an unexpectedly low level of availability which is expected to occur only very infrequently.

⁹ See the frequency development section of the Commission’s Common Quality Development Plan, available on the Commission’s website at <http://www.electricitycommission.govt.nz/opdev/comqual/strategicdevelopment>.

¹⁰ To view the document, see the system operator website at <http://www.transpower.co.nz/?id=5929>. From the “Documentation” menu, choose “Reports / Papers”. Navigate down to the list of papers.

provide some guidance on the system operator's practice in this area. The Commission notes that, in many cases of alleged under-performance by an IL provider, the notification relates to the dispatch obligation in rule 4.11 of section III of part G (in which the phrase "reasonable estimate" does not appear). In some cases a breach of the offer requirement (offered quantities must be a "reasonable estimate" of available reserve) in rule 6.3.3 of section II of part G of the Rules is also alleged in relation to the same set of circumstances. In practice the dispatch obligation is usually the "tighter" obligation on an IL provider because *any* under-performance (not just *unreasonable* under-performance) may be regarded as a breach. If an IL provider has under-performed, any settlement agreement between the relevant parties may not be affected substantially by the legal question of whether rule 6.3.3 has also been breached. Consequently, changes to the "reasonable estimate" provision in rule 6.3.3 are not likely to have a substantial impact on IL providers or on the quantity of IL offered unless arrangements for compliance with the dispatch provision are also affected.

61. Finally, the system operator has noted that conservative offers of reserve are unlikely to cause an over-frequency situation. The Commission will continue to monitor the risk that over-provision of IL may result in an over-frequency event, but at this stage the Commission considers that the risks are low and capable of being managed effectively.

A review of the method of payment for instantaneous reserve

Issue

62. The Investigator's report noted that the payment methodology for FIR and SIR may create an incentive for IL providers to over-estimate the quantity of reserves they have available. IL providers receive availability payments based on dispatched quantities. There is no automatic, rule-based mechanism for penalties or incentive payments for under- or over-performance, except that failure to comply with the Rules can result in financial penalties or compensation being imposed by the Rulings Panel.
63. The incentive to over-estimate availability may arise where an IL provider may want to increase the dispatched quantity (perhaps to achieve a higher revenue) and may not be concerned about negative outcomes arising from more frequent failure to comply with the Rules, nor about the consequences of insufficient reserves being available in the event of an under-frequency event.

Commission comment

64. Breaches by IL providers of the dispatch compliance and "reasonable estimate" provisions have not historically resulted in financial penalties being imposed by the Rulings Panel. However, the costs to an IL provider of dealing with a breach allegation are not inconsequential, and many participants have

noted that the effect of a breach on a participant's reputation is a significant deterrent. Consequently, there is likely to be a substantial incentive in practice to provide accurate estimates of availability.

65. Note that, if a particular IL provider continually breaches the Rules, the Commission is more likely to lay formal complaints with the Rulings Panel in relation to that participant's behaviour. Any interested participant is also able to lay a formal complaint with the Rulings Panel if, following a breach investigation, the Commission chooses not to lay a complaint with the Rulings Panel.
66. Frequent IL under-performance may also attract more interest in requiring the IL provider (through settlement agreements) to carry out specific operational measures such as equipment testing, maintenance, training, or a programme to establish an IL profile to be used for determining offered quantities. In extreme situations, the system operator has the right to terminate an ancillary service schedule to an ancillary service procurement contract (see rule 55 of schedule C5 of part C).
67. The Commission considers the present compliance regime (including the possibility of the Rulings Panel imposing financial penalties or compensation) and framework for IL procurement is appropriate. The Commission notes that the lower number of breaches alleged in 2006 (see Table 1 above) may have been brought about by improvements to IL providers' systems and approach to determining offered quantities. The Commission will continue to monitor performance in this area.

Interface between procurement contracts and the Rules

Issue

68. An IL provider can offer IL only by first entering into a bilateral ancillary service procurement contract with the system operator. The Investigator's report suggested that the interface and potential overlap between the Rules and procurement contract provisions may need review. As an example, the Investigator's report noted that recovery of compensation or over-payments following an IL provider's under-performance can occur through the compliance regime associated with the Rules, or through the procurement contracts.¹¹

Commission comment

69. The Commission considers that any overlap between the Rules and procurement contracts is not problematic. The procurement plan (schedule

¹¹ Typically only a small amount is recovered, because it will be calculated as a portion of the reserve payments made to the relevant IL provider in relation to the single trading period in which the under-frequency event occurred.

C5 of part C of the Rules) provides a framework for establishing ancillary service procurement contracts, including key terms and provision for any overlaps. For example, paragraph 58 of the procurement plan (under the heading “limitation of liability”) provides that, where a party breaches a Rule and also breaches a provision of the procurement contract, the liability of that party (if any) will be determined under the Regulations and Rules and there will be no liability under the procurement contract.

70. If particular participant concerns arise, they can be addressed as part of the annual review of the procurement plan.

Variations in the frequency at which relays trip load

Issue

71. Relays used to trip IL have an inherent degree of frequency measurement inaccuracy and operate only if frequency stays below their trip level for longer than a specified period (usually a few hundred milliseconds). Even if all relays are set to trip at 49.2 Hz (as required) the variance in relay tolerances causes some relays to trip earlier than others.
72. Under certain conditions, load that trips earlier can cause frequency to ‘bounce’ back before the rest of the interruptible load relays trip their load. If an IL resource is controlled by a single relay, it will be clear whether or not the load was tripped. However, if an IL resource is tripped by a large number of relays (for example, where the hot water load on a distribution network is offered as IL, and where each cylinder has its own relay), it could be difficult to determine with confidence whether more load would have tripped off if frequency had fallen a little further. It might not be appropriate to treat under-performance in this case as a breach of the Rules.

Commission comment

73. If frequency falls only marginally and briefly below 49.2 Hz before returning above that level, the Commission may not envisage pursuing a breach allegation against an IL provider who has under-provided IL in circumstances where some or all of the IL resource has not or may not have tripped due to the reasonable tolerance of the relevant relays.

Stepped IL response

Issue

74. A feature of some IL is that it can operate in steps in response to under-frequency events. Some IL resource could be set to trip at a higher frequency than other IL resources. Alternatively, in the case of IL offered as SIR, a

portion of the resource could be set to trip relatively quickly while the rest of the resource could be tripped off after some delay (e.g. 30 seconds). The Investigator's Report suggested that this feature could allow under-frequency events to be managed more appropriately and efficiently, because less IL would trip off in response to smaller or less sustained frequency deviations.

75. The Investigator's Report suggested that, if IL is to be provided in a stepped fashion, there must be a clear understanding between the system operator and reserve providers regarding how this feature will be used. Otherwise, there is a risk that the feature may be operational without the system operator's knowledge and could contribute to a number of potential rule breach allegations.

Commission comment

76. The Commission notes that the system operator's practice is to have IL providers set the trip frequency for their IL at 49.2 Hertz. At present the IL provider must continue to offer reserve quantities in a way that matches the definition of FIR and/or SIR, as appropriate, and the Commission will continue to monitor the delivered quantity in accordance with those definitions and in accordance with the procurement plan.
77. Ideally IL providers could offer stepped IL response which would be modelled by the system operator and priced appropriately. This would require significant changes to be made to market systems (which would become more complex). It is not clear at this stage whether that work would deliver net benefits. However the Commission will keep this in mind for any future review of IR.

Requirement for reserve offer to remain a reasonable estimate

Issue

78. The Commission has noted that the requirement for reserve offers to be a reasonable estimate (rule 6.3.3 of section II of part G) appears to apply only to the initial reserve offers submitted by 1300 hours on the day before the relevant trading day.
79. A rule change has been proposed to require an IL provider to revise reserve offers so that the latest reserve offer always represents a reasonable estimate of availability. This would appear to be more consistent with the equivalent arrangements for energy offers. Rule 3.15 of section II of part G requires that generators must revise their energy offers immediately whenever a generation plant's capability to meet offered or scheduled quantities changes by a determined amount.

Commission comment

80. The Commission expects to propose a rule change to this effect in due course. Further comment will be provided as part of the consultation on that proposed rule change.
81. At present, the Commission observes that IL providers generally do revise their reserve offer quantities when they no longer reflect a reasonable estimate of available reserves. The Commission expects that IL providers will continue this practice even if the Rules do not (at present) specifically require it.