

JG Henderson & Associates

Fire Service Studies & Evaluations – Fire Investigations
Fire Risk Assessments & Audits – Fire Expert (Litigation) Services

Mr. Don Earl, A. Assistant Director
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December 22, 2008

Re: The Biedermann Fire

Dear Mr. Don Earl:

The following are my responses to the questions raised in your email of November 20, 2008.

Question 1:

Assess the adequacy of the Emergency Response Plan (ERP) Biedermann Packaging Inc. and their preparedness in the context of the nature of their facility and type of chemicals/materials handled in the plant as it relates to the fire that occurred at 36 Head St., Dundas on July 26, 2007, including measures to address the management of the firefighting runoff water and secondary containment, as well as the location of material to implement the ERP in the event of a fire.

This question encompasses not only the ERP but also the compliance of the Biedermann facility to the applicable codes; namely, the Ontario Building Code (OBC) and the Ontario Fire Code (OFC). Therefore, my response includes a discussion of these references.

Upon conducting a Building and Fire Code compliance audit, I have concluded that the Biedermann Plant was in compliance with both the OBC and the OFC. In fact, the facility exceeded the minimum requirements of these Codes in several areas that ought to have had a very positive impact on mitigating the extent of fire and environmental damage during this fire. These additional risk mitigation measures included:

1. A firewall that divided the Biedermann Plant. Although a firewall was not required in the design of the plant, a 4-hour firewall was incorporated. This passive fire protection measure had a significant positive impact on the fire incident as it significantly reduced and even prevented the fire from spreading to the north building where a considerable amount of pesticide product was located.

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If the fire had of spread to the south building and in the absence of an environmental mitigation plan by the IC, it could be anticipated that the contamination would have been much more severe as more than double the amount of fire flow would have most likely been used to contain the fire. The south side of the plant represented less than 50 percent of the total area of the plant; hence, less than fifty percent of the building's total fire-load. The inclusion of this fire protection measure would make the fire much easier to contain and much safer on the fireground for the attending responders.

2. Biedermann initiated and funded HES-Fire to conduct a Code compliance audit. Rarely do the managers of a low hazard industrial occupancy (Group F, Division Occupancy) request and fund such a safety audit. This provided the HES-Fire an opportunity to identify and request (issue a compliance order if necessary) the correction of any non-code-compliance issues that may have existed. However, HES-Fire reported that only minor non-code-compliance issues were observed and corrected. This demonstrates the safety culture that was practiced by management and their employees.
3. Facility familiarization tours were provided by Biedermann to the HES-Fire. This is a significant risk reduction measure although it appears that the full benefits were not achieved as the information appeared not to have been passed from HES-Fire (Fire Prevention) to the HES-Fire Operations. Even though this would have been an ideal opportunity for HES-Fire to develop a pre-incident plan to this facility for their responses to this facility, they failed to take this opportunity to better prepare for a response to the Biedermann facility.
4. An inventory of the pesticide products was provided to the HES-Fire. (It appears that the inventories were passed to the Fire Prevention Cell who may not have passed it on to operations, however, this has not been confirmed).
5. Biedermann installed a spill containment system that was capable of containing approximately 210,000 gallon of liquids (This containment was not required by the applicable Building and Fire Code). Such a system is rarely incorporated unless it is required by applicable codes.
6. An ERP was developed in 1999 and the Plan was revised in 2005. Neither an ERP nor a Fire Safety plan was required for this facility by the applicable codes. This Plan had all of the elements normally found in such plans where they are required, plus the above noted actions of Biedermann complimented their ERP.

Therefore, based on the foregoing I can only and objectively conclude:

- Although an EMP was not required by the applicable Building and Fire Codes, Biedermann developed an ERP. In conducting an analysis of the adequacy of the plan, I found it to be a comprehensive document that addresses all of the critical elements of an ERP.
- Although the Biedermann facility did not require (by Codes) a containment system, they incorporated one into their plant that has a capacity of approximately 216,000 gallon. This was a very significant conservation mitigation measure as it would give the IC additional time to set-up their conservation containment strategy.
- Containing runoff (fire flow) water from a firefighting operation is the sole responsibility of the attending fire department. (with the assistance of other specialist when available and requested by the IC).

Question 2:

- *Assess the implementation of the ERP by Biedermann at the time of the fire at 36 Head St., Dundas on July 26, 2007.*
- *Did Biedermann take sufficient action to control the firefighting runoff water?*

The third operational priority of a fireground operation is property (environmental) conservation. Protecting air, ground, and water is an integral component of all hazard material responses by the attending fire department. During a fire emergency operation, the fire department's IC is in charge of the scene. Non-emergency personnel do not take part in such operations unless under the direct supervision and authority of the IC. Therefore, it is my opinion that the responsibility for mitigating the run-off water from the operation was solely that of the IC. However, in many similar incidents, an IC will liaison with a building owner for the purpose of: gaining insight into the facility's design and construction type, its layout, the fuel loading, gaining an understanding of the operation including the type and quantity of hazardous materials located on the property. Often where such occurs, the IC gains a more in-depth understanding of the hazard, and knowledge of the resources and expertise that the building owner may have that can assist in the fireground operation. Even when lists of the HAZMAT materials are supplied and/or available to an IC, this contact is made with plant managers/operators as such inventories are never static. Therefore, contact is made to confirm current quantities and location of the various products.

It is **never** the responsibility of a building owner to *take action to control the firefighting runoff water* while a fire emergency is in progress unless a specific action is requested and directed by an IC.

During all fires and hazardous material emergencies, the IC is in full and complete charge of the fireground perimeter. However, after liaison with other specialists including building owners, the IC may request and direct a specific action to be taken. Where such may occur, it is under the direct authority and supervision of the IC.

Question 3:

Did Biedermann adequately advise the Incident Commander of the products that were stored in the south building (particularly Diazinon)?

The IC stated in his report that he knew at the front end of the operation that he was fighting a fire in a pesticide plant. Moreover, the IC's personnel (fire prevention and operational tours) visited the plant and knew or ought to have known that the plant contained pesticide materials that could be harmful in large quantities to the environment. As a result, the IC ought to have been addressing the contaminated firefighting runoff when he developed his initial fire attack plan notwithstanding his full knowledge of a particular pesticide that may or may not be directly involved. Therefore, as the IC knew that this was a HAZMAT operation from the very beginning it was his responsibility to address it as such in his strategic operational plan.

Again, if an IC feels she / he does not have sufficient information regarding a HAZMAT operation, contact is made with HAZMAT specialists and other personnel including building owners and plant specialist that may provide the required information. This process is common practice as ICs attending a HAZMAT operation routinely seek out the plant specialist and managers to obtain all of the information that is possible.

It is my understanding that plant personnel were available at the very front-end of this incident.

Question 4:

Was it foreseeable by Biedermann that HES-Fire would use 5,000,000 L of water to extinguish the fire at their facility?

Under no circumstances was it foreseeable by Biedermann personnel that HES-Fire would use 5,000,000 L of water to contain and extinguish this fire. In fact, if a fireground specialist, in the preparation of a pre-incident plan and using one of the industries accepted methodology to determine the fire flow requirement for this facility, less than one-quarter of fire flow that was used would have been identified in the calculation. Moreover, as the fire was fought in a defensive mode of operation, all that was necessary with respect to fire flow, was containing the fire from spreading – not extinguishment.

Question 5:

If Biedermann had informed the Incident Commander that Diazinon was stored in the south building and was informed of the increased environmental risk of this product, is it likely that the IC would have altered or used a different fire attack plan?

No. For reasons as discussed in question 3, IC knew that he was attending a hazardous material incident. If additional information was required, he ought to have sought out that information. However, notwithstanding the above, once having established that the incident was a HAZMAT pesticide response, even though one product may be more harmful to the environment than another, an IC

does not have anyway of knowing how much runoff water of the lesser hazardous product is required before serious or even equal damage occurs. Containing fire flow runoff is a concern at all HAZMAT operations and the strategic attack plan that is developed by the IC at the very beginning of the operation must address this operational requirement. The failure to address this issue at the time the attack plan is developed is to ignore one of the basic and fundamental requirements of the fireground operational priorities.

It must be remembered that the IC sets the objectives, decides on the tactics necessary to achieve those objectives, and then assigns crews to complete the tasks associated with each objective and tactic.

It is obvious that conservation was not an objective of the fire attack plan used in this fire incident even though *conservation* is one of the three operational priorities of all fireground operations. In this regard it is noted that the three operational priorities are:

1. Life-safety (occupant and attending firefighter)
2. Fire Extinguishment
3. Conservation

With respect to the first priority, this incident posed an extremely low risk to life-safety. Firstly, there were no personnel in the building at the time of the incident; hence, no rescue operation required. Secondly, the fire was declared a defensive mode of operation. This means that firefighters were not placed inside the structure where they would be exposed to toxic, superheated smoke and heat, no potential for flashover, draft, or roll-over, and no exposure to the potential of structural failure. Therefore, minimum resources and planning was required for this operational priority.

With regards to the second operational priority, fire extinguishment, this was also a low demand operational priority. When a defensive mode of operation is declared by an IC, he has made a decision that the building of fire origin is lost to the fire; that it is beyond saving. Operational efforts then are directed at preventing the fire from spreading to the exposed building(s). As the exposed building (the south building) was separated from the north building by a 4-hour firewall that had a parapet extending above the roof of the two buildings, the potential for fire extending from the south building was greatly reduced. As a result, only several aerial monitors would be required to prevent the fire from spreading to the south building. (This does not mean that the aerial monitors had to flow water constantly – only to wet down and to reduce the initial heat flux).

Therefore, as the first two operational priorities were "low demand" in both strategy requirements and in the fireground resources, it is my opinion that the IC had adequate opportunity to address the requirements of the third operational priority; *conservation*, and it ought to have been addressed from the beginning when the strategic plan was developed and implemented.

Therefore, it is my opinion that whereas the IC knew he was attending a pesticide fire and whereas the same conservation tactics were required for all pesticide contaminated runoff water, specific knowledge of one product would not have altered his tactical plan.

Question 6:

Assess the actions of Biedermann at the fire scene including the management of the potential for, and actual, firefighting runoff water. (More specifically, assess the actions of Biedermann once it was known that there was a risk of firefighting runoff water, as well as the actions taken when the water first began to leave the site at 36 Head St., Dundas.

As previously stated in the above answers, conservation is the third operational priority of a fireground operation. Therefore, it is my opinion that the Biedermann personnel did not have a responsibility for the containment of the fire flow runoff.

However, when an owner has knowledge of a specific hazard when a fire occurs in their facility, it is reasonable to expect that the information would be passed to the IC. However, I do not have any knowledge of the information that was passed to the IC or his accessibility or receptiveness.

These are my objective answers to the posed questions. If additional information or clarification is required, please contact me at your convenience.

Respectfully submitted,

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Senior Fire Protection Specialist

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