ICL INQUIRY STATEMENT

Alistair Gunn

1. I run my own risk management consultancy, mainly in the oil and gas sector.

2. I am asked about my employment with the Health and Safety Executive ("HSE") which lasted from March 1977 to December 1985.

3. Prior to joining HSE I attended the University of Glasgow and obtained a BSc in Chemistry. I then did a PhD in Organic Chemistry followed by three years of post doctoral studies in Canada and Liverpool.

4. From 1973 to 1977 I worked in the Ministry of Defence Royal Ordnance Factory manufacturing propellants and chemical intermediates and in March 1977 I was recruited into the HSE as a specialist inspector.

5. As a specialist inspector and because of my qualifications and previous experience I didn't go through the same training as those recruited as general inspectors. I spent one year as a general Factory Inspector learning the ropes both legally and administratively i.e. the working arrangements of the HSE.

6. My specialism was as a chemical inspector, fire and explosion.

Knowledge of LPG

7. Prior to entering HSE I had no particular knowledge of LPG. Within HSE you learn on the job. In the Edinburgh Field Consulting Group (FCG) I initially worked with a senior chemical inspector, my immediate boss Ken Moss and an experienced main grade fire and

explosion inspector and attended internal courses, meetings and conferences to exchange views and would have learned about LPG that way.

8. I don't remember having attended any courses specific to LPG.

9. We also had a headquarters body called FI8 (Fire Explosion) with headquarter specialists with their own more narrow specialisms including topics such as LPG. I would say that I learned about LPG from my senior experienced colleagues.

Request for specialist support

10. I would have got involved at ICL/Stockline as a result of a request from the front line inspector, perhaps an inspector doing a visit where they saw an issue that they were not comfortable dealing with and that they felt needed specialist support.

11. In this case the document requesting advice form the FCG is dated 9 November 1981 and 23 November 1981 **[ICL/ 0011093]** signed by Sue Johnston, Inspector and also by the Principal Inspector.

12. I have no recollection of receiving this document. There is also a document described as "Part 2" which has been signed by my boss at the time, Ken Moss. This document records the receipt of the request for specialist assistance, acceptance of that request and determination of the priority (in this case the allocated priority being one month). The one month target is to at least give a response to the inspector who had requested it within that period.

13. The job would be allocated to me by Ken Moss probably taking into account my availability, workload and so on.

Visit to ICL [ICL/11420-11422]

14. I can vaguely remember the site. I am pretty sure I did not go into the building. I can't remember who I spoke to and I don't remember any of the conversations. Although Sue Johnston's name rings a bell with me I can't picture her or the visit at all.

15. When I attended at the site I would have had the request form from Sue Johnston with me. It was my almost invariable practice also to have relevant codes of practice and guidance with me and I think it highly probable that I would have had the then current LPG ITA Code of Practice (which I remember was an A5 orange booklet) and the HSE's then current guidance CS(5) **[ICL/001168- 001187].** I did tend to use the industry standards more than the HSE guidance. I would say that the industry guidance was more generally referred to than the HSE guidance. When discussing the requirements of the codes and guidance my practice would have been to have shown relevant requirements to the duty holder when discussing what I was going to be recommending to him.

Scope of request for assistance

16. I consider that the request for specialist assistance was to advise on the hazard arising form the bulk installation. It was not part of the technical scope of my request to look at the underground pipe. I can confirm I was aware of FIC 286/43 **[ICL/01040- 01043]**. I was also aware prior to my visit of the risks associated with corrosion of the underground pipes and the collection of leaked LPG into voids, trenches, basements and so on from underground pipes. I remember at conferences in the early 80s hearing an anecdote from a colleague of LPG tracking underground for up to half a kilometre and collecting in the cellar of a pub. It was a well known hazard. I can't remember whether that particular anecdote came to my attention before or after my visit to ICL. At my visit the whole issue was around the question

of separation distances relating to the bulk storage tank. The distances present on the site were not in compliance with the code. The hazard on the site came from the fact that there were two tonnes of LPG on site. That was the scope of the request. I was not looking at what happened once the propane went into the building. As far as my visit was concerned the question of where the gas went from the tank never came up. The vapour off take pipe was not the subject of conversation or consideration.

17. I don't have any clear recollection of my visit. If I hadn't read my report **[ICL/011089]** I would be really struggling to give any detail at all about the visit and it is difficult for me to expand on the report in a meaningful way.

18. Before discussing my report I want to expand on what separation distances are and the reason behind having them. There are a number of reasons;

19. If an incident occurred at a bulk storage tank, in particular a leak, the greater distance between the tank and a potential ignition source gives greater opportunity for the gas to disperse and for any flammable concentration to diminish.

20. Equally if there is leakage at the vessel that caught fire the further away the building was from the tank the less the risk that someone will be harmed by a flammable event at the tank or that the event could escalate.

21. This was a tricky site and it is 90% certain that I would have discussed this with my boss, Ken Moss, who was very experienced. I did bounce tricky or complicated problems off him.

22. My report contains five numbered paragraphs with paragraph five containing my recommendations.

23. From the first paragraph it is clear from that that I had quite a strong reaction to the presence of the tank at this site. It was very close to the surrounding walls and fences and the separation distances were very much less than ideal. You will see that I have noted that it was only 150mm from the fence separating the factory from an adjacent business over whose activities ICL would have no control.

24. In paragraph 2 of my report I make reference to the fact that there were drains in the vicinity. I am highlighting that because of the danger that LPG, being significantly heavier than air can track down and accumulate in areas such as drains. I accepted at face value Mr Stott's assertion that propane was essential to the process as natural gas would lead to deposits on the work pieces.

25. In paragraph 3 I see that I indicated I would contact Calor Ltd to express my disapproval about a suggestion from Calor that the inventory at site be increased. My objection to that proposal was that the 2 tonne tank was already in a bad location and more inventory on the site was not a good idea. It also seems as if I had been told by Mr Stott and therefore reminded Calor that the gas delivery vehicle should not enter the factory yard. The reason for that was that a road tanker full of gas would increase, albeit temporarily, the inventory on this cramped site.

26. Turing to paragraph 4 I note there that I state the installation could be brought up to an acceptable standard (I repeat the reference "acceptable installation" in my summary sheet). What I meant by that was that in my judgement, looking at CS(5) and industry guidance then, provided the other steps I recommended were implemented, in particular the extended radiation wall and the water drench system, overall the package of measures would provide an acceptable

situation although not in strict compliance with the code. I should say that although I have said "removal of the tank may be recommended" I think, looking at the whole context, that I must have meant relocation rather than removal.

27. I considered a change from one x two tonne tank to two x one tonne tanks (from memory that a one tonne tank would have a smaller separation distance than a two tonne tank, hence being closer to compliance with the code) but I didn't think it would render a safer situation. I think my reasoning for that would probably be that you then had two tanks to fill, more pipe work, more connections and so on and you weren't really achieving any particular increase in the overall safety of the site. I recommended constructing a wall along the boundary with the neighbouring site (which boundary, it seems, had a fence at the time) However I needed to be satisfied that the fire brigade were happy with this wall (i.e. that it did not prevent access and water coverage of the tank unduly) and I had a subsequent meeting at the site with Ms Johnston and Station Officer Simpkins. I don't remember my discussions but an educated guess is that the water drench system (recommendation 5.2) might have been the outcome of my discussions with the fire brigade.

28. Turning now to my recommendations, 5.1 was to replace a fence between ICL and the adjoining premises. The reason for that was that there was an existing fence which really was no barrier to preventing a gas leak permeating onto other premises where ICL had no control over their activities and in particular ignition sources. I recognised that that wall would affect ventilation. However, I felt that looking at the overall options there was certain benefit of increasing the separation distance (the distance which the gas would have to travel before reaching a potential ignition source) i.e. by making it travel around the wall before reaching a potential ignition source or other building.

29. At 5.2 I recommended fitting a fixed water drench or deluge system. Such a system was unusual in a tank of this size. Larger tanks would almost always have such a system but for a tank of this size it was unusual. The reason I recommended it, possibly after discussion with the fire brigade, is that you would want to prevent the tank form overheating if it was exposed to radiant heat perhaps from a fire in a neighbouring factory. I was recognising with this recommendation that the separation distances were not ideal and supplementing with that drench system.

30. Recommendation 5.3 suggests that the tanker had been entering the yard during delivery. This is a critical time with increased likelihood of LPG releases and it is important that it be done under the supervision of someone who knows what steps to take should an emergency arise.

31. Recommendation 5.4 was to deal with the risk of static being generated by the tanker and causing an ignition source during the transfer operation.

32. Recommendation 5.5 is good practice in the control of ignition sources.

33. Recommendation 5.6 is equally good practice and this recommendation would suggest that those extinguishers were not present on my visit.

34. As far as recommendation 5.7 is concerned I can't say if this was simply reinforcing what Sue Johnston had told the duty holder on her visit (because she makes reference in her request for specialist assistance to accumulation of material around the tank) or whether there was an actual shortcoming like that on the day I visited. It could be either.

35. Recommendation 5.8 simply reflected that security cover was not locked on the day.

36. Recommendation 5.9 was a reflection of the age of the tank with a requirement to make sure it was checked.

37. Recommendation 5.10 was to convey that to the extent that matters other than recommendations 5.1- 5.9 were covered in CS(5) it was up to the duty holder to ensure that he was complying with that.

38. The drench system was to guard against the possibility of the tank losing its integrity when it was subjected to the heat. Steel loses 50% of its strength at temperatures in excess of 1000 degrees C. It was possible the tank could rupture if it got too hot.

39. Once I had been on the second visit I evaluated the information that had been given, considered matters and almost certainly discussed it with my boss who would have reviewed my report and sent a copy to Sue Johnston and a copy would go on the file. There would be no other follow up unless I asked for some. The inspector would communicate my findings to the duty holder and follow up to ensure it happened.

40. I was asked whether I considered the underground pipe as a matter of concern. I did not as it did not appear to have any apparent construction, support or maintenance failing and also was outside the scope of my visit.

41. I was asked why I did not make recommendations with a view to checking the integrity of the underground pipes. That was not part of the scope of my remit. My remit was to consider the hazards from bulk storage of LPG on this cramped site. I had no reason to doubt the line integrity.

42. I was asked in general terms if I was aware of the need to consider the risk of corroded underground pipe work. In general terms yes although that was not a specific consideration for me at this site. The HSE frequently initiated inspection programmes or targets focussing on issues that may have recently come to light following events or incidents that had occurred. I was not aware of any enhanced inspection initiatives at that time for underground LPG pipelines. Consequently I would not have automatically gone beyond my scope regarding the LPG bulk storage unless this was the case or I had reason to doubt the line integrity.

43. I was asked whether, in general terms, I was aware of the need to consider the risk of the entry of LPG pipe work into unventilated voids such as basements. Again I would agree that in general terms I was aware of that although I was unaware of the presence of the LPG pipe work going into this building at basement level. I wasn't there to look at the pipe work. There are hazards from LPG from delivery to the tank, storage at the tank, conveyance form the tank to the user points and also at the user processes appliances. I wasn't there to consider all those hazards, simply the bulk storage. It wasn't the scope of my remit to consider the use of LPG in the premises or the transfer from the tank.

44. I was asked whether I was aware in general terms of the need to consider the risk of pipe work entries into the buildings not being properly sealed. As I do not understand the question and the context in terms of potential risk reduction I must assume I am unaware of the specific requirements being referred to.

I confirm that the contents of this statement are true.

Witness signature _____

Date _____