**ATCO Access Arrangement Network Reinforcement Projects**

Dear Robert and Tyson

In reply to the Economic Regulation Authority's Draft Decision (450 to 453) on ATCO's Access Arrangement Submission ( "Draft Decision"), dated 14 October 2014, Energy*Safety* offers the following, suggested amendment so to ensure that ATCO is given an opportunity to continue to comply with the technical regulatory requirements and its associated safety case.

**Summary**

1) As discussed in the meeting in April 2014, ATCO is required to construct, design, operate and maintain its network under a safety case regime as per AS/NZS4645.1:2008. ATCO is obliged to comply with the Gas Standards Act 1972 and the regulations that require meeting or exceeding AS/NZS4645.1:2008 Gas Distribution Networks.
2) The most important part of the Safety Case is the Formal Safety Assessment (FSA). The FSA should also include a risk register. An interruption of the supply of gas with catastrophic consequences is one of those risks that should feature in the register if that risk applies to a network.
3) In mid-2013 ATCO carried out flow modelling in order to determine various interruption of supply scenarios in this case from incidents involving the steel gas distribution gas main feeds. ATCO advised Energy*Safety* of the need to carry out various reinforcement projects during meetings around that time. ATCO has not updated its FSA and Risk register as yet, these revisions will be rolled into the next revision of the Safety Case which would be more likely in 2015 as this revision might be brought forward.
4) In the draft decision the report would indicate that these projects are not going to proceed and in that justification, it would further appear that the draft decision has used the risk model of AS/NZS2885.1: Pipelines-Gas Liquid and Petroleum and a Quantitative Risk Assessment. Just as an observation; if a quantitative risk assessment was a viable decision making tool (which it is not in this instance), it would appear that the costs to society of such major outages have not been included either. Therefore if businesses are shutdown, hospitals closed or buses are prevented from running these all amount to very high societal costs that should be included in any cost/benefit analysis.
5) If operating under AS/NZS 2885, which ATCO is not, an operator may conduct a quantitative risk assessment (cost/benefit analysis) that would allow, in some circumstances, acceptance of a higher risk threshold. i.e. if it is proved that the current mitigation strategies were indeed ALARP or using the terminology - "Tolerable". In other words, any capital spent on lowering the risk of a loss of supply event would be disproportionate to the added gain. In contrast AS 4645 does not cater for this level of quantitative scrutiny. This information can be obtained by putting the 2 risk models side by side.
6) AS/NZS2885 applies to high pressure gas transmission pipelines. AS/NZS4645 applies to Gas Distribution Networks. It is not feasible to adopt the risk model of AS/NZS2885 to regulate networks that require compliance to AS/NZS4645.1 as the conditions under which these apply are vastly different.
7) In other words the wrong risk model has been used to arrive at this draft decision disallowing the ATCO proposed network reinforcement projects.
8) If ATCO would conform to the draft decision then they will be breaching the Gas Standards Act 1972 immediately when such access arrangement becomes effective. Because the risk of a loss of supply event is high to extreme, ATCO is then unquestionably obliged to mitigate to a lower, acceptable risk level. The Draft Decision in effect directs ATCO into non-compliance with AS/NZS 4645 and is considered untenable from a technical and safety regulatory point of view.

Given that this matter is not without its complexities, Energy*Safety* has provided some general and technical explanatory notes that may assist the you in assessing the issues raised further. The numbers in front of the notes are in relation to the numbered bullet points raised in this summary.

Explanatory Notes, general

Re 3) It could be argued that ATCO should have provided this analysis earlier at a time so that fewer customers would have been affected by such interruptions. However the timing of this would have been pre-safety case implementation and for various projects the timing could even go back to a period that was before the existence of this office, during SECWA's time. Given also that ATCO did identify and report the matter at their own initiative it would not be in the interest of the public to pursue any disciplinary action because addressing the issues surrounding potential interruptions are considered a priority by this office. Lastly if fewer customers are involved like the case was then, the potential hazard at that time would therefore not be considered catastrophic. The resulting risk would then not be a "high or extreme risk" and would not have needed addressing at that point in the past.

Re 4) There are extensive references to AS/NZS2885 risk considerations which led EnergySafety to conclude that this AS/NZS2885 model was used by the ERA and its consultant.

Re 6) AS/NZS4645.1:2008 relates to gas distribution networks that are by their very nature in densely populated areas, that are also under continued high levels of risks from third party interference and operate at pressure and flow scenarios that can be managed safely in a practical and cost effective manner. Therefore only a qualitative risk model has been adopted in AS/NZS4645.

Re 7) A quantitative risk assessment (QnRA) does not form part of AS/NZS4645 and a QnRA was used to justify the preclusion of these projects.

Explanatory Notes, technical

Re 1) For historical reasons that are too detailed to be discussed here, the primary cut-off point of ASNZS:4645.1 is 1050 kPa for distribution network pipes and gas mains. However in AS/NZS4645.1;2008 there is also Appendix A that is normative (compulsory) and permits the operation of steel gas distribution mains that are part of the gas distribution network and that also operate at pressures greater than 1,050 kPa.g, but less than 1,925 kPa.g which, is the maximum operating pressure permitted by a Class 150 rated pipeline or gas main. Although AS/NZS 4645 will be revised soon, there is no proposal to make any alterations to this area. Appendix A and its elevated MAOP envelop between 1050 and 1925 kPa applies to a number of jurisdictions such as Western Australia. The gas distribution mains referred to in Appendix A cannot be accommodated as transmission pipelines in AS/NZS2885 either hence the appendix A in AS/NZS4645. These gas distribution mains do not have pipeline licences and do not have the technical infrastructure normally associated with gas transmission pipelines and operate well below 30% of yield.

Re 2) A notifiable incident is defined in the Gas Standards (Gas Supply and System Safety) Regulations 2000 (GSR) as "an incident, event or other thing of which the Director requires notification under regulation 34." Looking through the lens of the Draft Decision in particular, para 451, EMCa states that, in its view, ATCO's adopted risk threshold of a catastrophic event of a loss of 25,000 to be "low by industry standards." Under the severity classes in AS/NZS 4645 Table C1, a supply catastrophic event is defined as a "long term interruption of supply." According to GSR reg 43(1)(c), Energy*Safety* considers a loss of a major customer exceeding 50 TJ/year or 100 other customers to be considered a notifiable incident. This is 250+ times less than the risk threshold mentioned by EMCa. Considering the urban sprawl in the WA metropolitan areas with critical customers dispersed within it, such as hospitals, NG

bus depots and schools, it is this office's view that ATCO's threshold of 25,000 is, if anything, too high contrary to the belief of EMCa.

Therefore, ATCO's assessment of a "catastrophic" loss of such supply event t around 25,000 customers is accepted by Energy*Safety*.

Re 4) The overall risk ranking is determined by considering the potential for the event as stated in AS 4645 Table C2. Plastics gas mains are inadvertently dug-up and damaged on a regular basis e.g. most recently an issue affected in excess of 700 customers which is classified "frequent". However, steel mains can also be damaged, the potential for this to occur is lower due to the strength of the material and the frequency of vehicle patrols inspecting the class 150 distribution pipelines for nearby construction activity, etc. A loss of supply event cannot be classified as "hypothetical" because it has been proven that a loss of supply event is indeed possible on steel mains. Referring to the Risk Ranking in AS 4645 Table C3, and considering a conservative frequency class between "unlikely" and "occasional", the risk matrix indicates that a catastrophic event becomes a "high" or "extreme" risk. According to Table C4, a risk ranking of "high" or more dictates that a gas distribution network operator such as ATCO, must reduce the risk rank to "Intermediate or lower… within a timescale of not more than a few weeks or even immediately." That timeframe is not practical but does provide an indication of the criticality of such matter.

The concept of ALARP (as low as responsibly practicable) is discussed both in AS 4645 and AS 2885 and have subtle differences due to the differences in pressures and other factors such as location factors. Location factors in AS/NZS4645 means they are all located near or in populated areas.
There are extensive references to AS/NZS2885 risk considerations which led EnergySafety to conclude that this model was used by the ERA and its consultant instead of the correct risk model of AS/NZS4645.

As mentioned above, Energy*Safety* was first alerted in 2013 to the magnitude of a loss of supply in some parts of the network; it was very concerned. Such a major omissions in the risk register in the current safety case may be considered a matter that is potentially the subject of disciplinary action by this office against ATCO. Although overdue in time, ATCO has in fact, identified the risk correctly. However, the ERAs Draft Decision has denied ATCO the chance to address this risk and essentially self-correct its error. This office will not in this instance pursue disciplinary action on the anticipation of a reversal of this decision by the ERA.

**Recommendation**

Energy*Safety* respectfully requests that the Economic Regulatory Authority reviews its decision making processes and consider reversing the current Draft Decision that prevents ATCO remedying the major predictable supply interruptions it has successfully identified and in doing so reinforce the gas distribution network.

If you wish to discuss these matters further please contact me.

regards

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