



Notice of market rule modification

Paper No.	EMC/RCP/14/2004/77
Rule reference:	Publishing Standing Probability Of Failure
Proposer:	Graham, NRG
Date received by EMC:	1 April 2002
Category allocated:	3
Status:	Approved by EMA
Effective Date:	13 September 2004
Summary of proposed rules change:	

This proposal is for the Standing Probability of Failure (SPF) of each GRF to be published. Following the RCP's recommendation not to support this proposal at its 8th meeting, the EMC Board requested the RCP to re-consider it. Following the re-consideration, the RCP supports a revision to the proposal to provide SPFs of each GRF to all market participants and the MSSL.

Date considered by Panel:	6 July 2004
Date considered by EMC Board:	29 July 2004
Date considered by Energy Market Authority:	27 August 2004
Proposed Rule Modification:	

Refer to attachment

Reasons for rejection/Reasons for referral back to Panel (if applicable):



PAPER NO. : **EMC/BD/04/2004/03(a)**

RCP PAPER NO. : **EMC/RCP/14/2004/77**

SUBJECT : **PUBLISHING STANDING PROBABILITY OF FAILURE**

FOR : **DECISION**

PREPARED BY : **POA TIONG SIAW**

VETTED FOR
QUALITY BY : **DR CHIAO YEN-SHONG
CHIEF ECONOMIST**

REVIEWED BY : **PAUL POH
GENERAL MANAGER, MARKET ADMINISTRATION**

DATE : **29 JULY 2004**

1. EMC Board referral back to RCP

“Rule Change Proposal 77: Publishing Standing Probability of Failure”

The EMC Board deliberated on the above rule change proposal on 10 Nov 2003. It disagreed with the RCP’s recommendation not to adopt NRG’s proposal to publish Standing Probability of Failure (SPF) from its 8th Meeting. Under Section 5.3.18 of Chapter 3 of the market rules, the Board has referred the matter back to the RCP for re-consideration.

Section 5.3.19 of Chapter 3 of the market rules provides that if the RCP’s recommendation remains that no rule modification is required, the EMC Board may decide against it but only when certain conditions apply. Please see Annex 2 for the details of these conditions.

The rule change paper to the EMC Board EMC/BD/06/2003/03(a) is attached.

Summary of RCP recommendation at the 8th RCP Meeting

The RCP’s recommendation was not to publish SPF of each generation registered facility. The basis for the recommendation was:

- The benefits sought are already available through other channels.
- Transparency is already amply provided by the publication of the methodology used in calculating SPF.

- On balance, there is negligible net benefit for the entire market in publishing the information.

2. The EMC Board's view

The EMC Board felt that the RCP should reconsider publishing information on SPF of each generation registered facility for the following reasons:

1. The collective nature of reserve cost allocation.
2. Market transparency is substantially enhanced, benefiting potential investors who have an interest in the reserve cost liability of generation units.

3. Further Analysis

In re-considering this rule change proposal, the principles adopted in EMC's information policy were used. The information policy was endorsed by the Rules Change Panel during the 10th RCP Meeting on 5 Dec 2003. The information policy framework applied below take into account the EMC Board's views and additional comments received from PowerSeraya following the EMC Board's request for the RCP to reconsider publishing the SPF.

3.1 Information Sensitivity Test

As a guide to whether information on standing probability of failure (SPF) of individual GRF's should be made releasable, we applied the Identity and Impact Tests under the adopted information policy. We conclude the following:

3.1.1 Identity Test

Information on standing probability of failure can be connected directly to a company. In this case, the name of the GRF is given. According to the information policy, where identity is revealed, the information is sensitive and necessitates the **Impact Test** below. The identified parties are also to be consulted on potential impact on them.

3.1.2 Impact Test

3.1.2.1 Financial

Information or data will be deemed to cause adverse financial impact if it:

- a) Causes the trading behavior of other market participants to alter in a manner that the identified party is financially disadvantaged;
- b) Causes the electricity market to behave in a way that financially disadvantages the identified party; and/or
- c) Causes the competitive position of the identified party to be disadvantaged vis-à-vis other parties.

Result of Consultation

PowerSeraya felt that SPF "is commercially confidential information. It can impact, not only our suppliers, but also our position in the market and could even result in increased costs to our company (eg. insurance premium) were it to be misinterpreted. It is additionally material to the valuation of our company and as such could be open to misinterpretation by a prospective purchaser."

Conclusion: If SPFs are interpreted wrongly, we agree that negative impact on generators such as higher insurance cost and lower asset valuation are plausible.

However, it is unlikely that the competitive position of a generator in the market would be unfairly affected especially if all generators have the same information.

3.1.2.2 Commercial

If the information or data is a trade secret by its nature, it will be considered to have adverse commercial impact.

Conclusion: Trade secret is irrelevant in this analysis.

3.1.2.3 Legal

- a) Whether the release is prohibited by any applicable Singapore law.
- b) Whether the release would adversely cause an impact on any contractual arrangement to which EMC is a party.
- c) Whether the release would adversely cause an impact on any contractual arrangement to which the identified party is a party.

Conclusion: There were concerns that the release of SPFs would allow inferences to be drawn on a generator's equipment supplier or maintenance provider. Hence, there could be implications from generators' supplier and maintenance contracts.

3.1.2.4 National Security

Information will be considered to have adverse impact on national security if it:

1. enables the identification of a critical power installation in the Singapore power system network; or
2. is key to locating a critical power installation and useful to a person planning an attack on the installation that can cause disruption or serious interference with public utilities.

Conclusion: Information on SPF does not result in any of the above.

3.2 Cost-Benefit Test

Benefits	Impact	Costs	Impact
Facilitation of investment decisions and use of resources:		Associated costs identified under the Impact Test:	
- Market efficiencies (static and dynamic) including:		Financial	<u>Potentially Negative</u>
<i>(a) demand and supply interaction</i>	Neutral	Commercial	Neutral
<i>(b) price discovery</i>	Neutral	Legal	<u>Potentially negative</u>

<i>(c) price signals (long and short term)</i>	Neutral	National Security	Neutral
- Transparency	Positive	Adverse impact on market efficiency	Neutral
- Credibility	Neutral		
Cost reduction	Neutral		
Strengthening of Market Design Principles (eg. Market Power Issues)	(Neutral)		

3.2.1 Benefits: Transparency/Dynamic Efficiency

Reserve costs are allocated collectively between generators based on the modified run-way model. In this model, the SPF of one GRF has a direct impact on the reserve cost allocated to another GRF. Hence, by knowing the SPF's of other GRF's, a GRF would have a better understanding of its own allocation of reserve cost. To minimize their reserve cost, generators would be incentivized to compete in improving the reliability of their equipment. This improves the overall efficiency of the market.

For the public at large, knowledge of SPFs gives little or no benefit.

3.2.2 Costs: Adverse Financial Impact and Potential Contractual Issues

The way in which the SPF is calculated and the technical complexity of its application open it to misinterpretation by the uninformed. One potential consequence cited was adverse impact on insurance premiums of a plant. Also, publishing SPF's may implicate a generator's plant and equipment suppliers. Although not fully substantiated, there could also be potential legal issues pertaining to contractual arrangements between a generator and its supplier.

On closer analysis, the above costs are associated with making the information available to the non-industry public that does not understand the statistic.

4. Conclusion

Through further analysis and consultation, we conclude that publishing the SPF of individual GRFs achieve the following benefits:

1. GRFs can compare their probabilities of failure with one another. This could incentivize generators to compete in making their equipment more reliable in order to reduce reserve cost.

However, potential misinterpretation of SPFs by non-industry members may result in:

1. Potentially adverse financial impact on generators.
2. Potential legal conflicts between a generator and its supplier.

We conclude that the availability of information on SPF is useful to generators to encourage competition. The benefit to the market is greater efficiency brought about by generators being incentivized to make their machines more reliable. On the cost side, there are valid concerns regarding misinterpretation by parties outside the industry. However, the risk of misinterpretation

can be avoided by making SPFs available only to market participants, who understand the statistic. Hence, SPFs should be classified as ¹R2 information as set out in the information policy document.

5. Legal sign off

Text of the rule modification has been vetted by EMC's legal counsel to reflect the intent of the rule change submission.

6. Recommendation

Hence, we recommend that the EMC Board:

- a. not adopt the original proposal to publish SPF's of all GRFs
- b. adopt EMC's counter-proposal to make SPF's of all GRFs available to all Market Participants and the MSSL as outlined in Annex 1 of this paper.
- c. recommend that the Authority approve this revised rule change proposal.
- d. recommend that the revised modification come into force 1 week after the date on which the approval of the Authority is published by the EMC.

¹ In the adopted Information Policy document, R2 information is defined as information that is useful only to market participants. It is to be provided to all MPs/PSO/MSSL where appropriate.

Annex 1: Proposed rule modifications

Existing Rules (Release 01 Jul 2004)	Proposed Rules (Deletion represented by strikethrough text and addition underlined.)
<p>A.7 of Appendix 7A of Chapter 7</p> <p>...</p> <p>A.7.3 For each <i>settlement interval</i>, the <i>EMC</i> shall use the data in the <i>probability of failure</i> register referred to in section A.7.2 and the size-ordering of <i>PCUs</i> for that <i>settlement interval</i> determined in accordance with section A.4 to determine the interval <i>probabilities of failure</i> or $IPF(z)$ and interval probability weights or $IPW(z)$ for each <i>PCU</i> as follows:</p> $IPF(z) = SPF(m(z))$ <p>where: $z = PCU\ z$</p> $IPW(z) = \sum_{i=1\ to\ z} IPF(i)$ <p>where: $z = PCU\ z$</p>	<p>A.7 of Appendix 7A of Chapter 7</p> <p>...</p> <p>A.7.3 For each <i>settlement interval</i>, the <i>EMC</i> shall use the data in the <i>probability of failure</i> register referred to in section A.7.2 and the size-ordering of <i>PCUs</i> for that <i>settlement interval</i> determined in accordance with section A.4 to determine the interval <i>probabilities of failure</i> or $IPF(z)$ and interval probability weights or $IPW(z)$ for each <i>PCU</i> as follows:</p> $IPF(z) = SPF(m(z))$ <p>where: $z = PCU\ z$</p> $IPW(z) = \sum_{i=1\ to\ z} IPF(i)$ <p>where: $z = PCU\ z$</p> <p><u>A.7.4 The EMC shall provide the standing probability of failure of each GRF to all market participants and the MSSL.</u></p>

ANNEX 2: Provisions for moving forward

Section 5.3.18 of Chapter 3 of the market rules states that if the RCP's recommendation is not to modify the rules, the EMC Board shall not adopt the modification unless it has referred the matter back to the RCP for re-consideration.

Section 5.3.19 of Chapter 3 states that if the RCP's recommendation remains that no modification to the rules is required, the EMC Board shall not decide in favour of the modification unless it determines that the modification would:

1. materially enhance the ability of the PSO to direct the operation or maintain the reliability of the PSO controlled system, which determination shall not be made by the EMC without the consent of the PSO;
2. materially enhance the ability of the EMC to operate the wholesale electricity markets in an efficient manner;
3. eliminate or materially reduce an undue preference that a market participant, a class of market participants or one or more market support services licensees may have in the wholesale electricity markets;
4. eliminate or materially reduce the opportunity for market participants, any class of market participant or market support services licensees to engage in inappropriate or anomalous market conduct, including the misuse or possible misuse of market power, gaming and collusion;
5. eliminate or materially reduce the costs of market participants, any class of market participants or market support services licensees; or
6. eliminate or materially reduce the costs of the EMC or the PSO.



PAPER NO. : **EMC/BD/06/2003/03(a)**

PAPER NO. : **EMC/RCP/08/2003/77**

SUBJECT : **PUBLISHING STANDING PROBABILITY OF FAILURE**

FOR : **DECISION**

PREPARED BY : **POA TIONG SIAW**

VETTED BY : **PAUL POH
GENERAL MANAGER, MARKET ADMINISTRATION**

DATE : **10 November 2003**

Executive Summary

This rule change proposal calls for EMC to publish the standing probability of failure for individual Generation Registered Facility (GRF). After considering the confidentiality of such individual GRF-related data and an indifferent cost-benefit analysis, the RCP recommends that the EMC Board **not adopt** the proposal.

1. Introduction

This rule change proposal by NRG calls for EMC to publish the standing probability of failure (SPF) associated with each generation registered facility (GRF). Section A.7.1 of Appendix 7A states that this probability value is determined using a methodology agreed between the PSO and EMC. The higher the SPF value, the higher reserve cost the GRF will be allocated.

2. Background

Standing Probability of Failure (SPF)

An SPF is used by the wholesale settlement system to determine the Reserve Responsibility Share (RRS) of each GRF that is not designated as a Secondary Contingency Unit (SCU). Essentially, the higher the value of SPF, the higher RRS will be computed for the GRF, resulting in higher reserve cost being allocated to it for settlement.

The methodology for calculating the SPF for each GRF is determined jointly by PSO and EMC. It is calculated as such:

$$\text{SPF} = [\text{Number of instances where this GRF trips off}] / [\text{Number of half-hourly periods where the metered quantities of this GRF} > 0]$$

3. Rule Analysis

3.1 Confidentiality

Confidential information is defined as such in the Market Rules:

Section 1.1.26 of Chapter 8:

confidential information means information which is or has been provided pursuant to the *market rules*, a *market manual* or the *system operation manual* which is **(a)** stated by the *market rules*, a *market manual* or the *system operation manual* to be confidential information; **(b)** otherwise confidential or commercially sensitive; or **(c)** derived from information referred to in (a) or (b), but shall not include information that is required by the *market rules*, a *market manual* or the *system operation manual* to be *published* by the *EMC* or the *PSO* or otherwise made available to all *market participants*;

SPF does not belong to the category described in **(a)**. Hence, we tested if the condition stated in **(b)** was applicable.

By default, EMC treats information it receives as confidential. This is in accordance with its Licence. For the release such information that can be directly connected to a party, EMC consulted Market Participants and the PSO on the various possible impact of making the information public.

On consultation, the PSO feels that SPF's are confidential statistics owned by the respective GRF's (see full comments in paragraph 8). It does not see any benefit publishing the statistics and asked that Generators be consulted.

One generator licensee responded that the release of information on SPF's could have commercial impact on its equipment supplier and service providers (see full comments in **Annex 2**). It believes that such information does not belong in the public domain. All other generator licensees were consulted but did not comment on the sensitivity of publishing the said information.

3.2 Benefits: Transparency Enhancement

Essentially, the SPF influences each GRF's share of the total cost of reserves, which is determined every half-hour. Generally, a GRF with a higher SPF will be allocated a larger share of reserve costs. Hence, the information has financial implications for generators. Publishing it makes the actual accounting for reserve costs clearer to market participants. Generators can make reliability comparison among themselves. Potential investors also have more information at hand to compare between generation units.

Non-GRF entities are not financially impacted by gaining knowledge of the SPF values of GRF's.

3.3 Cost of publishing

Physical resources needed to publish the information are not likely to be considerable.

3.4 Summary of Analysis

Table 1: Pro and Con Analysis

PRO's	CON's
<ul style="list-style-type: none"> • More information on generators readily available for competing generators, other market participants and consumers. 	<ul style="list-style-type: none"> • Confidential information • Little use for consumers/public • Added burden on EMC to publish information • Methodology of calculating SPF is published

Table 2: Alternative Sources for Benefits Sought

Party	Benefits Sought	Alternative Source
Generation Companies	<ul style="list-style-type: none"> • Information on competitors 	<ul style="list-style-type: none"> • Advisory notices on major equipment outage
Potential Investors	<ul style="list-style-type: none"> • Information on Generators 	<ul style="list-style-type: none"> • Approach individual generator
Market Participants	<ul style="list-style-type: none"> • Information on reliability of suppliers 	<ul style="list-style-type: none"> • Advisory notices on major equipment outage

The pro and con analysis in Table 1 shows real benefits exist for only market participants and potential investors. However, Table 2 also shows that the key benefits sought are already available from alternative sources. There is no significant increase in transparency of the market with the methodology of calculating SPF already published.

EMC treats information that can be directly connected to a person or company as confidential unless substantial public benefit justifies its release. On balance, there appears to be limited public benefit.

4. Conclusion

SPF's of individual GRF's are confidential information by default. A cost-benefit analysis does not justify the release of such confidential information because majority of the benefits sought are already available through other channels. Transparency is also amply provided by the publication of methodology in calculating SPF. On balance, there is negligible net benefit for the entire market in publishing the information.

5. Impact on market systems

The modifications (not supported) will not have any impact on the market systems operated by the EMC, PSO and MSSL.

6. Consultation

We have published the proposed text of modifications on the EMC website for comments and conducted a survey of all generation licencees on the impact of releasing the above-mentioned information. **Annex 2** contains the response to the survey.

PSO comments

"Probability of Failure are confidential statistics of Generators calculated by EMC based on records of forced outages of each GRF. It would be more appropriate to seek Gencos' view on publication of probability of failure (POF). For your info PSO currently send out notice on 'major equipment outage' - identifying GRF that tripped. POF affects only the reserve charges (not reserve prices, nodal prices or USEP) to Generators, not sure what additional benefit (esp. consumers) can be derived by publishing the POF of each GRF."

NEA's comments

"We are neutral regarding rule change proposals (77)."

Comments from PowerSeraya are attached in Annex 2.

7. Recommendations

The RCP recommends that the EMC Board

- a. **not adopt** NRG's rule change proposal to amend A.7.2 and A.3.2 of Chapter 7 as outlined in Annex 1 of this paper;

Annex 1: Proposed rule modifications

Existing Rules (Release 01 Jul 2003)	Proposed Rules (Deletion represented by strikethrough text and addition underlined.)
<p>A.7.2 of Appendix 7A (Chap 7)</p> <p>The <i>EMC</i> shall maintain and update as required a register indicating the standing <i>probability of failure</i> of each <i>GRF</i>, with:</p> <p>SPF(m) = Standing probability of failure of <i>GRF</i> m</p>	<p>A.7.2 of Appendix 7A (Chap 7)</p> <p>The <i>EMC</i> shall maintain, <u><i>publish</i></u> and update as required a register indicating the standing <i>probability of failure</i> of each <i>GRF</i>, with:</p> <p>SPF(m) = Standing probability of failure of <i>GRF</i> m</p>

ENERGY MARKET COMPANY PTE LTD

CONSULTATION SHEET ON RELEASE OF INFORMATION

Dear Market Participant,

EMC would like to consult relevant Market Participants when considering the release of certain market information. Please complete the following feedback form to register your concerns on the factors listed below.

For your views to be incorporated in our analysis, we request your response by:

10 Sept 2003.

Information to be released/published:

Standing Probability of Failure of each GRF

Cost/Impact on Market Participant

1. Financial (Impact on bottom-line/competitive position):

This can give information to our competitors that can help them evaluate our physical plant capabilities. This may operate to our disadvantage in the competitive spot market. We do not believe it to be the type of information that belongs in the public domain.

2. Commercial (Whether any trade secret is given away):

With the information on failure probabilities plant operational information can be inferred on our suppliers and or maintenance providers that is commercially sensitive. We would prefer not to be put in this position and would require confirmation from them that the release of such information to the public domain is acceptable.

3. Legal (Whether any agreement, contract or legislation is violated):

On the legal side we will need to perform a detailed evaluation of our supplier and maintenance contracts to ascertain whether our concerns voiced under item 2 above are justified.

4. Other:

Name: LOW BOON TONG
Senior Manager (Market Operations)

Company: POWERSERAYA LTD