



RESPONSE BY HEXCEL COMPOSITES LIMITED

TO THE DRAFT REPORT OF DR ALUN JAMES

DATED 12TH NOVEMBER 2008

Hexcel Composites Limited

8th April 2009

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1.0 Introduction and Background

- 1.1 Hexcel Composites Ltd (Hexcel) submitted to South Cambridgeshire District Council (SCDC) an application for outline planning permission for the development of a Carbon Fibre Precursor plant (Application No S/1749/06/O) in September 2006 and an application for Hazardous Substances Consent (Application No S/1703/06/HSC) in August 2006 on land at Ickleton Road, Duxford, Cambridgeshire. The proposed development, adjacent to HEXCEL's existing operations, would create some 80-100 new jobs. The applications were ultimately reported to the Planning Committee of SCDC in January 2008, where it was recommended that consents should be granted. As part of the consultation process, the Health and Safety Executive (HSE) was consulted by SCDC in respect of the risk and safety aspects of the two applications. HSE is the statutory agency responsible for the protection of people against risks to health or safety arising out of work activities. The formal position of HSE in respect of the outline planning application was that *'HSE does not advise, on safety grounds, against the granting of planning permission in this case'* and in respect of the Hazardous Substances Consent Application that *'there are no significant reasons, on safety grounds, for refusing Hazardous Substances Consent.'*
- 1.2 On 14 November 2008 a draft report entitled *'Predicted effect of accidental spillage of Acrylonitrile from Hexcel plant'*, prepared by Dr Alun James, was sent, by Clare Delderfield, a resident of Duxford, to the Chief Executive at SCDC. The draft report (referred to below as the 'James report') focuses on three scenarios in relation to the transfer, transportation, and operational emission of Acrylonitrile which is a key component of the CFP process. In summary, the James report concluded that *'In the scenarios described, the risks to the local population appear to have been significantly underestimated by the HSE report supporting Hexcel's planning application.'* and recommended that *'a review of reports (be) undertaken to determine the reasons for these significant differences.'* The James report is, in essence, an alternative interpretation of certain of the matters assessed by the HSE in their internal assessment of the proposed development.
- 1.3 This response sets out the formal observations of HEXCEL on the James report, and considers:
- (a) Factual matters relating to the HSE assessment and the James report;
 - (b) For each of the three scenarios assessed in the James report, whether the individual events are realistic; whether the assessment of each scenario describes, fairly and objectively, the likely consequences; and whether the conclusions reached in the James report could, or should, be preferred to those reached by HSE.

- 1.4 It is important to bear in mind that :
- (i) HSE is a statutory government agency. It is independent and impartial.
 - (ii) SCDC needs to consider whether the proposed storage and use of Acrylonitrile is appropriate in this location, having regard to the risks arising to persons in the surrounding area and to the environment. To this end, SCDC is required to consult statutory bodies, including the HSE and the Environment Agency (EA), before making a decision on any application for consent.
 - (iii) Whilst local authorities are not required to follow the advice of the HSE, they are exhorted (for example at Annex 1 of Planning Policy Statement (PPS) 23 'Planning and Pollution Control') that they '..should rely on the advice of pollution control authorities and the HSE, in relation to sites requiring hazardous substance consent'. (Emphasis added)

2.0 Factual Matters

- 2.1 The description of the proposed development, as set out in the James report at para 1.1 is agreed, save that it is incorrect to describe the proposed development as an '*acrylonitrile processing plant*'. The planning application is for a Carbon Fibre Precursor ("CFP") plant. Paragraph 1.1 of the James report erroneously describes '*a previous report...commissioned by Hexcel*'. The cross reference (James reference [1]) is to the HSE's assessment of the Hexcel application, released to Andrew Lansley MP on 30 April 2007. HSE's assessment is wholly independent of HEXCEL.
- 2.2 The HSE assessment released on 30 April 2007 considered a total of 11 scenarios entailing some element of process failure: 5 of these related to Storage; 3 to Movable Containers; and 3 to Processing. The James report considers 3 scenarios.

3.0 Scenario 1: Accident on Site

- 3.1 Scenario 1 in the James report considers the consequences of an accident on site resulting in the guillotine failure of the transfer pipe work between a road tanker and fixed storage on site. This scenario was assessed by HSE as Movable Containers scenario (ii).
- 3.2 HEXCEL considers that the likelihood of the event occurring has been misunderstood and grossly exaggerated in the James report. Acrylonitrile will be brought to the development site by 27 tonne (34 cubic metres) road tankers from Teesside. Transportation laws require top loading tankers are used, with all valves above the liquid level. The tankers unload from the top, using a flexible sealed pipe leading directly to the storage tank protected area (bund) in which is housed a suction pump which draws the Acrylonitrile through the pipe work and out of the road tanker. If the pipe was severed, the Acrylonitrile would no longer be sucked from the tanker, thus eliminating any chance of a spillage.
- 3.3 In addition, the James report makes no assumptions about the presence or operation of mitigation/ control measures. It is also the case that the HSE assessment made no such assumptions. However, the transfer between road tanker and storage tank will take place within a small bunded transfer area. In

the event of any leakage, Acrylonitrile would remain within the bunded area which is required to contain a minimum volume of 110% of tanker capacity. Sensors would be located within the bunded area. At an appropriate trigger level (2ppm) of Acrylonitrile in atmosphere or in liquid, these sensors would trigger a foam spray which would contain and cover any Acrylonitrile spillage in seconds, preventing both fire and evaporation. The bunded area will be constructed (a) with a fall within its area, (b) to only accommodate a single transfer vehicle/ tanker and (c) with a sump located under its lowest part. Acrylonitrile as a vapour is heavier than air and thus will collect in the base of the bunded area and/ or in the sump.

- 3.4 In respect of Scenario 1, the James report:
- (a) Fails to take account of the proposed arrangement of top loading/ unloading tankers and pumping process;
 - (b) Does not take account of the physical constraints provided by bunding constructed tight to the transfer tanker location;
 - (c) Does not take account of the internal fall within the bunded area or the sump arrangement; and
 - (d) Makes no allowance for the presence and operation of sensors linked to automatic foam spraying equipment.
- 3.5 As a consequence, HEXCEL considers that whilst it is appropriate to assess the likely effects of Scenario 1 the James Report is inaccurate and misleading in this regard. The consequences of the event it describes simply could not occur.

4.0 Scenario 2 – Accident on road close to Duxford village

- 4.1 Scenario 2 in the James report considers the consequences of a traffic accident to a road tanker carrying Acrylonitrile on Hunts Road/ Ickleton Road in Duxford, causing a 50mm diameter hole in the tanker body and the resultant leakage, over an hour, of the whole cargo of 27 tonnes.
- 4.2 This scenario was not assessed by HSE because transport is comprehensively regulated by international laws.
- 4.3 HEXCEL considers that in the James report assessment:
- (a) the likelihood of a road traffic accident affecting a road tanker in the report has been considerably overstated;
 - (b) in the event of a road traffic accident the consequent likelihood of a major fracture to the tanker has been overstated;
 - (c) in the event of a road traffic accident the volume of Acrylonitrile that might be released has been significantly overstated;
 - (d) the response time for the emergency services has been prolonged unreasonably; and
 - (e) in the event of major leakage, Acrylonitrile would not accumulate in the manner suggested in the report – i.e. in an unspecified number of 6mx6m pools through the village.
- 4.4 The James report assumes 2.1 accidents per million driven kilometres (vehicle–km). That figure, based on data from before 1995 does not reflect the significant reduction in accident rates in the last 15 years and relates to all vehicle types,

and thus does not distinguish for accidents involving HGVs or for accidents entailing liquid spillages. HEXCEL considers that a more realistic current range of accident figures would lie between 1.24 and 1.9 per 100million veh-km. (See references [1] and [2].) Applying the highest end of that range i.e. 1.9 per hundred million vehicle-km – is more than 100 times less than the assumption made in the James report. The James report thus grossly exaggerates the risk of such an accident within Duxford.

- 4.5 The tankers used to transport Acrylonitrile will be ADR (International Laws for Carriage of Dangerous Goods by Road) certified and designed and constructed to withstand twice their own weight in end-on collisions (end-on collisions are considered to be the most likely event given the nature/ layout of the local road system and the relative absence of major side road junctions), and its own weight in side-on collisions. The 'built up' parts of Hunts Road and Ickleton Road through the village are subject to a 30mph limit. In addition, traffic calming measures at the entrances to the village - chicanes with priority signing - and speed humps along the two roads all serve to reduce traffic speeds, particularly for laden tankers. The combined effects of all of these factors, operating together, suggest that on a common sense basis, the prospects of a major accident occurring are highly remote.
- 4.6 HEXCEL has researched recorded instances of road traffic accidents involving AN. No known accidents have occurred in the UK; two road traffic accidents - both in the United States - have been identified. In neither case did the leakage from the tankers exceed 10 US gallons (or ca 37 litres/ 30 kg) of Acrylonitrile. The tankers that would be used will have lockable tank covers, and a protective turret housing to protect the cover mechanisms, which would reduce, in the event of any accident, the propensity for damage to the covers and hence leakage.
- 4.7 HEXCEL's preferred transport contractor has moved Acrylonitrile by road in the UK (over 400,000 miles in recent years) without incident since it started 20 years ago. Throughout the extensive history of use of the Hexcel site (and the adjoining Huntsman site) for chemical uses and processing, chemicals have been regularly transported into and out of the site, by road through Duxford, without incident. At times, that has involved up to 6 tankers entering and leaving the site daily, all without incident.
- 4.8 The James report assumes, in relation to a major accident, that the emergency services would not attend the incident for an hour, and that it would take a further 30 minutes to effect control of any spillage. Both these assumptions are unrealistically pessimistic. HEXCEL and Duxford are served by the Sawston Fire Station, which is located approximately 5km (3.1 miles) from Hunts Road/ Ickleton Road. Cambridge Fire Service has confirmed that a more realistic response time would be in the order of 10 minutes for the first appliance and 20 minutes for a further three appliances and foaming would be commenced within 10 minutes of the arrival of the first appliance. Containment of a spillage could be secured in a further 20 minutes.
- 4.9 Given the above factors it is considered that the prospect of Acrylonitrile accumulating in a number of pools throughout the village, as suggested in the James report, is highly improbable.

- 4.10 HEXCEL considers that in the process of attempting to assess the effects of Scenario 2 the James report has exaggerated the possibility of a road traffic accident involving Acrylonitrile transport and, when assessing the event of any such accident occurring, has made incorrect and overstated assumptions concerning the scale and hence the potential adverse effects of any possible spillage of Acrylonitrile. As a consequence, both the likelihood of any such event and its implications have been grossly exaggerated.

5.0 Scenario 3 – General emissions from Site

- 5.1 Scenario 3 in the James report focuses upon the increased cancer risk arising from the anticipated process losses of Acrylonitrile that would occur in course of normal operation of the CFP. It is acknowledged in section 9.2.6 of the submitted Environmental Statement (ES) that a total of about 1 tonne of Acrylonitrile will be emitted annually, from the proposed stacks, as a consequence of the operational processes on site. This is well within expected limits and those acceptable in law.
- 5.2 This scenario was not assessed by HSE, but was assessed within the ES by HEXCEL's consultants ERM Ltd which, unlike the James report, took into account the height of the stacks and layout of the surrounding buildings.
- 5.3 HEXCEL considers that in respect of Scenario 3:
- (a) the James report assumes that Acrylonitrile is carcinogenic to humans, whereas that remains unproven;
 - (b) for the purposes of assessment the James report has erroneously assumed that the process losses are dispersed in a single direction – from the SE to the NW from the plant over the village of Duxford; and
 - (c) as a consequence the conclusions drawn in respect of increased cancer risk to residents are considerably exaggerated and misleading.

Figures 16 and 17 in the James report illustrate the postulated concentrations of Acrylonitrile for differing weather conditions. Figure 18 seeks to illustrate the dispersion of a plume on a geographic basis across the village of Duxford. For the concentrations to occur in the manner illustrated in the James report, it has been assumed that the wind would always blow from the SE over Duxford when releases would occur or release would occur as a single event when the wind is from that direction. Neither is realistic. Wind analysis shows that winds blow from the SE for about 5% annually – or about 18 days a year.

- 5.4 Modelling of emissions of Acrylonitrile is set out in section 9.2.6 of the submitted ES and is shown in plan form in Fig. 9.6 of the ES which illustrates contours at 0.1 microgram/m³ intervals (copy attached). Using the US Environmental Protection Agency (EPA) Integrated Risk Information Service (IRIS) data, as used in the James report, could give rise to an increased risk of developing cancer over a lifetime of 1 in 100,000. Based on 60 years lifetime, this represents an increased risk of developing cancer of 1 in 6,000,000 per year for someone continually breathing that level. No residential development in Duxford is located within the 0.1 microgram/m³ contour. The incidence (number of cases diagnosed in any one year) of cancer (of any form) in 2006 was 403 per 100,000 population

for males and 351 per 100,000 population for females. In that context, the additional risk that could arise from the proposed development is infinitesimal. This is well below the 'broadly acceptable' criterion used in 'Reducing Risks Protecting People' (referred to in the James report as the 'HSE ALARP criteria'). Indeed, the annual individual risk as a result of exposure to Acrylonitrile would be much less than 1 in 6,000,000 (even in the unlikely event of being continuously present in this contour over a lifetime). Therefore, the 'intolerable' conclusion reached in the James report is incorrect.

- 5.5 HEXCEL considers that in respect of Scenario 3, the James report has misrepresented the volume of Acrylonitrile in emissions and has misunderstood the circumstances (and thus the potential consequences) of the releases that would be likely to occur.

6.0 Summary and Conclusions

- 6.1 The James report contends that the risks to the local population appear to have been significantly under estimated by the HSE. HEXCEL disagrees with the conclusions reached in respect of each of the scenarios cited in the James report, and as a consequence, considers that the James report greatly exaggerates the health and safety risks associated with the proposed CFP plant.
- 6.2 Scenario 1 in the James Report is inaccurate and misleading in that it fails to take account of the proposed arrangement of top loading/ unloading tankers; the physical constraints provided by bunding constructed tight to the transfer tanker location; the internal fall within the bunded area or the sump arrangement; and makes no allowance for the presence and operation of sensors linked to automatic foam spraying equipment. The consequences of the event it describes simply could not occur.
- 6.3 In respect of Scenario 2 HEXCEL considers that the James report has exaggerated the possibility of a road traffic accident involving AN transport, and in the event of any such accident occurring, has made incorrect and overstated assumptions concerning the scale, and hence the potential adverse effects of any possible spillage of AN. As a consequence, both the likelihood of any such event, and its implications have been grossly exaggerated.
- 6.4 HEXCEL considers that in respect of Scenario 3, the James report has misrepresented the volume of AN release in emissions, and has misunderstood the circumstances (and thus the potential consequences) of the releases that would be likely to occur. The 'intolerable' conclusion reached in the James report is thus incorrect, because it has used incorrect dispersion assumptions. The modelling carried out on behalf of HEXCEL provides a realistic and reasoned assessment of the actual health risks to the individual.
- 6.5 HEXCEL accepts and acknowledges that the use storage and handling of Acrylonitrile as part of the CFP process entails some element of risk. There is, however, no such thing as 'Nil Risk'. The assessments set out in the submitted ES, carried out by HEXCEL's consultants, have been reviewed by HSE, whose role is to protect people against risks to health or safety arising out of work activities. HSE's own assessment of risk and safety led to their clear and

unequivocal advice to SCDC in respect of the outline planning and Hazardous Substances Consent applications that there are no safety grounds on which to refuse either planning permission or Hazardous Substances Consent. The James report has been shown to have either misunderstood or misrepresented operations on or in relation to the proposed development and has thus incorrectly assessed and grossly exaggerated the real life risks arising from the proposed development.

References:

- [1] Guidelines for Quantitative Risk Assessment – Part 2, Transport (The Purple Book CPR18E, December 2005 The Netherlands Organization of Applied Scientific Research) puts the probability (for releases in excess of 100kg) for tankers in built-up areas being subject to an accident at 1.24 per one hundred million vehicle-km.
- [2] Lees' Loss Prevention in the Process Industries (Third Edition (2005)) indicates that puncture frequency is 1.9 per hundred million vehicle-km, of which a release of in excess of 1500kg (1.5 tonnes) is put at 1.4 per one hundred million vehicle-km.

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