



DECISION PAPER

REGULATORY FRAMEWORK FOR REPORTING OF NEAR MISSES

1 NOV 2017

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1 Background

- 1.1. EMA intends to develop a framework for electricity licensees (namely the Transmission Licensee and Generation Licensees) and gas licensees (namely the Onshore Receiving Facility Operator Licensee, the LNG Terminal Operator Licensee, the Town Gas Producer Licensee and the Gas Transporter Licensee) (collectively “Licensees”) to report near misses to EMA. Reporting of near misses is essential in preventing future incidents from taking place, by sharing learning points among licensees to enhance condition monitoring, operation and maintenance practices, electrical cable/gas pipeline damage prevention measures, and for gathering key information for data analytics to identify root causes and weaknesses in the system.
- 1.2. A consultation paper was put up on EMA’s website on 4 Apr 2017 to seek industry’s views on the proposed framework for reporting of near misses. Feedback were received from 10 respondents when the consultation closed on 5 May 2017.

2 Industry Consultation

- 2.1. EMA has carefully considered the feedback and our corresponding responses are detailed in [Appendix 1](#). Feedback are summarised in the paragraphs below together with EMA’s responses.

Definition of near miss

- 2.2. In the consultation paper, EMA had proposed to define the term “near miss” as an incident that did not result in, but could have resulted in failure or mal-operation of equipment, plants, facilities or electrical cables/gas pipelines, power failure or voltage dip, a decrease in available generation capacity, disruption in gas supply, or that could have given rise to vulnerability in the electricity system or gas supply system.
- 2.3. A common feedback was that the proposed definition of “near miss” is too broad. There were concerns that Licensees may end up reporting a wide range of near misses, regardless whether the incident could have caused a major or minor impact. There were also views that the Licensees should not be required to report near misses that occur during commissioning or re-commissioning of new plants and equipment. In addition, averted equipment failures observed or discovered during maintenance or condition monitoring should not be classified as reportable near misses.

- 2.4. Taking into consideration the above feedback, EMA will revise the definition of “near miss” as follows:

In the Transmission Code:

“Near miss” means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.”

In the Gas Supply Code:

“Near miss” means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines, or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.”

Mandatory requirement for reporting of near misses

- 2.5. Licensees commented that there is already an existing platform (i.e. the Electricity and Gas (E&G) Forum) where they have been voluntarily sharing their experiences on the operation of their plants. As such, there is no need for EMA to impose a requirement for the Licensees to report near misses to EMA.
- 2.6. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.
- 2.7. As mentioned in the consultation paper, this framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities. Licensees therefore should not be discouraged from reporting near misses to EMA.

Sharing of commercially sensitive and/or proprietary information

- 2.8. Licensees also raised their concern that the requirement to share near miss incidents with other licensees might lead to sensitive or proprietary information being given away.
- 2.9. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary as necessary.

Timeline to submit near miss reports

- 2.10. Licensees have also sought EMA's clarification on the timeline for submission of near miss reports to EMA.
- 2.11. To allow for sufficient time for a Licensee to investigate the near miss incident and come up with appropriate corrective measures, EMA will allow Licensees to submit near miss reports to EMA within 4 weeks from the occurrence of the near miss incident. Any request for extension of time will be considered on a case-by-case basis.

3 EMA's Decision

- 3.1. EMA has carefully considered the feedback from the industry and has decided to put in place a near miss reporting framework as detailed below.
- 3.2. Under the near miss reporting framework, Licensees will be required to report incidents of near misses to EMA. Licensees will also be required to collate reports of near misses encountered by their contractors while working on the Licensees' cable / pipeline / equipment / plant / facility, and submit these reports to the EMA.
- 3.3. Upon the occurrence of a near miss, a Licensee shall investigate into the incident and thereafter implement corrective measures to prevent the recurrence of such near miss. Licensees shall prepare the near miss report using the format as set out in Appendix 2, and submit the near miss report to EMA within 4 weeks from the occurrence of the near miss incident. The reporting template essentially requires Licensees to provide a brief description of the near miss incident, the causes, as well as the mitigating measures to prevent recurrence of the incident.
- 3.4. EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, EMA will facilitate the sharing of learning

points arising from selected near miss incidents with other Licensees through a sharing platform such as the E&G Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary information as necessary.

- 3.5. This framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.
- 3.6. The modifications to the Transmission Code and Gas Supply Code to effect the near miss reporting framework are set out in Appendix 3. The modifications will come into effect on 17 Nov 2017.

Appendix 1

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
TC/2017/1	Modification to clause 1.3.1	PacificLight Power Pte Ltd	<p>The proposed paper provides a definition of "near miss" which can guide Generation, Transmission and Gas Licensees in identifying and preparing reports on the occurrence of such incidents. Given the proposed definition is very broad, licensees may end up reporting a wide range of near misses, regardless of whether the potential incident would have had a major or minor impact. To ensure that focus is given to relevant data that could cause significant impact and to enable parties to provide data of maximum value, PLP would propose that the definition of near miss be more clearly defined such that the scope of a near miss depends on the severity and potential to cause significant impact to the Singapore electricity network.</p>	<p>Taking into consideration PacificLight Power Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p>
TC/2017/2 GSC/201/1	New clauses 6.1.4 (TC) 19.5 (GSC)	PacificLight Power Pte Ltd	<p>PLP is fully supportive of ensuring the safety and reliability of the Singapore electricity system through information sharing and exchange of relevant data amongst the industry. To date, this has been successfully achieved through platforms such as the Electricity and Gas Forum (E&G). We would propose that forums such as the E&G forum continue to be used for the management of information relating to near miss incidents.</p> <p>Under the proposed modification, licensees which are covered by the Transmission Code and Gas Supply Code will be required to submit near miss reports as well as lessons learnt, which could also be shared to other licensees. Consistent with practices currently used by the WSH for the reporting of near miss incidents in the construction industry we would propose that the requirement for near miss reporting be removed from the Transmission Code and Gas Supply Code and be made non-mandatory.</p>	<p>EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p> <p>EMA would also like to clarify that this framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
TC/2017/1	Modification to clause 1.3.1	ExxonMobil Asia Pacific Pte Ltd	<p>ExxonMobil operates gas turbine generators primarily for internal usage, but exports excess power to the grid as an embedded generation facility. In comparison to on-purpose generation of electricity for supply to the grid, the exported quantity by ExxonMobil is small. Due to the nature of our manufacturing processes, ExxonMobil also has a large number of internal loads (for example, the Singapore Chemical Plant is made up of ~4000 units) which can fluctuate from time to time.</p> <p>With respect to the consultation paper, ExxonMobil notes the following points that will either pose challenges from a compliance perspective or needs further clarification:</p> <ol style="list-style-type: none"> 1. The reporting obligation should be further considered for embedded generation sites, given the smaller impact to the grid 2. The definition of Near Miss should be further clarified for embedded generator facilities. Do the reporting criteria only include the power generation units and associated transmission equipment to the grid? Or does it include the internal loads as well? 3. We wish to clarify on the reporting obligation. Is it mandatory or in the spirit of this proposed framework, which is to share and learn with no attached blame/liability either from incident impact or reporting perspective? 4. The cut off reporting requirement in terms of impact should be clarified as well. This will help to prioritize focus on incidents of higher learning value as well as make it clear for licensees on what to report 5. The sharing of the incident learnings may result in giving away of proprietary information pertaining to operating configuration/processes. The nature of the sharing, especially with market participants other than EMA, should be voluntary and at no detriment to the reporting party 6. Recommendations arising from the incident should be implemented at the discretion of the reporting party, provided 	<ol style="list-style-type: none"> 1. Taking into consideration ExxonMobil Asia Pacific Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows: <u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i> <u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i>
TC/2017/2	New Clause 6.1.4			

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
			<p>there is no violation of regulatory codes, such as the Transmission Code</p> <p>7. The timeline of reporting should be clarified to ensure there is clarity in requirements</p>	<p>4. EMA had considered requiring Licensees to only report near misses of incidents with higher impact (e.g. incidents which could have caused forced outage of more than 1 generating unit) but has decided against it. This is because incidents of such nature are rare. If we restrict the framework to such incidents only, Licensees will not be able to learn and benefit from each other for lower impact near misses which could also pose a threat to the reliability of the power system.</p> <p>We however note the industry's feedback that the definition of "near miss" should be more focused. We will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>5. As for the concern on giving away sensitive and/or proprietary information, EMA would like to clarify that EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, EMA will facilitate the sharing of learning points arising from selected near miss incidents with other licensees through a sharing platform such as the Electricity and Gas Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of</p>

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				<p>information which may be commercially sensitive and/or proprietary as necessary.</p> <p>6. EMA is of the view that near misses are incidents which could potentially pose a threat to the reliability of the power system. As such, we would require Licensees to implement the necessary corrective measures to prevent the recurrence of such near miss.</p> <p>7. To allow for sufficient time for Licensees to investigate into the near miss incident and come up with the appropriate corrective measures, EMA will allow Licensees to submit the near miss report to EMA 4 weeks upon the occurrence of the near miss incident. Any request for extension of time will be considered on a case-by-case basis.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
TC/2017/1	Modification to clause 1.3.1	YTL PowerSeraya Pte Ltd	<p>Imposing compulsory "near miss" reporting will add significantly to regulatory compliance costs. EMA should consider implementing a beefed up voluntary regime of "near miss" reporting such as by the introduction of voluntary surveys as well as scheduling sharing by industry participants and OEMs at the Electricity and Gas Forum. If and only if such a beefed up voluntary regime does not yield a satisfactory outcome, then should EMA look into implementing a compulsory regime.</p> <p>There should be thresholds for reporting so that only significant near miss incidents are reported to avoid wasting time and resources reporting minor incidents.</p> <p>Possible thresholds could be for incidents that if had occurred would have resulted in load shedding or incidents that could have resulted in the forced outage of more than 1 generation facility.</p>	<p>EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p> <p>Taking into consideration YTL PowerSeraya Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>EMA had considered requiring Licensees to only report near misses of incidents with higher impact (e.g. incidents which could have caused forced outage of more than 1 generating unit) but has decided against it. This is because incidents of such nature are rare. If we restrict the framework to such incidents only, Licensees will not be able to learn and benefit from each other for lower impact near misses which could also pose a threat to the reliability of the power system.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
TC/2017/2	New Clause 6.1.4		If the information related to the near miss incident is proprietary in nature or commercially sensitive, it should be shared only with the Authority and authorised agents, subject to the imposition of appropriate confidentiality safeguards.	EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, we will facilitate the sharing of learning points arising from selected near miss incidents with other Licensees through a sharing platform such as the Electricity and Gas Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary as necessary.
GSC/2017/1	New Clause 19.5		If the information related to the near miss incident is proprietary in nature or commercially sensitive, it should be shared only with the Authority and authorised agents, subject to the imposition of appropriate confidentiality safeguards.	EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, we will facilitate the sharing of learning points arising from selected near miss incidents with other Licensees through a sharing platform such as the Electricity and Gas Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary as necessary.

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General	NA		<p>While Tuaspring agrees with initiatives in "spirit of enhancing the power and gas systems' reliability", we believe there would be more appropriate ways of enhancing engagement of the industry, to promote sharing of lessons learnt, instead of making it onerous on industry participants in a merchant energy market environment, by setting it as a Regulatory requirement.</p> <p>In a liberalized electricity market like Singapore's, it is in the interest of industry participants to perform or procure works in accordance to international standards of practices, guidelines and act as a prudent operator of their facilities, to ensure high reliability of their assets and to maintain profitability. This would similarly apply to asset owners of the gas system.</p>	<p>EMA notes that Licensees are required under the Transmission Code to maintain and operate their installations to ensure that they do not cause any adverse impact to the stability, security and reliability of the power system. EMA also notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p>
TC/2017/1	Modification to clause 1.3.1	Tuaspring Pte Ltd	<p>The proposed definition for "near miss" is too generic, broad and all-encompassing, which seemingly includes most if not all incident(s), that occurs within the boundaries of facilities operated by Licensees, and within the vicinity of such facilities and electricity and gas infrastructure. The definition seems more onerous than the reporting requirements of other jurisdiction, eg. MOM's Workplace Safety and Health (WSH).</p> <p>While we understand the intent of the proposed reporting framework and the underlying spirit, a definition that would potentially apply to any actions or inactions performed by Licensees' operators and their contractors would not be meaningful to both the industry and the Regulator. The Regulatory body would not be able to objectively assess when and if such actions or inactions should be classified as a "near miss" and importantly, whether Licensee have contravened their Licence Condition to comply with Code requirements.</p>	<p>Taking into consideration Tuaspring Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p>
GSC/2017/1	New clause 19.5		<p>At present, EMA has the right to request for an enquiry (and has regularly exercised such rights) into any incidents to further understand the actions taken by Licensees. Under both the Electricity Act and Gas Act, the Authority or any authorised officer is empowered to obtain information from any person, including Licensees, and Licensees are required to comply.</p>	<p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>Example of incident classified as near miss:</p> <p><u>Electricity near miss</u> An employee observed that there was a puddle of water in a switchroom. Upon closer observation, he realised that water was</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
			<p>In the interest of industry efficiency, we request that EMA reconsiders the appropriateness of implementation of this reporting framework through the Codes. We also request the EMA provides clarity and examples on how incidents should be classified as "near miss" and which are not.</p>	<p>leaking from the ceiling and there were water droplets on the switchgear cladding. Even though the water did not cause the switchgear to trip, the staff should raise this as a near miss incident. The accumulation of water on the switchgear cladding over prolonged period might result in water seeping into the switchgear and eventually causing a switchgear fault. The Licensee should investigate into the source of water and put in place measures to prevent the leaking of water into the switchroom.</p> <p><u>Gas near miss</u> An employee was to carry out routine maintenance for a gas facility. As part of the maintenance, the employee was required to shut certain valves before performing the necessary maintenance on the equipment. While the employee was about to isolate one of the valves, the employee was stopped by another employee nearby. This was because the employee was about to shut the wrong valve and this would have led to the tripping of equipment which will lead to a disruption in send-out. The Licensee should review its current SOPs and ensure its employees are well briefed during toolbox briefing on the steps in carrying out such isolation work in order not to cause any undue safety concerns to maintenance crew and gas supply disruption.</p> <p>Example of incident <u>not</u> classified as near miss: An employee, while performing maintenance duties, noticed that the insulation resistance readings for a power cable is very low. He records his observation and decided not to energise the cable. He then proceeds to arrange for follow-up action to repair/replace the power cable. As stated in our definition of "near miss", the Licensee need not report this incident as the faulty power cable was discovered via maintenance duties.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
General			<p>The requirements for reporting a near miss should not be included in the Transmission Code. There are established industry platforms, eg. the Electricity and Gas Forum, where Licensees can be encouraged to share description of the near miss incidents, corrective measures and timeline to implement the measures. Such requirements may be included in the notice to attend the relevant industry forums. Including provisions to foster learning lessons in the Transmission Code, which carries liabilities and penalties for breaches, will discourage genuine sharing and learning from each other. We believe that the most effective learning should be done voluntarily in a forum.</p> <p>If however EMA decides to amend the Transmission Code to include reporting of near miss, our detailed comments on the proposed modifications are as follow:</p>	<p>EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p>
TC/2017/1	Modification to clause 1.3.1	Tuas Power Generation Pte Ltd	<p>i. The definition of a near miss is too wide and subject to interpretation as it includes, amongst other things, failure of equipment that could give rise to vulnerability in the electricity system. Without knowledge of the vulnerability in the electricity system that is being addressed, Licensees with complex installations with a large number of equipment, like a power station, will have difficulty in understanding when to report a near miss incident. Equipment failures (or possible failure), given the large number of equipment, cannot be reported in every instance. This is especially relevant since many such instances are managed sufficiently well to prevent forced outage of a generating unit.</p> <p>ii. Greater clarity on the vulnerability in the electricity system being addressed, eg a near miss incident that did not result in but could have caused more than one generating unit to suffer a forced outage, etc is required for the definition of a near miss to be included in the Transmission Code.</p> <p>iii. Near miss related to commissioning of new plant and equipment, or their re-commissioning, should be exempt due to inherent instability of plant during the tuning processes involved in such works.</p>	<p>Taking into consideration Tuas Power Generation Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p>

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TC/2017/2	New Clause 6.1.4		<p>i. Due to the vagueness of the definition of a near miss (as commented above), the increased regulatory risk for a Generation Licensee, due to possible inadvertent non-compliance to the proposed change in Transmission Code, is unacceptably high.</p>	<p>Taking into consideration Tuas Power Generation Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follow:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p>

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TC/2017/2	New Clause 6.1.4	SP Group	<p>The introduction of a Near Miss Reporting framework should not require any new clauses to be added to the Transmission Code and Gas Supply Code because it would create barriers to the reporting of Near Miss and not align with best practices in establishing a Near Miss Reporting System.</p> <p><u>1) Near Miss Reporting is Best Achieved through Voluntary Reporting and not be Prescriptive through Code Modification</u></p> <p>SP PowerAssets ("SPPA") and PowerGas acknowledge that tracking Near Miss events and taking remedial action is one of the proactive step to prevent future incidents that could give rise to vulnerability in the electricity system or gas supply system.</p> <p>Unlike incident reporting, Near-Misses are only known by the individual(s) involved who chose to report or not report the incident. Some of the main barriers to the reporting of Near-Misses include the fear of being blamed, disciplined, embarrassed, or found legally liable. A successful Near Miss reporting framework would be one that create a culture of reporting with no negative ramifications.</p>	<p>1) EMA would like to clarify that this framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities. This is in line with Workplace Safety and Health's (WSH) recommended approach of creating a no-blame culture for reporting of near misses.</p> <p>It was also noted from WSH's guide that in order to establish a strong reporting culture, the support of senior management is important. The senior management of each Licensee can begin by creating a policy and communicating it to all employees. WSH also suggested to include near miss reporting as part of the employees' job scope. The inclusion of near miss reporting as part of an employee's job scope is akin to making near miss reporting a requirement for employees. On this end, EMA's near miss reporting framework is incorporated as a requirement in the Transmission Code and Gas Supply Code. This is in line with WSH's recommended approach to establish a strong reporting culture.</p>
GSC/2017/1	New Clause 19.5			<p>The National Safety Council in their publication dated 2013 (see attached) has established that the best practices in establishing a Near Miss Reporting System is one that needs to be non-punitive, and if desired by the person reporting, anonymous.</p> <p>Similarly, the Workplace Safety and Health ("WSH") Council in Singapore encourages Near Miss Reporting. It publishes a "Guide to Near Miss Reporting" to help companies establish a robust framework within the organisation (see attached) and has also echoed the need for a no-blame culture for a successful reporting framework. Based on our understanding, WSH Council has not made near miss reporting mandatory via any change in legislation or regulation.</p> <p>Our research on other liberalised electricity and gas market in Australia and UK has not shown any precedent of mandatory Near Miss Reporting by the regulator on their licensees.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
			<p>EMA proposal to introduce a Near Miss Reporting via the amendment to the Transmission Code and Gas Supply Code is contrary to the best practice of a “non-punitive” approach for a successful launch of a Near Miss Reporting framework because under Section 14 of the Electricity Act and Section 19 of the Gas Act, any contravention of the provision in any code of practice (which includes the Transmission Code and Gas Supply Code) could lead to the imposition of financial penalty.</p> <p>We recommend EMA not to implement a Near Miss Reporting Framework via a modification to the Transmission Code and Gas Supply Code. Instead, it should be introduced on a voluntary basis. In terms of approach, a guide-book, similar to WSH Council, can be considered for the electricity and gas markets in Singapore.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Near-Miss-Reportin g-Systems.pdf</p> </div> <div style="text-align: center;">  <p>WSH Near Miss Reporting.pdf</p> </div> </div> <p><u>2) Sharing of Learning Points from Near Misses can be Achieved through Voluntary Sharing at Existing Forum</u></p> <p>SP PowerAssets (“SPPA”) and PowerGas acknowledge that sharing of learning points of Near Misses among licensees will enhance the reliability of the power system and gas systems.</p> <p>An Electricity and Gas Forum is held annually by EMA for the industry players to share operational experiences. Licensees had been forthcoming to share their valuable experiences, without compromising their commercial interest, when approach by the organiser in previous Electricity and Gas Forum. There is no provision in the Transmission Code or Gas Supply Code that stipulated the requirement to share operational experiences. The light-handed approach has worked well to-date and we urge EMA to extend the same approach towards the sharing of learning points of Near Misses among licensees.</p> <p>In the spirit of enhancing the power and gas systems’ reliability, EMA can include the sharing of Near Misses and learning points</p>	<p>reporting framework within their organisations for employees to report near misses to their management, notwithstanding EMA’s requirement. As such, the implementation of EMA’s near miss reporting framework should not pose any significant cost increase to the Licensees.</p> <p>4) Taking into consideration SP Group’s and other licensees’ feedback, EMA will be revising the definition of “near miss” as follows:</p> <p><u>In Transmission Code:</u> <i>“Near miss” means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>“Near miss” means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>Example of incident classified as near miss:</p> <p><u>Electricity near miss</u> An employee observed that there was a puddle of water in a switchroom. Upon closer observation, he realised that water was leaking from the ceiling and there were water droplets on the switchgear cladding. Even though the water did not cause the switchgear to trip, the staff should raise this as a near miss incident. The accumulation of water on the switchgear cladding over prolonged period might result in water seeping into the switchgear and eventually causing a switchgear fault. The</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
			<p>as a permanent agenda item in the annual Electricity and Gas forum moving forward.</p> <p><u>3) Licensees should be allowed to recover cost of Near Miss Reporting if this is to be implemented</u></p> <p>All cost incurred to implement EMA's Near Miss Reporting framework by the Transmission Licensee and Gas Transporter Licensee should be fully recoverable as an exogenous expenditure.</p> <p><u>4) Scope and Obligations of Near Miss Reporting should be properly defined and clarified</u></p> <p>The definition of "Near Miss" in the proposed modification is extremely wide. To report all Near Misses is onerous, administratively burdensome and costly.</p> <p>It will be more cost effective and pragmatic if the type of Near Misses that warrants reporting ("Reportable Near Miss") be clearly defined and documented in a guide book that the EMA can develop in consultation with the industry.</p> <p>For instance, the type of incidents that warrants reporting should be limited to those that would affect the transmission network for gas and electricity system. Also, adverted equipment failures being observed or discovered or suspected during maintenance or condition monitoring works should not be classified as reportable near-misses.</p>	<p>Licensee should investigate into the source of water and put in place measures to prevent the leaking of water into the switchroom.</p> <p><u>Gas near miss</u> An employee was to carry out routine maintenance for a gas facility. As part of the maintenance, the employee was required to shut certain valves before performing the necessary maintenance on the equipment. While the employee was about to isolate one of the valves, the employee was stopped by another employee nearby. This was because the employee was about to shut the wrong valve and this would have led to the tripping of equipment which would lead to a disruption in send-out. The Licensee should review its current SOPs and ensure its employees are well briefed during toolbox briefing on the steps in carrying out such isolation work in order not to cause any undue safety concerns to maintenance crew and gas supply disruption.</p> <p>Example of incident <u>not</u> classified as near miss:</p> <p>An employee, while performing maintenance duties, noticed that the insulation resistance readings for a power cable is very low. He records his observation and decided not to energise the cable. He then proceed to arrange for follow-up action to repair/replace the power cable. As stated in our definition of "near miss", the Licensee need not report this incident as the faulty power cable was discovered via maintenance duties.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
General	Nil	Shell Eastern Petroleum Pte Ltd	<p>1) The sharing and learning of near-misses can be voluntary rather than mandatory. Please explain the Authority's reasoning, including consideration of both pros and cons, to make the reporting of near-misses mandatory. Please elaborate on the Authority's previous initiatives to encourage voluntary sharing and learning of near-misses, and the outcome of each of those previous initiatives.</p> <p>2) The suggested definition of "near miss" appears too all-encompassing, e.g. "could have given rise to vulnerability in the electricity system or gas supply system" appears subjective and vague. In the context of mandatory reporting as suggested in the Consultation Paper, the threshold of what makes an incident a reportable near-miss, or not a reportable near miss, would need to be more objectively defined for all potentially affected classes and sub-classes of stakeholders.</p> <p>3) The Authority's process of analysis, sharing and learning needs to be more clearly outlined, including considerations for confidentiality, responsibilities, timeline, etc..</p> <p>4) How will duplication or overlap of reporting effort be minimised or avoided, e.g. in light of reporting requirements to PSO, EMC/MAU/MSCP, NEA, MOM, etc.?</p> <p>5) Is there a hierarchy of reporting requirements? Please elaborate on the suggested TC 6.1.4(b) and GSC 19.5(b) and how different they are from what is already covered by the suggested TC 6.1.4(a) and GSC 19.5(a)?</p> <p>6) What is the Authority's realistic expectation of submission timeline of near-miss report for each occurrence of a near-miss, for proper investigation and improvement plan to be detailed?</p>	<p>1) EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p> <p>2) Taking into consideration Shell Eastern Petroleum Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>For the purposes of this clause, embedded generating units are exempted from this requirement. This is because embedded generating units are small generating units and the electricity produced are for internal consumption only.</p> <p>3) Upon the occurrence of a near miss, the Licensees shall investigate the incident and thereafter implement corrective measures to prevent the recurrence of such near miss. The Licensees shall prepare the near miss report using the format as</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
				<p>set out in Appendix 2, and submit the near miss report to EMA within 4 weeks from the occurrence of the near miss incident. The reporting template essentially requires the Licensees to provide a brief description of the near miss incident, the causes, as well as the mitigating measures to prevent recurrence of the incident.</p> <p>EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, EMA will facilitate the sharing of learning points arising from selected near miss incidents with other licensees through a sharing platform such as the Electricity and Gas Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary as necessary.</p> <p>4) EMA's near miss reporting framework essentially requires Licensees to report near misses (as defined) to EMA, and in the spirit of enhancing the power and gas systems' reliability, require Licensees to share selected near misses with other Licensees through a sharing platform. These near misses are incidents which could have posed a risk to the reliability to the power or gas system. There is no duplication or overlap in reporting requirement of such incidents imposed by PSO, EMC/MAU/MSCP, NEA, MOM etc.</p> <p>5) Under the proposed new clause 6.1.4(a), Licensees shall report any near miss to EMA within 4 weeks from the occurrence of the near miss incident. Whereas under the proposed new clause 6.1.4(b), Licensees will also be required to collate reports of near misses encountered by their contractors while working on the Licensees' cable / pipeline / equipment / plant / facility, and submit these reports to EMA within 4 weeks from the occurrence of the near miss incident.</p> <p>6) To allow sufficient time for Licensees to investigate into the near miss incident and come up with the appropriate corrective measures, EMA will allow Licensees to submit the near miss report to EMA 4 weeks upon the occurrence of the near miss incident. Any request for extension of time will be considered on a case-by-case basis.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
General	Nil	Keppel Merlimau Cogen Pte Ltd	<p>Keppel's view is that the definition of near miss and the scope that is covered is too generic. Thus we would like to request EMA to provide more detail and clarity in order for us to better assess the proposed framework.</p> <p>The information provided may be useful in improving the system. However, we would like to be mindful of the fact that some information may be commercially sensitive.</p>	<p>Taking into consideration Keppel Merlimau Cogen Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>EMA will review the near miss reports submitted, and in the spirit of enhancing the power and gas systems' reliability, EMA will facilitate the sharing of learning points arising from selected near miss incidents with other Licensees through a sharing platform such as the Electricity and Gas Forum. To protect commercially sensitive and/or proprietary information from being shared, EMA will work with the Licensee to prepare the information to be shared, including masking of information which may be commercially sensitive and/or proprietary as necessary.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
GSC/2017/1	New Clause 19.5	Singapore LNG Corporation Pte Ltd	<p>SLNG supports EMA's efforts to encourage the industry to share and learn from incidents to enhance the reliability of the gas supply system.</p> <p>1) However 'codifying' the reporting of near misses in the Gas Supply Code which makes it a regulatory obligation on the licensees may be counter-productive. Without certainty that these reports would not be interpreted and used in the wrong way or against them, licensees could be hesitant to report near misses to the Authority.</p> <p>2) Furthermore, how would the Authority track whether all near misses are being reported by licensees?</p> <p>3) Hence SLNG recommends that reporting and sharing of near misses be conducted on a voluntary basis, such as adopting the approach taken by the petrochemical and oil & gas industries where companies produce Lessons Learnt Reports and share them freely amongst industry players.</p>	<p>1) On Singapore LNG Corporation Pte Ltd's concern that the near miss reports would potentially be interpreted and used in the wrong way or against them, EMA would like to clarify that the near miss reporting framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.</p> <p>2) EMA will not be able to track near misses as they are incidents which did not cause any impact to the power or gas systems. However, if it is found that a near miss had occurred and the Licensee had not reported the occurrence of the near miss, EMA will investigate and take regulatory action against the Licensee if necessary.</p> <p>3) EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
TC/2017/1	Modification to clause 1.3.1	Senoko Energy Pte Ltd	<p>1. The proposed definition of "Near miss" is very broad and relies on assessments of probability that are likely to be subjective and in certain circumstances would rely on an individual licensee's knowledge of the consequential impacts of the failure of a certain component of their operations on the electricity system or gas supply in general.</p> <p>2. For example, a Genco does not have the full visibility on the dynamics of the power and gas systems. Hence, a Genco may not consider an incident that occurred at a power station to be a near miss because of an assumption that the power system is designed with N-1 contingency protection. However, the PSO having the full visibility and information may consider the incident as a near miss. Similar situation apply to the gas transmission system. We are concerned that the non-reporting of such incident by a Genco due to differences in interpretation or lack of full information will be considered as a breach of the Transmission Code and Gas Supply Code and thereby suffer a penalty.</p> <p>3. As such, to avoid potential breach of the Code, we will require more dedicated resources like personnel, time, efforts to analyse every fault notification or incident reported by employee or contractor to determine if it falls under the broadest possible "near miss" definition and to follow up as required under the Code. This will increase business costs which will ultimately need to be passed on to the end consumer.</p> <p>4. The collation of reports of near misses encountered by related contractors will have to be on the basis of best endeavor as we are dependent on contractors to submit the reports and some of which may be engaged for a short term.</p> <p>5. To resolve the issues identified above we suggest the following:</p> <ul style="list-style-type: none"> i. The definition of "near miss" be significantly narrowed, clarified and supported by guidance so that only incidents that would unambiguously have a significant impact on the security and stability of the electricity and gas systems are reported. ii. Licensees not be at risk of penalty for non-reporting of near misses, given that EMA's intent appears to be for a no-liability reporting regime. 	<p>1) Taking into consideration Senoko Energy Pte Ltd's and other licensees' feedback, EMA will be revising the definition of "near miss" as follows:</p> <p><u>In Transmission Code:</u> <i>"Near miss" means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p><u>In Gas Supply Code:</u> <i>"Near miss" means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</i></p> <p>2) Please see our response in Point 1.</p> <p>3) Under the respective licence conditions, Licensees are responsible for the maintenance and operation of their respective installations to ensure that there is no adverse impact to the stability, security and reliability of the power and gas systems. Notwithstanding EMA's requirement for near miss reporting, the Licensees would, as a good industry practice, have already implemented a near miss reporting framework within their organisations for their employees to report near misses to their management. As such, the implementation of EMA's near miss reporting framework should not pose a significant cost increase to the Licensees.</p> <p>4) EMA will require Licensees to collate reports of near misses encountered by their contractors while working on the Licensees' cable / pipeline / equipment / plant / facility, and submit these</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
				<p>reports to the EMA. Licensees should have a framework in place to require contractors to report near misses to them.</p> <p>5) i) Please see our response in Point 1.</p> <p>ii) EMA would like to clarify that this framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.</p>
TC/2017/2	New Clause 6.1.4		<p>1. Senoko supports sharing of lessons learnt from the investigations into incidents that had occurred and exchanges of experiences on technical matters. Senoko has been participating in the Electricity and Gas (E&G) Forums organised by PSO. The E&G Forum can be further enhanced to incorporate lessons drawn from specific near miss incidents for sharing that will be meaningful to participating organisations.</p> <p>2. An alternative is for a dedicated work-group (e.g., as has been implemented for Cyber Security) to be established to manage the collection of such reports and organise the sharing lessons without having to amend the Transmission Code and Gas Supply Code to compel a licensee to comply. The Ministry of Manpower and Workplace Safety and Health Council jointly published "Guide to Near Miss Reporting" and strongly encourages all companies to tap on the benefits of near miss reporting but does not implement it via regulatory framework.</p> <p>3. If a modification to the Transmission Code and Gas Supply Code is deemed necessary to effect the sharing of lessons learnt, the intention of not determining/apportioning blame or liability should be clearly stated in the Code.</p>	<p>1) EMA notes that Licensees currently participate in and voluntarily share their experiences on the operation of their plants at the Electricity and Gas Forum. While there has been some voluntary sharing of operational experiences at the E&G Forum, EMA is of the view that there is scope for greater sharing among the Licensees, particularly learning points from near miss incidents. EMA has thus decided that the reporting of near misses should be made mandatory under the Transmission Code and Gas Supply Code.</p> <p>2) EMA would like to clarify that this framework is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities. This is in line with Workplace Safety and Health's (WSH) recommended approach of creating a no-blame culture for reporting of near misses.</p> <p>It was also noted from WSH's guide that in order to establish a strong reporting culture, the support of senior management is important. The senior management of each Licensee can begin by creating a policy and communicating it to all employees. WSH also suggested to include near miss reporting as part of the employees' job scope. The inclusion of near miss reporting as part of an employee's job scope is akin to making near miss reporting a requirement for employees. On this end, EMA's near miss reporting framework is incorporated as a requirement in the Transmission Code and Gas Supply Code. This is in line with WSH's recommended approach to establish a strong reporting culture.</p>

Modification Ref. No.	Clause	Public/Industry	Comments	EMA's Response
				<p>3) EMA has taken into consideration Senoko Energy Pte Ltd's and other Licensees' feedback, and has included a clause in the Transmission Code and Gas Supply Code stating that EMA's intention for the near miss reporting framework is not to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.</p>

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Section III – Corrective measures

Description of corrective measure(s) and timeline to implement the measure(s)

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Submitted by: _____

Designation: _____

Date: _____

Table 1: Proposed Modifications to the Transmission Code

Modification Ref. No.	Clause	Proposed Modification	Reasons
TC/2017/1	Modification to clause 1.3.1	<p>To modify clause 1.3.1 by inserting, immediately after the definition of “master-metered installation” and immediately before the definition of “network”, the following definition:</p> <p>“Near miss” means an unplanned incident that did not result in, but had the potential to cause either a power failure, voltage dip, damage to electrical cable, outage of generating unit/transmission equipment, or decrease in available generation capacity/transmission capacity. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</p>	Inclusion of definition of “near miss”.
TC/2017/2	New clause 6.1.4	<p>To insert, immediately after clause 6.1.3, the following new clause 6.1.4:</p> <p>“The Transmission Licensee and Generation Licensees shall:</p> <ul style="list-style-type: none"> (a) report any near miss to the Authority within 4 weeks from the occurrence of the near miss; and (b) collate reports of near misses encountered by their contractors while working on the licensees’ cable/equipment/plant/facility, and submit these reports to the Authority within 4 weeks from the occurrence of the near miss. <p>The Authority may, where it considers necessary, require a licensee to share the learning points of the near miss with other licensees. For the purposes of this clause, embedded generating units are exempted from this requirement.</p> <p>The reporting of near miss is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.”</p>	<p>To include provision for reporting of near misses by licensees, for the purposes of preventing future incidents from taking place, for sharing of learning points among licensees to enhance condition monitoring and maintenance practices, and for gathering key information for data analytics to identify root causes and weaknesses in the system that resulted in the circumstances that led to the near misses.</p> <p>Sharing of learning points of near misses among licensees will help in enhancing the reliability of the power system.</p>

Table 2: Proposed Modifications to the Gas Supply Code

Modification Ref. No.	Clause	Modified Text	Reasons
GSC/2017/1	New clause 19.5	<p>To insert, immediately after clause 19.4, the following new clause 19.5:</p> <p>“The Licensee (namely the Onshore Receiving Facility Operator Licensee, the LNG Terminal Operator Licensee, the Town Gas Producer Licensee and the Gas Transporter Licensee) shall:</p> <ul style="list-style-type: none"> (a) report any near miss to the Authority within 4 weeks from the occurrence of the near miss; and (b) collate reports of near misses encountered by their contractors while working on the licensees’ pipeline/equipment/plant/facility, and submit these reports to the Authority within 4 weeks from the occurrence of the near miss. <p>The Authority may, where it considers necessary, require the Licensee to share the learning points of the near miss with other key stakeholders in the gas industry.</p> <p>For the purposes of this clause, “near miss” means an unplanned incident that did not result in but had the potential to cause either a failure or mal-operation of equipment, plants, facilities or gas pipelines, or partial/total disruption in gas supply. A near miss does not include averted equipment failures observed or discovered or suspected through maintenance, condition monitoring, commissioning or re-commissioning works.</p> <p>The reporting of near miss is not intended to determine/apportion blame or liability, but is for the industry to share and learn from the incidents and make necessary improvements so as to enhance the reliability of their equipment and plants/facilities.”</p>	<p>To include provision for the reporting of near misses for the purposes of preventing future incidents from taking place, for sharing of learning points among licensees to enhance condition monitoring and maintenance practices, and for gathering key information for data analytics to identify root causes and weaknesses in the system that resulted in the circumstances that led to the near misses.</p> <p>Sharing of learning points of near miss among licensees will help in enhancing the reliability of the gas supply system.</p>