16/09/1997

Risk factor in petrochemicals

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THE advertisement was tucked in an inconspicuous corner of the newspaper. The information on the joint project by national oil company, Petronas, and major chemical producer, Union Carbide Corporation (UCC), to say the least, was technical.

What does it mean to a layperson when a notice states: "...the Department of Environment is in the process of reviewing the terms of reference (TOR) for the detailed Environmental Impact Assessment report of the proposed second ethylene cracker and derivatives petrochemical plants... the public is welcomed to give comments regarding the (TOR) .."?

Not surprisingly, records show no one had gone to the DOE to read the document. Well past the Aug 21 deadline, the department still had not received any written reply from the public.

Notes an environmental consultant: "It is a pity that there is a lack of public interest in this project considering this is the first time members of the public have been asked to give their views on a petrochemical plant."

Petronas has teamed up with UCC (notorious for its 1984 chemical accident in Bhopal, India) to build two petrochemical plants in Terengganu.

One is at Kampung Tok Arun, sited next to Petronas' fifth and sixth gas processing plants (now under construction). Gas will be tapped from these plants to convert it to ethylene. The other plant will be at nearby Kerteh, to further process ethylene into a variety of derivatives that are to be used as base materials in the manufacturing of plastics, polyester fibre, resin and other chemicals.

The processes to harness these feed stocks (ethylene oxide, ethylene glycol, ethanolamines and other substances) will be done under high pressure and temperature, resulting in the release of various noxious gases and toxic waste. Between the two plants, there will be four parallel interconnecting underground pipelines to transport ethylene derivatives and raw water which will be sourced from the Paka River. A barrage at the river will be built for water impoundment where a huge volume of 14 million gallon per day of water will be pumped from it to cool the plant at Tok Arun.

Because there is always the risk element of fire outbreaks, explosions, chemical spills and toxic gas emissions, any EIA for petrochemical industry must be accompanied by a risk analysis report, quantifying the potential hazards it poses to workers and the nearby community.

Despite the risks the industry poses, the DOE's recent exercise failed to solicit response. The DOE director-general Tan Meng Leng believes that the absence of interest in the project is rooted in public apathy.

Adds his deputy, Rosnani Ibrahim: "When we want public participation, we don't get it." But Environmental Protection Society of Malaysia adviser Gurmit Singh counters: "How can members of the public react to something that they don't really know?"

Just like the manner in which the advertisement was written and placed in the newspaper, little is known about the petrochemical industry in Malaysia in terms of the impacts it exacts on public health, safety and the environment. Inaccessible information on the industry's operation may have contributed to the present state.

Gurmit Singh insists: "It is in the interest of the industry to be

transparent. It is part of good environmental performance. In this case, we need to be even more careful given the fact that UCC was responsible for the Bhopal industrial disaster."

On that tragic day, Dec 3, 1984, UCC's pesticide producing plant in Bhopal, India, leaked a highly toxic cloud of methyl isocyanate, killing 2,000 people instantly. Since then, another 8,000 people have died, with an average of 10 to 15 deaths a month. According to the International Medical Commission on Bhopal, the survivors numbering some 50,000 are permanently disabled. They suffer chiefly from neurotoxicological damage and posttraumatic stress syndrome.

UCC denied liability and shifted the blame to its Indian counterparts admist worldwide condemnation. After a long legal battle, UCC paid the survivors US$470 million.

The Bhopal tragedy has led to worldwide protest against UCC. In the United States, there is a strong lobby against the petrochemical industry.

But in Malaysia, the industry enjoys a relatively low profile, although it contributes a lion share to the nation's earnings - with RM15 billion of investment committed up to the year 2000 and an annual production close to RM12 billion.

However, as geomorphologist Dr Sharifah Mastura Syed Abdullah of Universiti Kebangsaan Malaysia (UKM) points out, the public in general does not realise the implication simply because, "they have no idea what it is although the products from petrochemical industry can be found virtually in every home."

Unless one is absolutely a die-hard green consumer, it is indeed impossible to avoid using things that are made from petrochemicals. The ubiquitous, non-biodegradable plastics manifested in various forms and shapes, disposable diapers, pesticides, solvents, car components, pharmaceuticals and textiles are just some of the hundreds and thousands of items churned out by the industry.

Although the end products themselves give rise to the problems of waste disposal, those in the industry would insist that the domestic market is still very small.

Says an investment analyst: "Owing to Malaysia's large gas resources - with 85 trillion cubic feet of proven gas reserves - it has huge potential to be a big producer of petrochemicals."

While other countries, notably the United States and Germany, had relentlessly developed a host of products from hydrocarbon-based materials (oil, gas and coal) since World War Two, Malaysia only began its foray a decade ago.

"Compared with other countries," notes polymer researcher Associate Professor Dr M Nasir of Universiti Sains Malaysia's Industrial Technology department, "Malaysia is a relatively new player."

But things are changing fast. Under the national second industrial master plan (IMP), the petrochemical industry is expected to play a key role in shaping the country's future. Prime Minister Datuk Seri Mahathir Mohamad had recently said the chemical and petrochemical industry would be developed as a clustered international network over the next 10 years under the second IMP.

Leading the way is Petronas. It intends to turn Malaysia into "a regional petrochemical hub". In a faxed statement, Petronas says it will continue to act as the catalyst to expand the petrochemical industry in the country.

Petronas will continue to enter joint ventures with foreign partners to benefit from their technology. Besides UCC, Petronas' partners include BP Chemicals, BASF, Idemitsu Petrochemical and Mitsubishi. Most of the plants are concentrated in Kerteh, Kuantan, Pasir Gudang, Johor Baru, Prai,

Bintulu and Labuan (See chart).

Given the flurry of activity, air quality researcher Azman Zainal Abidin of Universiti Putra Malaysia foresees the air quality in these areas to deteriorate in the near future.

For now, according to Tan of DOE, it appears the air quality is still under control. A study on Pasir Gudang's air quality by the department last year, he says, shows "nothing extraordinary".

Nevertheless, says Azman, the burning of hydrocarbon emits lots of volatile organic compounds. Hydrocarbon, he explains, is a precursor to the formation of photochemical oxidant, which is responsible for smog.

But he thinks the level of pollution in Kertih is still under control on two counts: it is a coastal area facing the relatively open South China Sea and it has a strong wind system to disperse and dilute the pollutants. The North-East monsoon, which brings heavy rain, also helps to clean up the place.

Still, Azman is worried. While the primary air pollutants may not be high now, in the middle and long term, he cautions, "there is a possibility that there will be a higher incidence of acid rain."

Acid rain results when air pollutants such as nitrogen oxide and sulphur oxide react with moisture in the atmosphere. And if the Meteorological Services Department's reports on acid rain are of any indication, the acidity of rain in Kerteh and Kuantan has increased since 1991 (See chart).

Azman deduces that the authorities will soon have to control the emissions. Concurring, Dr Mohd Isa Abdul Majid of the National Poison Centre says there is a need to ensure that the emissions do not reach an unhealthy level because hydrocarbon pollutants "are carcinogenic".

There is also the question of expertise. What guarantee does Malaysia have that there will not be a repeat of Bhopal? Malaysia can only hope multinational corporations will not practise double standards by imposing strict standards in their home country while being lax in developing countries as alleged by Tara Jones in her book, Corporate Killing: Bhopals Will Happen.

Petronas insists that none of the chemicals to be produced with UCC is toxic. It gives its assurance that both companies will "make all efforts to assure safety in the production, distribution and disposal of chemical products and to take every preventive measure to protect the people in and outside the plants as well as the environment." (See accompanying story)

And if the need arises, says Rosnani of DOE, "we will seek the expertise of the US Environmental Protection Agency to help us evaluate the project just as it had done for the central toxic waste treatment facility at Bukit Nanas, Negri Sembilan."

Can Malaysia seek comfort in the UCC chairman William H Joyce's statement in its homepage that it will be spending US$125 million per annum over the next five years on worldwide expenses related to environmental protection?

The only way to ensure that UCC and other petrochemical companies operating in the country adhere to internationally accepted standards is for the public to remain vigilant, says Dr Jasimuz Zaman of USM's chemical engineering faculty.

"Public interest groups must ensure that the conditions in the EIA are followed and that all steps to minimise risk are taken," he notes.

There is still an opportunity for the public to exercise their rights. The detailed EIA for the Petronas-UCC project is expected to be ready in a month or two and it will be made available for public comment before the DOE makes a final decision.

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