

ICL INQUIRY
PHASE ONE
SUBMISSIONS

on behalf of
THE FAMILIES AND SURVIVORS
represented by
PATRICK McGUIRE, THOMSONS,
SOLICITORS

A. Introduction

- [1] Findings in fact on behalf of these Core Participants are proposed in order to provide a factual context. The first section of this document summarises the proposed findings in fact. For presentation purposes the findings in fact are subsumed under different heads.
- [2] The ICL entities are referred to as "ICL". The tank suppliers are referred to as "Calor" and "J Gas". The Health and Safety Executive is referred to as the HSE.
- [3] No findings are proposed in connection with the suitability of the premises as a source of LPG because of the extent of the evidence in Phase 1. Although the emphasis in Phase 1 necessarily has been on the explosion and its cause, the majority of the deaths and all of the injuries sustained were caused by structural failure. Kenneth Murray and Andrew Galloway may have been victims of the direct consequences of the ignition of the explosion mixture but the other deceased victims and injured persons sustained their injuries because the structure was unable to sustain the explosion forces generated in the explosion.

B. Summary

- [4] Although a number of factors conspired to cause the disaster there are two primary reasons why it happened.
- [5] Firstly, there was the failure to inspect the pipe in 1988 in response to the HSE recommendation for partial excavation. Had that recommendation been followed through the absence of anti-corrosion protection would have been discovered.
- [6] The HSE ought not to have allowed itself to be deflected from pursuing the excavation recommendation.
- [7] In persuading the HSE to accept an alternative to excavation, ICL was simply pursuing its policy of avoiding implementing HSE recommendations.
- [8] Secondly, a competent risk assessment ought to have been carried out by ICL in relation to the whole LPG system by January 1993.
- [9] Such a risk assessment would have identified the potential hazards associated with buried pipework.
- [10] The result of a competent risk assessment would have been the inspection of the pipework to assess its integrity.
- [11] In the course of such an inspection the absence of anti-corrosion protection would have been evident, and the pipework then replaced.

C. Findings in Fact

The explosion and its cause

- [12] A leak of propane vapour from the buried pipework in the yard adjacent to the south wall of the basement found a path into the basement.
- [13] The basement area was poorly ventilated. Propane vapour accumulated in the basement area and formed a flammable gas/ air mixture. The flammable cloud found a source of ignition.
- [14] The explosion occurred at approximately mid day on 11th May 2004 at about the time Kenneth Murray entered the basement area.
- [15] The basement ceiling/dispatch area floor was forced upwards by the forces generated by the explosive overpressure.
- [16] The total collapse of the west end of the building was caused by the explosion as it vented into the ground floor area.
- [17] The leak of propane vapour came from a fracture crack to the inside of the elbow of the pipework adjacent to the basement.
- [18] The buried pipework adjacent to the basement was badly corroded. A concrete block had been placed on the elbow of the LPG pipework in the area of the fracture.
- [19] The fracturing of the pipe was caused by a combination of mechanical load and corrosion.

LPG installation

- [20] A 4,000 litre LPG tank was supplied to ICL by Calor in 1969. The LPG pipework was installed on behalf of ICL by persons unknown but under the supervision of Frank Semple of Grieban Plant.

- [21] At the time of the installation of the LPG tank the pipework responsible for the leak that led to the explosion was uncovered.
- [22] The pipework, including the pipework adjacent to the basement, was not protected against corrosion by the use of materials such as denzo tape.
- [23] The yard to the south of the building was raised in about 1973. The Building Warrant Application dated 4th January 1973 (ICL/011175) for the work to the yard was signed by C H Downie. As a result of the raising of the level of the yard the pipework adjacent to the basement area was covered over. The materials used to do so were not appropriate because they compromised the integrity of the pipework.
- [24] On 17th June 1991 two 2,000 litre tanks were installed by Calor to replace the existing 4,000 litre tank.
- [25] On 19th March 1998 a 2,000 LPG tank was delivered by J Gas and installed on their behalf on 25th/26th March 1998. That tank was replaced by J Gas in November 1998.
- [26] The tanks installed on behalf of J Gas were connected to the existing pipework. Pressure tests were carried out on behalf of J Gas.
- [27] The pressure tests carried out on behalf of J Gas were carried out at system pressure and designed to check the integrity of the pipe connections.
- [28] Annual pressure tests were carried out by J Gas on 8th August 2001, 10th June 2002, 9th June 2003. On 8th April 2002 the first stage regulator was replaced. The system was pressure tested at that time. All pressure tests were at system pressure.
- [29] In accordance with standard industry practice for commercial premises, the responsibility of Calor or J Gas extended only to the tank and associated pipework up to the first stage regulator.
- [30] A pressure test at system pressure/soundness test establishes that there is no leak in the system at the time of the test.

The Role of the HSE

- [31] The HSE first visited the ICL premises on 16.4.70. Following upon a visit on 22.8.73 the HSE concluded that Mr Downie did not take a responsible attitude especially towards fire risks.
- [32] Thereafter in 1975 and 1976 a number of HSE visits took place. A number of Improvement Notices and Prohibition Notices were served during that period. By 17th September 1976 the HSE was reasonably satisfied with ICL responses to the Improvement Notices.
- [33] The HSE visited the premises on 11th June 1981. During that visit the existence of the LPG tank was noted and, apart from advising ICL to refrain from storing materials too close to the tank, no other action was proposed.
- [34] During a visit by the HSE on 10th October 1981 it was noted that the yard was cramped and the separation distances between the tank and the boundary walls did not comply with the appropriate standards.
- [35] Following visits by the HSE on 20th January 1982 and 2nd February 1982, by letter dated 2nd March 1982, the HSE made a number of recommendations in connection with the LPG system. Those recommendations were made with input from Dr P A Gunn, an HM Chemical Inspector.
- [36] One of the recommendations made at that time was that a fixed water drench system should be fitted by the tank.
- [37] A visit was made by the HSE in December 1982 (Mr Wilcock). Following that visit, by letter dated 20th December 1982 Mr Stott on behalf of ICL wrote to the HSE. In that letter Mr Stott responded to a number of the recommendations made by the HSE in their letter of 2nd March 1982. In particular he said that a water drench system was to be installed over the Christmas break. He also indicated that the LPG tank had been replaced within the last 18 months.

- [38] Prior to his letter of 20th December 1982 Mr Stott had telephoned Mr Wilcock and told him that ICL had completed "*all the items with regard to the LPG storage excluding the drench system which has been delivered but not yet installed*". He also told Mr Wilcock that the drench system was to be installed during the Christmas shut down period.
- [39] As at December 1982 the HSE concluded that no further action was proposed in connection with the ICL LPG system.
- [40] The HSE again visited the premises in November 1985. Following the visit Mr Stott wrote to the HSE in January 1986 indicating that the items brought to ICL's attention during that visit had either received or were receiving attention. At that time the HSE had planned a check visit of the premises and in particular the LPG system for May 1986. That check visit was not carried out.
- [41] The HSE visited the ICL premises on 7th April 1988. Following the visit, by letter dated 11th April 1988, the HSE informed ICL that it intended to arrange for another specialist to look at the installation and that some of the recommendations made on 2nd March 1982 and in particular the installation of the fixed water drench system had not been implemented.
- [42] Following HSE visits on 7th and 9th August 1988 a report dated August 1988 by Mr Tyldesley made a number of recommendations. One of these recommendations was that part of the underground LPG pipework should be excavated and the state of the pipework and any corrosion protective coating examined by a competent person.
- [43] By letter dated 8th September 1988 to ICL the HSE set out its recommendations to bring "*the storage of LPG within the current standards*". Recommendation 11 repeated the recommendation made by Mr Tyldesley that part of the underground LPG pipework be excavated.
- [44] On 11th September 1988 a meeting took place at the ICL premises between the HSE and Mr Stott of ICL. The purpose of that meeting was to discuss the

recommendations contained in Mr Tyldesley's report. At the outset of that meeting Mr Stott announced that the LPG oven was to be transferred to mains gas.

- [45] ICL sought the assistance of Calor in order to deal with the recommendations made by the HSE in its letter of 8th September 1988.
- [46] By letter dated 4th January 1989 from Calor (Mr Coville) to the HSE, Calor made a number of proposals in response the HSE recommendations. The recommendation to excavate was countered by a proposal that *"the condition of the attendant vapour - offtake pipe would be ascertained, during vessel - exchange, by examination of the "riser-pipe", at the vessel, and by a pressure-test on the pipeline"*.
- [47] Mr Tyldesley was asked to consider the proposals put forward by Calor Gas. By memo signed by him on 17th January 1989 he indicated that *"if the occupier can somehow gain control of extra land outside his existing premises, so that he has full control over all land within 3 metres of the proposed tank, then these proposals are acceptable. If this condition cannot be met, then I stand by my earlier recommendations and would be prepared to support enforcement action in respect of them. In respect of Recommendation 11 regarding examination of the underground pipework from the installation, then the proposals by Mr Coville are acceptable"*.
- [48] By letter dated 23rd January 1989 from the HSE to Calor the HSE indicated that the proposal *"is only acceptable provided the occupier can somehow gain control of extra land outside his existing premises ..."*
- [49] On 5th January 1989 Mr Stott wrote to the HSE and said that he could *"now confirm that we are in fact in control of land outwith our main factory gate ..."*
- [50] The HSE did not visit the premises after its visit of 11th September 1988 until 9th January 1992.
- [51] In the period from its first visit in 1970 to 11th September 1988 the HSE made over forty visits to the ICL premises.

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- [52] In its dealings with the HSE, ICL pursued a policy of evading its responsibilities towards health and safety. The policy was at management level.
- [53] In his letter of 20th December 1982 Mr Stott misled the HSE in relation to the installation of the water drench system. He also misled the HSE in suggesting that the LPG tank had been replaced within the last 18 months.
- [54] In 1988/1989 when the recommendation for excavation of part of the LPG pipework was made and responded to, Mr Stott misled the HSE in his letter of 25th January 1989 in asserting that ICL were "in control of the land outwith" the main factory gate. That was not correct in fact.
- [55] The Calor proposals in response to the HSE recommendations of 8th September 1988 included additional ventilation being provided at the wall adjacent to the factory gate by the staggered removal of wall bricks at floor level. That proposal was not implemented. In his letter of 12th January 1989 to the HSE, Mr Stott indicated that there was "*no reason why we should not remove bricks from the wall*". That was never done. He misled the HSE.
- [56] ICL made proposals in order to avoid following the HSE recommendations without any serious intention of implementing these proposals. This approach to health and safety is reflected in the memorandum from Mr Stott to Mr Downie dated 18th August 1988 that "*We have reached the end of the road in side stepping their requests (since 1982) ...*"
- [57] From 1st January 1993 ICL was obliged to comply with the provisions of the Management of Health and Safety at Work Regulations 1992 ("the 1992 Regulations") and the associated code of practice. Under the 1992 Regulations ICL was under a duty to make a suitable and sufficient risk assessment. No risk assessment was undertaken until Andrew Stott did so in 1997.

- [58] The risk assessment dated October 2001 was inadequate in that it did not identify the full extent of the risks associated with the LPG system. No expert input was obtained in connection with the preparation of the risk assessment.
- [59] Mr Downie was in full control of ICL at the time of the proposed pipework excavation. He was aware of the HSE recommendations.

D. Prevention

[60] This section of the submission deals with how the disaster could have been prevented.

Gas Suppliers

[61] The explosion could have been prevented if the LPG suppliers had been aware of the condition of ICL's pipework and had not supplied gas in those circumstances.

[62] Gas suppliers are involved in supplying large quantities of highly explosive LPG. They obtain a commercial benefit in doing so. They are the experts in the field. This disaster has disclosed that there is a lack of skilled input by the LPG suppliers when dealing with a customer like ICL. The LPG supplier is in possession of information about the danger of LPG that a customer such as ICL would not have. Calor knew or ought to have known about the Daventry explosion in 1987.

[63] The explosion could have been prevented if the LPG suppliers had used the information available to them and their expertise by assessing the integrity of the LPG system.

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[64] The explosion could have been prevented by ICL if the following had occurred:

- a) The pipework had been properly maintained;
- b) The pipework had had a proper system of inspection;
- c) A risk assessment had been (1) carried out by an appropriate person (someone who was properly trained in the assessment of risks and the preparation of risk assessments) ; (2) the risk presented had been identified and (3) the pipework had been excavated;
- d) The location of the pipework had not involved it (1) being underground (2) passing into a basement area;
- e) The basement had not been formed (or the risks presented by the basement area had been properly assessed and addressed); and

- f) ICL had not adopted a policy of avoiding the implementation of HSE recommendations.

HSE

- [65] The explosion could have been prevented if the HSE had insisted upon its recommendation that the pipework be partly excavated.
- [66] It is clear from the evidence that, with the exception of Mr Tyldesley, the HSE did not focus on the buried pipework in their dealings with ICL from 1970 onwards. Nor did the HSE focus on the presence of LPG pipework in a poorly ventilated area such as the basement at the premises. The HSE was in a position to have the relevant knowledge as to the risks associated with buried pipework and the presence of pipework in poorly ventilated areas. The disaster could have been prevented if the HSE had provided clear advice to ICL as to the inspection and use of buried LPG pipework and taken steps to recommend that the pipework should not remain in a poorly ventilated area.
- [67] Having regard to ICL's poor history in relation to health and safety matters, and in particular in relation to the siting of the LPG tank, had the HSE taken a more proactive approach in their dealings with ICL the accident could have been prevented. ICL would have been made aware that they could not readily ignore recommendations made in connection with health and safety and in particular the LPG system.

E. Preventive Measures/Oversight Regime

- [68] This section of the submission addresses the preventative measures/oversight regime that may be appropriate and suitable.

Gas Suppliers

- [69] Gas suppliers should have a duty to ascertain the safe condition of an entire system of pipework before installing an LPG tank.
- [70] Where there is no appropriate evidence verifying the age and condition of pipework then an appropriate excavation of the pipework should be carried out.
- [71] A soundness test of a system at system pressure by itself should not be accepted as sufficient evidence of the soundness of a system without additional evidence concerning the age of the pipe, the material it is made from and the state and extent of any corrosion protection.
- [72] It should still be the owners' responsibility to provide adequate documentation or other evidence to prove this. Gas suppliers should insist on this documentation being exhibited to them before supplying LPG.

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- [73] The evidence suggests that health and safety was given a low priority at ICL. Where small/medium-sized companies have explosive substances such as LPG on site their health and safety regime should be subject to rigorous scrutiny. Such companies should be required to provide written independent evidence of the state of any pipework carrying LPG including the date of installation, what it is made of and the state of its corrosion protection. They should be required to provide details of an appropriate inspection regime.
- [74] In the event that such written records are not made available by a company then, prior to receiving LPG, they should be required to excavate the pipework in order to

provide evidence that it is in a safe condition. In the event that they are unable to do so (or refuse in doing so), they should be prohibited from receiving LPG.

[75] Companies such as ICL should be fully aware of their responsibilities for equipment within their ownership. Although the buried pipework was owned by ICL, it is clear that over the years ICL failed to keep sight of that fact. There has to be absolute clarity between gas suppliers and their customers as to the extent of their respective responsibilities.

[76] Risk assessments of LPG systems must be carried out by a competent person. Companies like ICL should be compelled to produce evidence that the risk assessment has been carried out by someone who is properly trained.

HSE

[77] The general failure of the HSE to properly focus on the risk created by the buried pipework notwithstanding the number of visits made to the ICL premises suggests that there was a lack of competence within the inspectorate in relation to the risks associated with a LPG system. That suggests that there is a need for proper training of HSE inspectors as to the risks associated with LPG systems. The fact that the buried pipework had been *in situ* for many years and in need of inspection should have been obvious to a competent inspector. Similarly the fact that the pipework entered a poorly ventilated area should have been obvious.

[78] The transmission of information in relation to the risks associated with buried pipework within the HSE was shown to be inadequate. The report into the Daventry explosion (ICL/011510) was available as at January 1988 but was not widely known within the HSE. The HSE should have in place robust systems for ensuring that such information is circulated to its inspectors and particularly those who are directly involved in the inspection of LPG systems.

[79] In their dealings with ICL the HSE failed to carry out proposed check visits. This was a clear systems failure. The HSE systems should be sufficiently robust so as to ensure that proposed inspections to check whether or not recommendations have been put in

place are carried out. The HSE's failure in this case allowed ICL and in particular Mr Stott and Mr Downie to avoid putting into place recommendations designed to improve health and safety at the premises.

- [80] In inspecting premises such as the ICL premises the HSE ought to have regard to the suitability of the premises in relation to the use of LPG. Once the risk of an explosion is recognised it becomes important to consider what the impact of an explosion may have on the structure of premises. The HSE inspectorate should be trained to have regard to the structure of premises when considering the potential effects of an explosion.

F. Conclusion

Phase One of the Inquiry has provided the relatives of the deceased and the survivors who have attended the proceedings or visited the website with a clear insight into why this disaster occurred. This submission is designed to reflect their views and their desire that the kind of lessons proposed in the submission can be learned.

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