Security and Reliability Council

12 November 2013 AUFLS event review

The Authority's report on the event and the system operator's feedback

10 March 2015

Note: This paper has been prepared for the purpose of SRC discussion. Content should not be interpreted as representing the views or policy of the Electricity Authority.

Contents

1 Introduction

1.1 The purpose of this paper is to obtain advice from the Security and Reliability Council

1.1.1 The Security and Reliability Council's (SRC) functions under the Electricity Industry Act 2010 include providing advice to the Electricity Authority (Authority) on reliability of supply. The SRC has determined that part of its role with respect to reliability is to be selectively involved in post-event reviews so as to ensure lessons are learned from events (or near-misses), particularly where those lessons involve cross-industry coordination.

1.1.2 The purpose of this paper is to present the Authority's report on the 12 November 2013 AUFLS event to the SRC in order to receive any advice on the subject.

1.2 This paper includes the Authority's report and the system operator's response

1.2.1 The structure of this paper is as follows:

a) this brief cover paper

b) the Authority's report on the 12 November 2013 AUFLS event (appendix A)

c) the system operator's response to the Authority's event report (appendix B).

1.2.2 The Authority's report on the 12 November 2013 AUFLS event includes background about the event and the Authority's approach to performing enquiries into market matters.

1.2.3 The Authority's report on the 12 November 2013 AUFLS event is ready for publication, subject only to consideration of the SRC's advice.

1.2.4 Authority staff, acting as the SRC secretariat, offered the system operator the opportunity to document its response, briefly outlining its key points of disagreement. The system operator has done so.

Q1.	Does the SRC agree that the Authority's report on the 12 November 2013 AUFLS event has accurately established the key facts relating to the event?
Q2.	Does the SRC agree with the conclusions that the Authority drew from the facts relating to the event?
Q3.	What advice, if any, does the SRC wish to provide to the Authority?

Appendix A The Authority's report on the 12 November 2013 AUFLS event

[Post-script note: The SRC received the *draft* version of the Authority's enquiry on the 12 November 2013 AUFLS event. Rather than have drafts in public circulation, this enquiry has been omitted from this published version of the SRC paper. When published, the final version of the enquiry is available from http://www.ea.govt.nz/monitoring/enquiries-reviews-and-investigations/2015/]

Appendix B The system operator's response to the Authority's report

John Clarke
Tel: (04) 590 7074
Mob: 021 329 293

Transpower House
96 The Terrace
PO Box 1021
Wellington, 6140
New Zealand
Telephone +64-4-495 7000
Facsimile: +64-4-495 7100
www.transpower.co.nz

10 March 2015

To: Security and Reliability Council

System Operator's comments on the Electricity Authority's report on the 12th November 2013 AUFLS event.

1. Background

To commission Pole 3 and upgraded Pole 2 the HVDC project completed approximately 400 live tests in the market during 2013. On 12th November 2013 the HVDC Bipole unexpectedly and rapidly reduced transfer during high power testing. The HVDC transfer reduced from 1018 MW to 140MW, causing system frequency to fall quickly. As a result some North Island AUFLS feeders tripped, shedding 12% of North Island demand.

The high power test in question was considered a low risk by the system operator and followed earlier successful and similar tests at low and medium transfer levels. This meant the high power tests were assigned a secondary contingent event status (with the effect that risk of trip was not covered by purchased reserves but by reliance on operation of AUFLS feeders). In any event, at the required high transfer levels there were and are insufficient reserves available to cover the risk.

Event causation was established as an incorrect implementation of control logic in the Benmore filter protection system for the HVDC, resulting in the protection operating incorrectly during the 12th November test and the consequent bi-pole run-back. A previously discovered issue with HVDC Benmore filter protection settings found in September 2013 (which if fixed then would have prevented the runback and resultant AUFLS event) was awaiting implementation at the time of the AUFLS event. It had been incorrectly determined the issue (discovered in September) would not result in an event such as occurred on November 12th.

Transpower, as both grid owner and system operator, assisted Authority staff to prepare its report (now being considered by the SRC) by providing relevant information and commenting on report drafts.

2. Report conclusions

The Authority review supports the approach taken by the system operator in managing Pole 3 and Pole 2 testing risks and its operational management of the testing. This management included an overall risk management framework, agreed with the grid owner, which provided for a staged approach to testing (and an agreed method of moving from one stage to another) and a procedure whereby each test was reviewed by the parties and a risk status agreed.

However, the Authority review has concluded:

- reliance (by the grid owner) on the results of low and medium power tests without identifying and assessing differences between the tests (and forthcoming high power tests) was an error
- the system operator should have more strongly challenged the grid owner's reliance on these assumptions
- there is insufficient evidence of appropriate formality and rigour in the system operator's risk assessment challenges of and discussion about the earlier tests prior to agreeing the high power testing
- if the grid owner's assumption (that the low and medium tests were indicative of performance at high power tests) had been questioned more strongly there is a possibility the AUFLS event could have been avoided.

While the review has not identified any Code changes which would have avoided the event it does conclude that the 'reasonable and prudent' obligation on the system operator should be extended to apply at times when the system operator is agreeing to test plans (currently the obligation applies to only some of the system operator Code obligations).

3. System Operator response

The system operator did strongly challenge the grid owner's views regarding testing and the degree of reliance placed on earlier testing to indicate performance in subsequent high power testing. The risk management framework provided for an agreed overall approach to managing risk and for each individual test to be separately considered and assessed. Assessment of each test was made at joint sessions between grid owner and system operator but nevertheless making clear the obligations and duties of each party.

The grid owner believed earlier Pole 3 and Pole 2 low and medium power testing showed there was a low risk of trip for the required high power tests of which the subject test was one, and didn't warrant treatment as an additional risk during testing. This position was not accepted by the system operator. Hence, the secondary risk status assigned to the relevant high power test (noting the assigned secondary risk status acknowledged the results of earlier testing as indicative rather than proof of future asset performance, until tested).

In hind sight, the system operator acknowledges more formality of recording the daily decision-making for each test could have been made. Had this been done the Authority may have reached a different view on the degree of challenge actually offered to the grid owner in relation to each test, including the test in question.

The grid owner and system operator both agree the incorrect implementation of control logic in the Benmore filter protection system would not have been discovered by any level of challenge presented by system operator to the grid owner. As acknowledged in the Authority's report, neither the grid owner nor the system operator knew of the consequences of the incorrect control logic implementation in the protection system. While true that installation of a fix for the September issue would have prevented the AUFLS event, neither party involved in assessing the earlier event considered it could lead to the events of 12th November 2013.

The system operator believes it acted in a reasonable and prudent manner planning for and managing Pole 3 and Pole 2 testing and in how it managed the project commissioning and testing activities, notwithstanding the Code does not currently import the RPO obligation to commissioning and testing activities. Nevertheless, the system operator supports the Authority's recommendation to extend the RPO obligation. This is a standard the system operator already holds itself to in all its actions.

John Clarke
General Manager System Operations
Transpower New Zealand Ltd