

## Feedback on Proposed Modifications to the Transmission Code

<u>Modification Ref. No.</u>	<u>Section<sup>1</sup></u>	<u>Industry's Feedback</u>	<u>EMA's Assessment</u>
TC/2006/3	6.2.2	<p><b>Power Seraya:</b> In the development of the SOP, the parties involve may not necessarily be restricted to generation licensees and gas transporter, there is a high possibility that relevant parties such as the ORF Owner, gas importer and the exempted embedded generators are also required to be involved in the development of the SOP. As such, we would like to propose the new paragraph to be amended as follows:</p> <p>The <i>Power System Operator</i> shall develop a system level Standing Operating Procedure (SOP) for ensuring the secure operation of the power system in the event of natural gas supply disruption and revise the SOP from time to time, if necessary. The SOP shall be developed and revised by the <i>Power System Operator</i> in consultation with the <i>generation licensees</i> <del>and</del>, gas transporter <b><u>and any other relevant parties</u></b>. <i>Generation Licensees</i> with <i>generation facility</i> that uses natural gas as the primary fuel <b><u>and any other parties identified in the SOP</u></b> shall comply with this SOP.</p>	Accepted. The clause will be further amended accordingly.

<sup>1</sup> Reference to the section of the code where change is to be made in the version dated on August 2002 as published on the web.

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		<p>In developing the system level SOP, PSO should ensure that no one Genco is to be disadvantaged to be always the first one to initiate the changeover to alternative fuel. One way is for the PSO to consider generating facilities taking turns to be the first one to initiate switching to alternate fuel.</p> <p>In addition, we would like to seek clarification on the outcome envisaged from the common SOP. Is the intention to develop a common set of SOP to be applied equally to all relevant parties?</p> <p>If the system level SOP is to include the routine Gas-to-Diesel hotswitching tests, the interpretation of the sequential changeover test shall be clearly defined. For Gencos with "n" CCPP, does sequential test requirement mean all "n" CCPP has to be sequentially tested? To illustrate, does a Genco with 4 Combined Cycle Plants (CCPPs) have to do the hotswitching for all 4 CCPPs or "sequentially" takes the meaning of doing it for 2 CCPPs only, the other 2 CCPPs can be done at a different time and date?</p>	<p>The system level SOP would spell out the trigger for hotswitch by all relevant generation licensees. Whether which units should hotswitch first depends on factors such as minimum operating pressure of GTs, time required for hotswitch, distance from injection point, etc. The issue on rotation of units for hotswitch can be explored as part of the process to develop the system level SOP in response to the event of gas disruption incident.</p> <p>Yes, the system level SOP would spell out the minimum requirements (e.g. hotswitch test frequency, etc.) for compliance by all relevant generation licensees. The generation licensees should have their individual SOPs tailored to their respective power plants' operational requirement and meeting at least the minimum requirements in the system level SOP.</p> <p>EMA (PSO) will discuss this in further detail with the generation licensees in the SOP development.</p>

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		<p><b>Senoko Power:</b> The EMA should avoid being overly-prescriptive in managing the operations of generation licensees. Generation licensees have a commercial interest in maintaining reliable generation, particularly in the event of energy shortfall (caused by gas supply disruption or curtailment for example). Commercial penalties for unreliability are sufficient to deter generation licensees from lax risk management and mitigation. Adding regulatory penalties adds excessive and unnecessary burden on generation licensees.</p> <p>This modification also denies generation licensees the benefit and interest of sourcing for an alternative fuel as standby fuel. The imposition of the requirement for the fuel to be stock-piled on site restricts the choice of the alternative fuel to diesel. Natural gas-diesel switchover is a complex and highly-risky process and requiring switchover tests as frequently as once every quarter represents immense risk and damage to our operation and equipment.</p> <p>The EMA should set out a list of requirements imposed on an ORF facility to ensure its reliability and hence security of natural gas supply.</p>	<p>This provision is to ensure that all the individual SOP, developed by the generation licensees, can and will work at the system level. The system level SOP is to require the generation licensees to respond to a pre-determined procedures, to be developed collectively among the industry players, such that the risks of a major power failure associated with a gas disruption incident can be minimized and mitigated.</p> <p>The modification does not deny the generation licensees the opportunity of sourcing for an alternative fuel. Generation licensees can propose the alternative fuel that they would want to use that meets the objective of the system level SOP.</p> <p>EMA intends to license the ORF Operator, which would be required to comply with the relevant Code of Practices and Performance Standards that is being developed. Notwithstanding these measures, the risks of gas disruption incident are still present, and hence it is necessary to ensure that the generation licensees can and will hotswitch in accordance with the system level SOP.</p>

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TC/2006/4	6.11.2 (f)	<p><b>Tuas Power.</b> To delete “The generation facility shall continue to supply electricity to the power system after completion of the fuel changeover process”</p> <p>The fuel changeover is inherently a high-risk operation which involves the switching of gas to diesel at very high combustion temperature. The safety of the gas turbine is of highest concern during and after the fuel changeover. Hence, the control system of the gas turbine monitors very closely several operation parameters to ensure that the automated operation is performed in a safe manner without compromising the safety of personnel and machine. Should there be any substantial deviation in the parameters that are being monitored, the control system would trip off the unit automatically. Hence, it may be beyond our control to ensure that the generation facility continue to supply electricity after completion of the fuel changeover process.</p>	<p>This provision sets out the design requirement for a generating facility that uses natural gas as a primary fuel. Such design requirement shall also enable the generating facility to have the design capability for prolonged operation on an alternative fuel that is stockpiled on-site. The system level SOP would require Generation licensees to conduct periodic hotswitching test for operational readiness, with the aim to minimize the risks of the generation facility not being able to continue to supply electricity after completion of the fuel changeover process. This is necessary to ensure system security following a gas disruption incident.</p> <p>The proposed deletion is not accepted.</p>

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TC/2006/4	6.11.2 (f)	<p><b>Power Seraya:</b> The current draft of the proposed modification is placing an onerous responsibility on the generation facility to ensure that the fuel changeover test must be 100% success rate.</p> <p>We would like to bring to the attention of EMA that there is no 100% success in a changeover operation even with regular testing and the generation companies can only ensure that it is successful on a best endeavor basis.</p> <p>For the interest of providing the most economic electricity to consumer, the Transmission Code should not restrain a generation unit from the right to run down its machine after the successful changeover if it has the capability to run up other economic machines to fill the shortfall unless the generating facility is compensated financially. The current draft is not clear whether this is allowed because it can be interpreted to say that the generation facility is required to continue to supply after changeover,</p>	<p>This provision sets out the design requirement for a generating facility that uses natural gas as a primary fuel. Such design requirement shall also enable the generating facility to have the design capability for prolonged operation on an alternative fuel that is stockpiled on-site. The system level SOP would require Generation licensees to conduct periodic hotswitching test for operational readiness, with the aim to minimize the risks of the generation facility not being able to continue to supply electricity after completion of the fuel changeover process. This is necessary to ensure system security following a gas disruption incident. If the hotswitching test fails, then corrective action would need to be taken and hotswitching test re-conducted to ensure the operational readiness of the generating facility to respond to a gas disruption incident.</p> <p>After successful hotswitch to alternate fuel, should the Generation Licensee decide to run up other economical generation facilities to replace the prevailing generating units after fuel changeover, they could seek PSO's approval on de-synchronisation of their hotswitch units and synchronization of non-natural gas units as per the Market Rules and System Operation Manual. PSO would grant generation licensee's request only if system security is not compromised.</p> <p>The proposed amendment is not necessary.</p>

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		<p>As such we would like to propose the following amendments:</p> <p>Each <i>generation facility</i> that uses natural gas as the primary fuel shall be designed with the capability of initiating on-load changeover either automatically through gas pressure setting or manually to alternate fuel that is stockpiled on-site.</p> <p>The fuel changeover trigger setting shall have sufficient margin above that of the <i>generation facility's</i> low gas pressure trip setting to ensure that the <i>generation facility</i> remains connected to the power system and operates at or above its minimum stable loading level during the entire process of fuel changeover operation. The <i>generation facility</i> shall, <b><u>based on its best endeavor</u></b>, continue to supply electricity to the power system after completion of the fuel changeover process. <b><u>The generation facility shall continue to supply electricity to the power system after completion of the fuel changeover process until such time when the respective Genco is able to replace the prevailing generation load of the natural gas units with non natural gas units.</u></b></p>	
		<p><b><i>Senoko Power.</i></b></p> <p>The requirements specified in TC/2006/4 fail to take into account technical concerns of the generating units on at least two counts.</p>	

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		<p>a) Gas-to-liquid fuel switchover is a complex process. To prescribe the requirement of a gas-liquid fuel switchover as a form of risk mitigation against gas supply disruption shows a short-range perspective. Instead of requiring the responsible party to ensure the reliability of gas supply, generating units are indirectly penalised by having to incur additional costs and technical risks in order to perform the tests. We believe the responsible party should be held accountable for gas supply reliability; and,</p> <p>b) The modification requires the fuel changeover setting to have sufficient margin so that it operates at or above its minimum stable loading level during the changeover operation. The design of some generating units requires reducing the load of the unit below minimum stable load for gas-diesel changeover. This is a technical limitation that is inherent in the generating unit and allowance should be made for such limitation.</p> <p>Certain generation units may technically not be able to maintain MSL during gas-diesel changeover. This is a technical limitation inherent in the design of the units. Suggest to amend to "The fuel changeover trigger setting... ensure that the generating facility remains connected to the power system and operates <b><u>to meet the scheduled load after completing the fuel changeover operation.</u></b>"</p>	<p>a) EMA intends to license the ORF Operator, which would be required to comply with the relevant Code of Practices and Performance Standards that is being developed. Notwithstanding these measures, the risks of gas disruption incident are still present, and hence it is necessary to ensure that the generation licensees can and will hotswitch in accordance with the system level SOP.</p> <p>b) The Minimum Stable Load (MSL) requirement is to ensure the system would not have excessive reduction in capacity when units hotswitch, especially during gas supply disruption where multiple units would undergo hotswitch almost simultaneously. Rapid and excessive reduction in capacity of multiple generating units would compromise security of the power system. Generation licensees with existing units not meeting this requirement could seek temporary exemption via established procedures.</p> <p>The proposed amendment is not accepted.</p>
TC/2006/5	6.12.3	<b>SPPG:</b> "...shall be backup..." -> ...shall be backed up... ?	Accepted. The clause will be amended accordingly.

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		<p><b>Tuas Power:</b> The Transmission Licensee shall provide the communication lines from the Generation Licensees communication equipment up to the surge arrestors in the PSO's Control Centres.</p> <p><b>Power Seraya:</b> There is no mention of the type of communication lines preferred although it is mentioned in H3 that telephone line can be used.</p> <p>As the Remote Monitoring and Automatic Generation Control is vital to the security of the Power Industry and the communication lines form part of the Power Industry infra-structures, it will not be wise to rely on telephone lines supplied by Telcos as during time of power system emergency the performance of the telephone lines is dependent much on the availability of power supply to the Telcos.</p> <p>We would like to propose for the communication line to be pilot wire provided by the Transmission Licensee from PSO up to the agreed location in the generation facilities. The telephone lines should be used only as a last resort.</p>	<p>Accepted. The provision will be further amended to reflect that "The Transmission Licensee shall provide data communication lines from the control centers of the Power System Operator to the transmission substation and power station switchhouses as specified by the Power System Operator for the purposes of real-time power system monitoring and control."</p> <p>Accepted. The provision will be further amended to reflect that "The Transmission Licensee shall provide data communication lines from the control centers of the Power System Operator to the transmission substation and power station switchhouses as specified by the Power System Operator for the purposes of real-time power system monitoring and control."</p>
TC/2006/6	6.12.6	<b>SPPG:</b> Please define "Interruptible Load Provider".	Accepted. The definition of Interruptible Load Provider will be included accordingly.

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		<p><b>Power Seraya:</b> There is no mention of the type of communication lines to be provided by the Load Provider.</p> <p>We propose that the type of communication lines are specify in the requirement.</p>	The details of the type of communication lines are specified in the System Operation Manual.
TC/2006/8	6.13.1	<b>SPPG:</b> "its" -> their?	Accepted. The clause will be amended accordingly.
TC/2006/10	6.14.1	<p><b>Power Seraya:</b> There is no mention of the type of communication lines to be provided by the Load Provider</p> <p>We propose that the type of communication lines are specify in the requirement.</p>	The details of the type of communication lines are specified in the System Operation Manual.

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TC/2006/11	C6	<p><b>Power Seraya:</b> (applies to all proposed modifications for this section, i.e. C6.1 –6.9)</p> <p>We note the additional requirement for a Combined-Cycle Plant with Multi-shaft Configuration for consideration as multiple independent Generation Facilities proposed by the EMA.</p> <p>In accordance with the Transmission Code Section 1.6.1(a)(ii), we would like to understand from the EMA the rationale for the need to include the current modification when it is not originally required in the Transmission Code i.e. what has changed in the market that warrants such a change?</p> <p>Based on our understanding, a Combined-Cycle Plant with Multi-shaft configuration is the most efficient configuration and the proposed change appears to be running in contrary to the spirit of the NEMS, where efficiency is a key driver for efficient market operation, by discouraging such planting through the excessive penalty at the reserve market.</p> <p>We would like to understand from the EMA on whether a cost-benefit analysis on this proposal has been conducted to see if the benefits for system security outweigh the potential benefits that a multi-shaft configuration will bring to Singapore.</p>	<p>The proposed amendment is to provide clarity to the requirements for Combined-Cycle Plant with Multi-shaft Configuration. This requirement is not new. It has been the practice since year 2000.</p>
TC/2006/12	C6.1	<p><b>SPPG:</b>"Where each Generation..." -&gt; may want to change to "Each Generation..." ?</p>	<p>The clause will be further amended to “, where each Generation...”.</p>
TC/2006/14	C6.3	<p><b>EMC:</b> There is no acceptance criterion stipulated in the System Operation Manual (Revision 3).</p>	<p>The acceptance criterion will be included in the next revision of System Operation Manual.</p>

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TC/2006/19	C6.8	<p><b>EMC:</b> It is not clear that the PSO is expected to <u>finish</u> such review within 20 business days, or to just <u>review</u> the report within 20 business days. Please confirm which one is intended and make that clear.</p> <p>Suggest that the word "register" not be used because the word "register" under the Market Rules connotes the registration process which is carried out by EMC. Since the TC here is referring to PSO's activity, we suggest that the word "operate" be used in place of "register".</p>	<p>For clarity, C6.8 shall be further amended to "PSO shall use its best endeavours to complete the review of the final report submitted within 20 business days. Upon <i>PSO's</i> acceptance of the submitted report, the <i>Generation Licensee</i> shall submit standing capability data of the <i>Combined-cycle Plant</i> to <i>PSO</i> for approval to operate as multiple independent <i>Generation Registered Facility</i>."</p>
TC/2006/20	C6.9	<p><b>EMC:</b> The word "register" would invoke the whole registration process under the Market Rules, which is not intended. EMC suggests using the word "operate".</p> <p>According to this C6.9, the <i>Generation licensee</i> is only required to <u>submit</u> revised standing capability data (SCD) to PSO within 24 hours from the outage incident. There is no other timeframe set for PSO and EMC regarding when these revised data should take effect. Also, this process means that there will be time required for PSO to approve the SCD and transmit it to EMC. EMC would then require time to update the revised SCD.</p> <p>However, from earlier discussion with PSO, our understanding is that PSO intended for the revised SCD to <u>take effect</u> within one business day from the outage incident. In view of the above process, this timeframe is not feasible.</p> <p>EMC wishes to emphasize that:</p> <ol style="list-style-type: none"> <li>a. before the revised SCD is updated in EMC's system, the CCP would still be treated as multiple independent facilities.</li> <li>b. under the current metering arrangement, EMC needs about 3 business days to update the revised SCD. If the additional metering requirement on the CCP as discussed with PSO is in place, the revised standing data may take 2 business days to update if there are many changes. The earlier discussion that a timeline of one business day is achievable was based</li> </ol>	<p>Agreed. Instead of the proposed changes to standing capability data and metering arrangement, the last paragraph of this section will be amended to "PSO may notify <i>EMC</i> of any change to the system risk attributable to one or more <i>generation facilities</i> of the <i>Combined-Cycle Plant</i>. On <i>PSO's</i> notification, <i>EMC</i> shall, in accordance with the <i>market rules</i>, determine risk and operating reserve requirement taking into account such change in system risk. The <i>Generation Licensee</i> shall identify the cause of tripping, take necessary remedial actions and re-test to verify its compliance to the requirements stipulated in Appendix C6.3. A detailed report shall be submitted to <i>PSO</i>. Upon <i>PSO's</i> acceptance of the submitted report, <i>PSO</i> shall notify <i>EMC</i> of the revised system risk attributable to such <i>generation facilities</i>. <i>EMC</i> shall, in accordance with the <i>market rules</i>, determine risk and operating reserve requirements taking into account such change in system risk."</p>

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		<p>on the understanding that there are pre- approved SCDs residing in EMC's systems and EMC would only need to change the Maximum Generation Capacity to switch from 2 GRFs to 1 GRF or vice-versa.</p>	
		<p>EMC also wishes to emphasize that rule changes would have to be in place before any multi to single-unit switchovers can be operationalized in the wholesale market. Provisions would have to be made for how a multiple-GRF CCP switches to operate as a single GRF and vice-versa.</p> <p>In addition, policy needs to be set on how the standing probability of failures and reserve provider groups assigned to independent multiple GRFs would be assigned to the combined single GRF and vice-versa.</p> <p>We assume the report is submitted "to PSO" rather than "by PSO". In addition we suggest some drafting changes for clarity. Thus please consider the following drafting:</p> <p><b>"Upon PSO's acceptance of the submitted report , the Generation Licensee shall submit revised standing capability data of the Combined-cycle Plant to PSO for approval to operate as multiple independent Generation Registered Facility"</b></p>	<p>Agreed. The clause will be further amended as above.</p>

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		<p><b>SembCorp Cogen:</b>  <u>System Security</u>  The amendment as proposed by PSO was intended to enhance system security. However, this proposal C6.9 will not achieve the intended purpose as it failed to take into account commercial trading implications.</p> <p>To demonstrate the above implication, we like to use the example of our Co-gen configuration. In the event that one of our GT tripped resulting in the tripping of our ST; we will be treated as 1 CCGT set of 800MW according to the proposed rule. Given this situation, it will be highly unlikely that we will operate at the same level as we were treated as 2 separate set. Assuming that we can subsequently restart our 2 CCGT which are be capable of generating 700 MW of power; we will most likely offer not more than 300 MW if we are being treated as 1 set. This is due to the way NEMS market rule on the reserve cost allocation to the risk setting set. This commercial behavior will seriously impact the total operational generation capacity to the system as a result of this proposal.</p> <p>Moreover, the proposed revision is counter-intuitive to PSO's objective to maintain overall system reliability i.e. Gensets that have tripped should aim to revert to normal operations as soon as possible instead of limiting to a 24hr period subject to passing reliability tests.</p>	<p>A CCP can be treated as multiple logical units so long as it can operate independently. If this condition can no longer be met, then spinning reserve must be provided to cater to the outage of the CCP, as if it is a single unit, without compromising system security. The generation licensees would have to manage between the amount of capacity to be dispatched and the allocation of spinning reserve based on the associated output. The NEMs would provide the pricing signals to enable the generation licensees to make a commercial decision, while ensuring that minimum system security requirements are met.</p> <p>The proposed Code change does not prohibit the affected Combined Cycle Plant from returning to service after tripping even before passing the reliability test. The relevant CCP can still continue to participate in the market except it would not be considered as multi-unit facility but a single Generation Facility for the purpose of reserve scheduling by the Market Clearing Engine.</p>

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		<p><u>NEMS Market Rules &amp; Technical Limitation Currently inadequate to implementing Proposal</u></p> <p>NEMS Market Rules on Failure Probability Factor (FPF) and Reserve Effectiveness (RE) need to be changed to support this proposal. Under the proposed change, our 2 CCGT may be combined into 1 CCGT, the current rules are not capable of computing the RPF &amp; RE for the combined set. New rules need to be adopted by the Rule Change Panel to ensure that NEMS Market Rules are capable to manage dynamic reconfiguration of genset.</p> <p>The implementation of vesting contracts is partially to encourage the investments to the more efficient CCGT technology. The current methodology does not account for the risks involved in PSO's proposal. Should the revisions in the Transmission Code be considered, the methodology in the determination of the LRMC should also be reviewed to maintain the original intention of vesting contracts.</p> <p>The Market Clearing Engine (MCE) is designed to optimize the total cost of power and reserves. This linear programming function will prevent a large generation set from a high power dispatch as it will also concurrently escalate the need for reserves for NEMS. The proposal C6.9 will greatly reduce the efficient price discovery of the MCE as the most secure and cost effective solution for power dispatch will be compromised by the amalgamation of gensets.</p>	<p>Agreed. Once the Code change has been approved, EMC will have to initiate market rules change to implement the revised Code requirements.</p> <p>The objective of vesting contract is to control market power and not for the purpose as indicated to encourage the investments to the more efficient CCGT technology.</p> <p>Generation licensees would have to manage between the amount of capacity to be dispatched and the allocation of spinning reserve based on the associated output.</p>

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		<p>There is an inherent technical problem in the Market Clearing Engine (MCE) to manage dynamic change in genset standing data. The current MCE will only be able to effect any change in standing data at midnight. This will posed as a system risk to the PSO as 2 gensets may be reclassified into 1 genset due to C6.9, but the system will only be able to reflect it in the MCE at midnight. Likewise, any reclassification of the same genset into 2 sets will also be effected at midnight; thereby disadvantaging that genset.</p> <p>The method of allocating the reserve costs is already a method of penalizing the unreliable gensets by penalizing the bottom line. The current rules have sufficient provisions to manage genset reliability through the allocation of a higher reserve charge against the less reliable genset. The proposed modification to the transmission code would only serve as additional penalty to the gencos.</p> <p>These rules have served the market well and have the support of all the players. These rules have also been recognized by other international electricity markets as good market design. There is little need for the adoption of C6.9 amendment as it will compromise our efficient market design.</p>	<p>The feedback is noted. PSO will take this matter up with EMC.</p> <p>The objective of this code change is to ensure there is sufficient reserve to cater for tripping of the largest on-line unit. A CCP that is treated as multiple independent generation facilities would cause the Market Clearing Engine to schedule just sufficient reserve to cover tripping of one of the 'independent generation facilities'. Should simultaneous tripping of multiple 'independent generation facilities' occur, it would show that the CCP could not operate as what the generation licensee claimed to be capable of. This would compromise security of the power system. Hence, to ensure system security, the CCP would have to be treated as one CCP so that the MCE can schedule sufficient reserve to cover forced outage of the multiple 'independent generation facilities'.</p>
		<p><u>Dispensation and Grandfathering Principle</u></p> <p>Our investment in steam &amp; power generation (co-gen) was a result of close collaboration with EDB to support the utilities requirements on Jurong Island. The key consideration for the type of generating asset that we had invested was based on the utilities needs of investors on Jurong Island. The initial investment objective was to provide reliable energy at low cost to attract foreign investors into Singapore.</p> <p>Participating in a merchant market (NEMS) was not a consideration at the point of investment. Subsequent to our investment, EMA started the Singapore Electricity Pool (SEP) to encourage the development of a merchant market. Dispensation</p>	<p>It is the intent of Section C6 to allow CCP with Multi-shaft Configuration to be considered as multiple independent generation facilities. This is similar to what SembCogen is treated for its cogen plant on the basis that the 2 logical sets can operate independently of each other. However, from a system perspective, the CCP will be treated as a single unit if the logical units cannot operate independently of each other. Under such circumstances, adequate system reserve must be provided to cater to the loss of the entire CCP to maintain system security.</p>

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		and grandfathering principle were being put in place to ensure that participating Gencos with investment made PRIOR to the start of the market will be able to compete on a level playing field.	
		SembCogen were given dispensation to treat our cogen as 2 logical sets to encourage our participating in pool trading. In 2003, EMA started the National Electricity Market of Singapore (NEMS) to replace the less efficient SEP. The grandfathering principle was applied on us as EMA recognized the importance of our cogen being treated as 2 logical sets to remain commercially viable in NEMS.	EMA would clarify that there was no grandfathering/ dispensation granted to SembCogen as the NEMS allows its CCP to be treated as 2 logical sets, as long as it can be proven technically that the generating set can operate as 2 independent generation facilities. This proposed modification to the Code is to formalise the abovementioned existing arrangement.

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		<p>The proposal of C6.9 will set a precedent for increasing regulatory risk in our current framework as it works against some of the founding principles of our power market. This may be viewed by investors as a huge regulatory risk in their evaluation of our genco privatization program.</p> <p><u>Technical Limitations</u></p> <p>If Section C6.9 is implemented, to change the configuration from 3 blocks to 1 block, SembCogen needs to make several modifications to the hardware and software.</p> <ol style="list-style-type: none"> <li>1. An AGC signal software is used to proportionately control the GT &amp; ST loads. The vendor for this software is currently located in Hong Kong and time is needed to effect the modification to the software. At present we receive two separate AGC signals for each block to control the load. To modify the DCS AGC software we need OEM ALSTOM 's expertise, to execute this which may take at least one week,</li> <li>2. The metering system for Mark 6 meters need to be modified to calculate as one block, to implement this software modification and to conduct a trial run may take at least one week. The meters have to show accurate readings which are consistent with the readings taken at MSSL.</li> </ol>	<p>This requirement is not new. It has been the practice since year 2000.</p> <p>PSO will work with EMC to address the feedback.</p>
		<p><u>On-Going Works to Improve Reliability</u></p> <p>SembCogen has also been carrying out its own projects to ensure continuous improvements in the reliability of our plant.</p> <p>A reliability department was set up in Feb 2006 with a staff of 9 persons to look into areas where SembCogen can improve the reliability of our plant. This department ensures that we are continuously improving and not stagnating on the issues</p>	

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		<p>regarding plant reliability and subsequently system stability.</p> <p>Steam supply is a crucial part of the Cogen plant. SembCorp's initial investment in Jurong Island was with the intention to provide reliable steam supply to attract investors who require steam energy. During a GT outage, steam supply would be sufficiently reduce and the reduction would cause subsequent outages in our customer's operations. As part of SembCogen's efforts to improve reliability, 2 initiatives had already been taken.</p> <p>ST Runback tests – These tests once completed would allow stable operation of the ST in the event of a GT outage. This would imply that in the event of an outage, the load output would not be drastically reduced as the ST will remain in full operation. SembCogen had incurred huge costs to carry out these tests which are estimated to take another 1 year to complete.</p> <p>VHP Boiler - To ensure the reliability of steam supply to foreign investors, SembCogen had embarked on a S\$56 mil initiative to install a VHP boiler to continuously supply steam to our customers despite a forced outage. This VHP boiler would also tie in with the ST Runback tests where the boiler would supply steam in an outage to maintain the energy output from the ST unit thus improving the reliability of energy supply. This project is estimated to complete in 2008.</p>	
		<p>SembCorp takes the position that while it understands and agrees with PSO's desire to improve system stability of the Singapore Energy supply, the above points should be seriously taken into consideration before the implementation of the amendment to Section C6.9.</p> <p>It is advantageous to the local energy market that changes are made and systems are tuned and</p>	<p>This Code modification applies to all generation licensees with CCP being treated as multiple 'independent generation facilities' by the Market. SembCogen's efforts to improve reliability of its CCP is noted. However, it is equally important that the MCE schedules sufficient reserve to cover forced outage of the multiple 'independent generation facilities' if it could happen. This is to ensure system security.</p>

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		upgraded to handle the proposed amendment to Section C6.9. SembCorp also requests PSO to take into consideration the several initiatives taken by our company to operationalize the reliability environment before the implementation of the amendment.	
		<b>Keppel Energy:</b> It appears unreasonable to register as a single GRF within 24 hours from the outage incident. The cause of the incident needs to be ascertained before a need to re-register as a single GRF. Should another outage incident occur within 3 calendar months from date of first incident while investigation is under way, then it may warrant a stiffer approach of re-registration as a single GRF.	The system spinning reserve is only to cater for tripping of the largest online generation facility. Security of the power system should not be put at risk while the generation licensee is investigating the multiple tripping incident.
TC/2006/21	H2.2	<b>SPPG:</b> GPS -> Global Positioning System. SPPA can comply with the proposed modification for new RTUs, but not for the old RTUs with no GPS capability. SPPA will ensure compliance when the old RTUs are replaced.	The existing RTUs will be exempted from complying with this section. However new RTUs to replace existing ones must comply.
		<b>Tuas Power:</b> The requirement for GPS clock shall be applicable to new RTUs that are going to be installed following approval of the Proposed Modification to the Transmission Code and not applicable to the already installed.	The existing RTUs will be exempted from complying with this section. However new RTUs to replace existing ones must comply.
		<b>Power Seraya:</b> All existing RTU should not be subjected to this requirement as the older equipment may not be able to be GPS synchronised.  The amendment shall apply to new installation or existing RTU that need to be upgraded.	The existing RTUs will be exempted from complying with this section. However new RTUs to replace existing ones must comply.

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		<p><b>Senoko Power</b> (applies to Section H2.2 &amp; H5.2 and all related sections on technical requirements):</p> <p>Technical requirements made subsequent to this amendment can only apply to new units coming in after the implementation of the amendment, as existing installations were designed and installed according to the requirements of the Transmission Code prevailing at the time of installation.</p> <p>For example, amendment TC/2006/21 requires each dedicated RTU to be equipped with a GPS for time synchronization and ref TC/2006/26 requires the status of all earthing switches to be of 1-bit representation.</p>	<p>The existing RTUs will be exempted from complying with this section. However new RTUs to replace existing ones must comply.</p>
TC/2006/22	H4.2	<p><b>Senoko Power.</b> Clarification is required on the definition of "natural gas transmission pipeline supply natural gas to the generation facility". Would generation licensees be required to comply with this requirement?</p>	<p>This refers to the transmission pipeline that supplies the natural gas to the generation facility. All Generation Licensees will need to comply with the amended H4.2.</p>
TC/2006/25	H5.1	<p><b>Tuas Power.</b> The requirement for 1-bit representation for earthing switches shall be applicable to new SCSs that are going to be installed following this approval of the modification to the Code and shall not be applicable to those already installed.</p>	<p>The representations of existing earth switches will be exempted from complying with this section. However new RTUs to replace existing ones must comply.</p>
TC/2006/25	H5.2	<p><b>Tuas Power.</b> The requirement for 1-bit representation for earthing switches shall be applicable to new SCSs that are going to be installed following this approval of the modification to the Code and shall not be applicable to those already installed.</p>	<p>The representations of existing earth switches will be exempted from complying with this section. However new RTUs to replace existing ones must comply.</p>

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		<p><b>Senoko Power</b> (applies to Section H2.2 &amp; H5.2 and all related sections on technical requirements):</p> <p>Technical requirements made subsequent to this amendment can only apply to new units coming in after the implementation of the amendment, as existing installations were designed and installed according to the requirements of the Transmission Code prevailing at the time of installation.</p> <p>For example, amendment TC/2006/21 requires each dedicated RTU to be equipped with a GPS for time synchronisation and ref TC/2006/26 requires the status of all earthing switches to be of 1-bit representation.</p>	<p>The representations of existing earth switches will be exempted from complying with this section. However new RTUs to replace existing ones must comply.</p>
NEW		<p><b>EMC:</b> The current Modification section does not present what is being modified. The reader has to compare the original text against the modification text to determine what is being modified. This is tedious. Suggest that EMA indicate, in future, what is being modified e.g. deletion represented by strikethrough and additions underlined.</p>	<p>EMA will indicate clearly the modifications being made to clauses in future.</p>