Angelica Austin

From: DEGROOT, Cornelis [redacted]
Sent: Tuesday, 9 July 2019 12:07 PM
To: ERA Info; Public Submissions
Subject: Comments on part of technical content of the draft decision of Access Arrangement for Period 2020-2024

Dear Sir

Building and Energy needs to respond to a number of statements made in the draft decision as they may be not be reflective of the practices it considers acceptable in the administration of the Gas Standards Act 1972 and it its regulations.

There are two extracts which have come to our attention:

444 EMCa noted that this was a conservative approach, as based on its experience the likelihood of shutting off the downstream system would vary with the location and size of the puncture, and other operational and repair methods would determine whether a complete shutdown was required. Also, EMCa noted that if a network must be shut down, positive network pressure could be maintained via other methods.

Building and Energy raises concerns about a number of the aspects of the statement made in this point.

a) *"as based on its experience the likelihood of shutting off the downstream system would vary with the location and size of the puncture"*

B&E's response: It is generally not acceptable to let high pressure (greater than 350kPa) gas escape in the metropolitan area during a repair. The only gas deemed acceptable to escape: is the amount that escapes during the time it would take to isolate the supply in the **shortest** possible time a satisfactory flow stop or isolation can be facilitated.

- For PE that is (usually because of the absence of isolation valves) to squeeze-off on both sides of the puncture if operating at less than 350kPa. Whereas for PE pipelines operating up to 700kPa, ATCO would be more likely to have isolation valves installed that could be used to achieve prompt isolation of the downstream connected networks, and;

- PVC operates up to 70 kPa and is not considered high pressure. PVC is isolated via flow stopping either side of the damaged or leaking area, and;

- For High Pressure Steel pipelines, operating above 350 kPa (because it takes a considerable amount of time to weld stopple–off fittings on steel and to employ that gear) section isolation valves are normally installed. Although steel pipes can generally be isolated quicker than affecting a flow stop on plastic; their higher operating pressure and distance between valves often means that the amount of gas that would escape remains the greatest. Whilst punctures in plastics happen a number of times per month, punctures in steel are rare occurrences.

Puncture of and a major discharge from a high pressure steel pipeline would be an emergency under the control of emergency management agencies and ATCO would be bound to abide by the emergency controllers, emergency response and control directions. It is B&E's considered view that emergency service agencies, would not allow a major discharge from a high pressure steel pipeline to continue for any significant time within the metropolitan or built-up areas, beyond what would be considered sufficient time to isolate gas supply to make the area safe. B&E also considers it unlikely ATCO would not abide by such directions and if the technical advice of B&E was sought, B&E's advice would be that it was necessary to isolate supply to make the areas safe. Therefore if ATCO was to ignore such directions, it would be in contravention of the Emergency Management

Act 2005, the Gas Standards Act 1972 and ATCO's own Safety Case. ATCO ignoring such directions would result in likely prosecution by multiple WA Government Agencies including B&E. From our experience with ATCO they are unlikely to pursue this also because such actions would violate their obligations under the licence it holds to distribute gas.

Therefore B&E is not sure in which jurisdiction EMCa has gained the experience it had quoted, but B&E is not aware this has ever happened in Western Australia. B&E cannot support any tolerable ongoing gas escape for the sake of maintaining supply of the significance being indicated. The only gas escape that B&E would tolerate is the (miniscule) blow-by from the first squeeze-off or bagging-off that is vented between the first and second flow-stop. Safety in the metropolitan area is of such significance that it is also not acceptable to construct a bypass whilst the gas is blowing off, therefore the flow is first stopped and then a bypass is constructed, even if that means a loss of supply.

Furthermore if a bypass was to be constructed whilst such major discharge was occurring crews must lay this bypass at a considerable distance. Radiation contours would quickly suggest that 100 meters in any direction is a minimum. It then follows that the construction of such bypass will involve significant logistics and welding of dozens of joints apart of welding on the tapping Tee's. Taking this all into account B&E cannot support EMCa's suggestion that a bypass on such infrastructure installed under those conditions has in fact been done in built-up areas in WA.

Finally with the use of PE and distributing gas at pressures higher than 70 kPa, self-ignition due to static electricity has become more common experience during prolonged gas escapes than in the past. The higher the flow, the longer it takes to interrupt the flow of escaping gas it means the higher the probability is that self-ignition will occur. As a yard stick 30-60 minutes is about the time after which self-ignition can be expected to occur. Constructing a bypass whilst a raging fire is occurring is also not considered viable.

b) *"EMCa noted that if a network must be shut down, positive network pressure could be maintained via other methods."* B&E would agree with this generic statement when the gas supplies to those networks are backgassed (gas can flow in both directions). For example a gas network that is not connected to other networks and is only supplied from one source will likely suffer a loss of supply if a puncture occurs on the (only) pipeline supplying that network. Because line-pack in networks is usually small (minutes and not days) it also means that the pressure will reduce to very low levels very quickly meaning that air may enter the networks pipes both the site of the escape/puncture and by customers attempting to continue to use their appliances. One such example of a loss of supply (from a pipeline integrity failure) is: https://www.abc.net.au/news/2015-04-16/gas-restored-to-some-homes-following-pipeline-breach/6399068. This affected approximately 10,000 customers. In WA there are various parts of ATCO's network sensitive to such scenario of supply interruptions of networks impacting greater than 30,000 customers, for example Bunbury/Busselton and Northern metropolitan Perth (anything connected downstream of Hester Avenue, Neerabup.

c) *"EMCa noted that if a network must be shut down, positive network pressure could be maintained via other methods."* B&E acknowledges that another source of gas in the case of an interruption of the (often steel pipe) gas supply to a network, is potentially through the interconnection of the downstream plastics networks. ATCO's primary mechanism for ensuring adequate capacity and security of supply is via high pressure steel pipelines. Local area security of supply is maintained via configuration of network regulating facilities and mains (predominantly plastic) to achieve an appropriate level of back gassing. ATCO's downstream networks are predominantly PVC which has a maximum operating pressure of 70 kPa, therefore the network hydraulics will not support back gassing of large areas.

Since relaying the old networks is financially not viable (because their design life has not been expended as yet) and one could not continue with using older technologies; the gas supplies cannot be maintained through interconnections that cannot exist. Therefore B&E is not sure how EMCa came to form this opinion as it cannot identify alternative suitable mechanisms for maintaining security of supply in these critical networks.

445. *EMCa considered that ATCO should include a fifth risk reduction factor to account for the likelihood that no isolation was required, as EMCa was not aware of an instance where network isolation following a puncture was required anywhere in Australia.* Punctures do occur and it is understood that a significant part of the Sydney CBD network went down due to a puncture made in a steel pipe. This matter was discussed in the December 2018 meeting of the committee for AS/NZS4645.1. https://www.abc.net.au/news/2018-07-08/cbd-reopens-after-gas-leak/9955254

Regards

Cornelis de Groot | Principal Engineer Gas Supply
Building and Energy Division

Department of Mines, Industry Regulation and Safety
303 Sevenoaks Street Cannington WA 6107
Tel: [redacted]
[redacted] **www.dmirs.wa.gov.au**

Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

We're working for Western Australia.

We acknowledge Aboriginal and Torres Strait Islander people as the Traditional Custodians of this land on which we deliver our services. We pay our respects to elders and leaders past, present and emerging.