

A WALK IN THE CHEMICAL PARK – PROCESS SAFETY PERSPECTIVES

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Chemical parks play host to many chemical manufacturers within Europe and offer many business advantages to both the site owners and guest companies. Clearly high density hazardous operations have a major implication for process safety management but such physical arrangements in Europe are hardly novel. Increasingly the challenge for management of major accident hazards within chemical parks is to attain a seamless working cooperation between separate legal enterprises so that overall safety integrity is preserved and then improved.

KEYWORDS: Chemical park, process safety

INTRODUCTION

There are many terms in popular use to describe a chemical park. Industrial park or multi-occupier site conveys the same meaning however chemical park appears to be in widespread usage across Europe and is the term which is used throughout this paper

A chemical park can be defined as a chemical manufacturing complex which possesses controlled entrance and exit points and accommodates several separately owned chemical manufacturing companies. The perimeter normally is secured by fencing and gives rise to the terms inside the fence and outside the fence which respectively delineate hazardous and non hazardous operations. There are no public roads as such inside the fence.

CHEMICAL PARK ORGANISATION

Typically a chemical park has evolved from a single legal entity whose safety organisation has controlled all activities inside the fence and has therefore offered a single point of contact to the outside world as illustrated in Figure 1. It is the loss of a single point of contact that can often lead to concern amongst local authorities charged with regulating hazardous operations on chemical parks¹.

In order to save costs many organisations have invited guest companies onto site either to operate existing facilities or build new facilities with a view to providing the guests with site services and infrastructure. The advantage for the host (often referred to as the major user) is that the centralised overhead is shared with the guest companies. The advantage for the guests is that they have on site an already existing and practised site service which allows them to concentrate on their core business. In some countries it is state policy to encourage the ongoing viability of large sites or at least prevent their disuse not least due to the possible change of land use and consequent land remediation issues.

Another option to the major user concept is the separate site operating company where the site services and infrastructure are operated by a company separate to its users and clients as illustrated in Figure 2.

Such an example in Germany is InfraServ on former Hoechst sites⁶. Another example in the UK is ETOL who supply services to a chemical park in Teeside⁵. The

advantage to users is that they receive a customer focussed service which may operate on a lower cost basis compared to services operated by a major user or indeed single occupier.

IMPLICATIONS

So why should chemical parks in themselves have concerns for process safety?

The first is that the growing issue of chemical parks has gone hand in hand with the European chemical giants restructuring their resources in order to compete in the global market. Large company safety departments have fragmented. Safety professionals may find themselves working for different companies on the same chemical park whereas before they had all worked for the same organisation on the same site. Fortunately in this case the former company relationship can sustain the exchange and sharing of information between individuals which is pre-requisite for safe operation between neighbouring hazardous installations¹.

In the medium to long term for sustainable networking a more formal arrangement needs to be in place – out of which naturally flows informal sharing of valuable information. An example in Germany of such a network is the Industrial Practices Interest Group, IGR,² which arose from the break up of Hoechst AG and provides technical information on process safety to its subscribers from several guest companies on the same chemical park. Clearly it was felt important on the break up of Hoechst that its process safety knowledge base was preserved as far as possible.

The second concern is again symptomatic of large company fragmentation. Increasingly process safety managers find themselves in slimmed down departments and devoting much of their time to promoting process safety within their own organisations. They are therefore more inward looking than before. This can militate against exchange of information between guest companies on a chemical park even between seasoned professionals who have worked together in the same company.

In effect the process safety concerns raised about chemical parks is mainly one due to parallel developments – i.e. large company restructuring and cost cutting etc rather than the physical reality of several hazardous operations working in close proximity to each other. Such an arrangement has existed for almost as long as the European chemical industry itself.

However independent legal entities co-existing on a chemical park do pose extra challenges in several aspects and some are mentioned below.

One issue is emergency planning. In the case of the major user and the site operating company the threshold between normal operation and emergency will need careful consideration and dissemination within the chemical park. The authority of the site emergency services during an emergency will take precedence although undoubtedly cooperation from the guest companies will be vital in addressing the threat.

Another issue is waste treatment. How shall the relationship between the users of the chemical park and the chemical park operator be configured as far as legal responsibility for waste is concerned? In Germany each individual chemical park user is responsible for the waste which his operation(s) produce.

This responsibility includes

1. classification of the waste according to the Waste Code Regulations and according to the relevant Water, Chemicals and Hazardous Substances laws
2. making the waste available (for the steps outlined below)
3. allowing appropriate parties to take over the waste (transfer)
4. gathering the waste together
5. transporting the waste
6. storing the waste
7. pre-treatment of waste so that it can go on to be recycled or disposed of
8. recycling and disposal

Each chemical park user must take care of these activities. The scope of his involvement in each one depends on how the disposal of waste is organised in that particular chemical park. The user can undertake disposal himself if he has his own waste treatment plant or he can outsource this task to a third party outside the chemical park or to the operator of the chemical park. In the last two cases, “disposal by a user company’s own means” (*Eigenentsorgung*) becomes “disposal by a party external to the user company via a third party” (*Fremdentsorgung durch einen Dritten*).

The third party can gather together, transport and store and also recycle or dispose of waste insofar as such waste is **not** normal household or business type waste which would usually be transferred to the official public waste disposal authority (i.e. the local council rubbish collection service).

Whether a chemical park user’s industrial waste can be transferred to the operator of the chemical park for disposal depends on the agreement of the local authority and local town council. If such an agreement has been made, chemical park users must transfer such waste to the chemical park operator. The chemical park operator can dispose of such waste if he has suitable processing plant. If not, he must transfer the waste to the legal public authority. It may also be possible that such waste could be transferred to a “third party” commercial waste disposal company which is itself situated on the chemical park and thus a user of the chemical park.

Finally an important issue affected by chemical parks is insurance. This is a factor which can be at the forefront of minds when considering either opening up a chemical park to guests or becoming a guest on a park. The proliferation of third party hazardous operations clearly has an influence on decision making although the overall risk (the number & size of hazardous operations) compared to a single occupier site may remain unchanged or even reduced³.

Almost all of the above aspects can be addressed in advance through site contracts and uniform rules⁴. How is adherence to these rules monitored? Clearly a balance needs to be struck between on the one hand excessive interference by the service provider into the business of a user and on the other hand a laissez faire and irresponsible approach. There is evidence to suggest that the contractual or rule based relationships which exist on a chemical park has resulted in a greater preparedness and response to the threat of major accident hazards.

Neighbouring companies on the same chemical park must manage productively their relationships with each other. Many companies on chemical parks own shareholdings in

each other so it is unlikely that any disputes will remain unresolved for long. Chemical park democracy or the ability for each company on a chemical park to influence important decisions affecting potentially their own business is an important issue as far as process safety is concerned. The marketing and commercial competition between chemical parks suggests this aspect will become ever more transparent.

An illustration of the competition is offered by Degussa AG who in 1997 launched an initiative to bring investors to the main production site of Marl in the Ruhr Valley and transform the site into a chemical park. Now under the auspices of ChemSite, the park has seen 10 new companies start up since 1997 and still up to 100% of the various sites available for new arrivals as Table 1 details.

Table 1. Land available for chemical park development; ChemSite Initiative, Ruhr⁷

Location	Area available for investors in ha (acres)	Total area in ha (acres)
Marl chemical park	60 (148)	650 (1,605)
Gelsenkirchen-Scholven	4 (10)	250 (617)
Gelsenkirchen-Horst	40 (99)	165 (408)
Castrop-Rauxel	15 (37)	106 (262)
Bottrop	12 (30)	12 (30)
Intermunicipal industrial park Dorsten/Marl	67 (166)	88 (217)

FUTURE WORK

In conclusion the legacy of a chemical park on a brownfield site will often play a significant part in how it is perceived by employees, the authorities and the public. It would be interesting to contrast the experiences of chemical parks within Europe to that of chemical parks on greenfield sites in developing countries outside of Europe. Does starting from a clean sheet of paper result in vastly different approaches to that in Europe. Can we also learn from examples where the chemical park concept has not worked particularly well from a process safety perspective? Finally can we identify the major chemical parks in Europe and arrange exchanges of knowledge and experience specific to process safety so that we can distill out some general guidance and best practice on the management of chemical parks? As far as the last question is concerned EPSC is in discussion with our US counterpart, CCPS, about future collaboration in such guidance.

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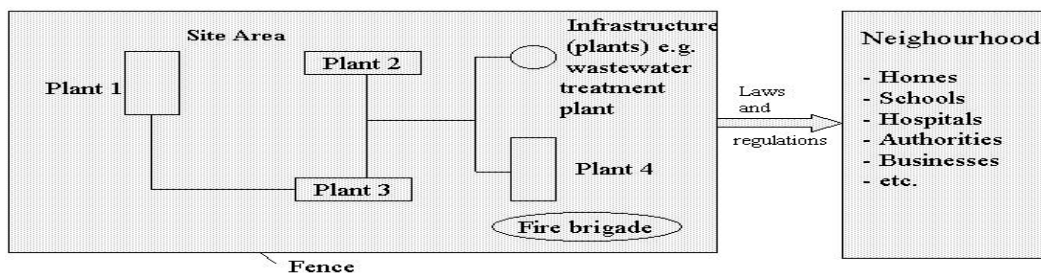


Figure 1. Conventional chemical site (several plants, one legal entity)

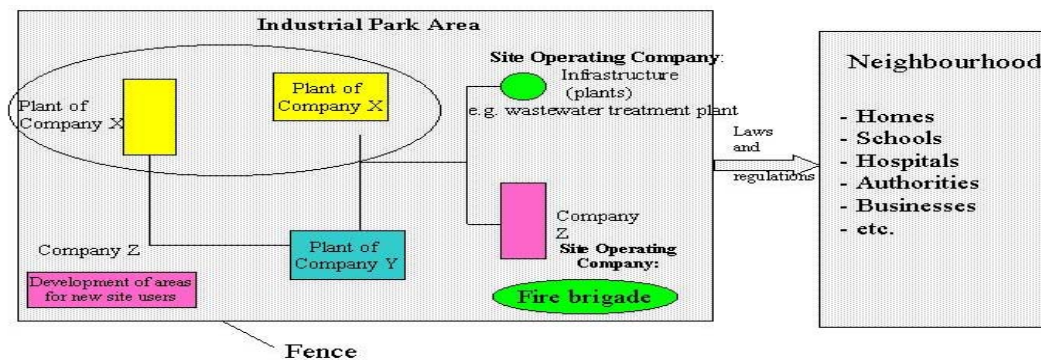


Figure 2. Chemical park (several plants, several legal entities)