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INTEGRATION OF SAFETY WITH LOCAL ADMINISTRATION

INTEGRATION OF SAFETY WITH LOCAL ADMINISTRATION

(DR. M.G. SRIVASTAVA)*

Most countries have laws concerning Safety of factory installations, health and safety of workers and safety of environment. Barring a few exceptions, countries round the world have also enacted pesticide laws which especially focuss on the safety aspects in the production, distribution and use of pesticides. Each of these laws has its own implementation agency. Besides there exist municipal facilities like Medical and Health services, Fire services etc. which can and do contribute towards safety in the pesticide manufacturing units.

The diverse areas of safety administration being controlled by different legislations, it is essential to identifytheir scope. In India, for example, some of the laws directly involved are -

FACTORIES ACT. - Equipment & operational Safety & Hygeine
FIRE & EXPLOSIVES ACT. - " "
ENVIRONMENT PROTECTION ACT. - Environmental Safety
INSECTICIDE ACT. - " & Occupational Safety
LABOUR ACT. - Occupational & Health Safety
POISONS ACT. - Health Safety

These laws are well intended but tend to overlap at the factory level. In order therefore to optimise the safety benefits and minimise conflicts in law due to differing norms & standards, it becomes essential for the managements of pesticide factories to integrate their efforts with those of the local administration. Most companies have therefore developed procedures and drills for constructive interaction and proposeful integration with the local administrative agencies.

In this paper, the author has drawn from the procedures and practice in Indian companies like ICI India, Hindustan Insecticides Ltd., Hindustan Organic Chemicals Ltd. besides the relevant document of FAO & WHO.

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TYPES OF INTEGRATION

The integration of the Safety requirements and measures may be broadly classified as -

a) Routine measures

b) Emergency measures

For the purpose of this paper, these areas are separately considered in further detail.

Routine Measures

These involve the matter of course inspections and reports of implementation of laws. A few examples are provided to explain the task -

a) Inspection Under Factories Act. - Inspector of Factories is required to visit the pesticides unit at least once every year to inspect amongst others the proper implementation of the safety aspects covered by the Act, viz planned maintenance of plant & machinery, Safety systems, factory hygeine etc. The inspection also involves verification of implementation of action/s recommend during the previous inspection/report.

Inspection of boilers, in some countries is carried out by specialists e.g. Boirler Inspector to satisfy on the condition of the vessel, valves etc. whose failure may cause a major accident

The factory management must extend cooperation to the inspecting official by making available the relevant data as required and maintained under the Act.

b) Fire & Explosives Act. - Inspections under the act. is carried out by Explosive Inspector to ensure that the safety measures at the solvent storage, inflamable product storage, compressed toxic or combustible gases are adequate and as per the requirements of the Act. The containers/storage vessels are required to conform to prescribed specification and state of maintenance.

c) Environment Protection Act. - The Directorate of Environment and the Pollution Control Board are responsible for the implementation of this act. The Act itself is aimed, at ensuring that the factories do not release undesireable and untreated effluent into the sewar or water systems, that no toxic solid substances are disposed off on soil or in water and that toxic fumes or hazardous dust are not let off in the atmosphere. For these appropriate exhausting & treatment facilities are established. Besides the Pollution Control authorities also monitor the effluent, air samples etc. to ensure that they are safe.

Since pesticides factory should/do maintain data of the treatment & disposal of wastes, these should be made available to the inspecting officials.

d) Insecticide Act. - Also called Pesticide Law in some countries, it aims amongst other things to regulate the production of only approved (Registered) pesticides. In India Pesticide Licencing Officers inspect the factory to satisfy that apart from the proper plant and equipment, the hygeine and safety precautions in handling and storage of toxic chemicals are provided for and necessary safety equipment for workers and treatment of effluent/waste disposal as recommended by the concerned officials are available before the manufacturing licences granted. The Act. also requires data maintenance & health records.

e) Poisons Act. - This act regulates the storage, handling and use of poisonous substances. A number of pesticides are included under the Act. The Act requires separate licencing besides prescribed labeling, packing & storage, security etc. Most of these aspects are also covered by the Insecticides Act. and hence proper integration with local officials is essential.

f) Labour Act. - It is the principal law that demands & enforces rules pertaining to the safety of workers and monitoring of their health. Labour Inspectors visit factory to check on the observance of the precautions & facilities as required under the law.

In the normal course, the requirements of these various laws are fulfilled by the pesticide companies. However in such laws where the parameters are common, the limits laid down may very eg: the specifications of treated effluent under Pollution Control Act. may to different from the Residue levels permitted by the Pesticides Act. Similarly the work place ventilation requirement under the Factories Act. may be different than what is required for toxic pesticides. For these reasons, integration of safety measures requires to be done with the local administration to ensure smooth working of the pesticide formulation unit. It needs to be bourne in mind ahat state laws get precendence over the company's norms. For acceptance therefore, it is best to adopt the most stringent one among the norms.

Emergency Measures

The importance of integrating measures and resources of the factory & the local administration (for safety) is greatest in an emergency situation caused by an accident or an undesireable episode in a pesticide factory. These may involve hazardous spillage/leakage of chemicals, injury/damage caused by failure of plant/equipment or through fire and natural calamity (flood, earth quack etc.). In all these situations apart from the safety resources available on factory site, urgent assistance is required from civic services eg. medical aid, fire brigade etc. This is an important area of local integration.

I. INTEGRATION

The integrative actions envisaged are described below -

a) WITH DISTRICT ADMINISTRATION

District administration is responsible for the well being of the community including personal safety. Similarly they have responsibility towards the property of the people includin other factories and establishments. District administration also have substantial influence or control or both over the locally available services. Hence integration with District Administration involves :

A. Information (Unit Specific)

1) Informing the authorities of the nature of operations/ working of the plant or factory.
2) Informing them of the toxicity hazards of pesticides, Solvents and adjuvants stored and used in the factory.
3) Informing them of the volumes of inflameable products in the factory and the type of fire hazard that may be anticipated.
4) Informing them regarding the safety arrangements provided in the factory to deal with any emergency that might arise.
5) Informing about the areas where additional support may be required in the event of a major episode.

B. Reporting (Accident Specific)

The various laws require that any accident involving life or limb or loss of property or other events eg. leak or spillage of hazardous contaminants etc. must be not only be recorded in the factory documents but also reported to the concerned officials/departments.

b) WITH FACTORY INSPECTORATE

The inspectorate being mainly concerned with the safety of the factory hardware and hygeine, proper interaction with the Inspector/s of factory should be maintained on a regular basis. Any case of equipment failure or storage vessels or fire etc. must be reported to the concerned officials of the directorate. Similarly in the case of an enquiry under the law following a major episode, the company should extend full cooperation to the investigating officials.

c) WITH FIRE SERVICES

Pesticide factories are required to maintain some on-site fire-fighting facility and personnel trained in the use of such equipment. However, the large storage of inflameable solvents, finished products and often combustible technical grade pesticides and chemicals or even dust explosion may cause a major fire in a formulating unit. In such cases, (particularly in the case of a solvent fire), the on-site fire fighting facility may not be adequate and the help of a nearly state/ municipal FIRE BRIGADE becomes essential. For this

purpose, it is not only essential to maintain close liasion with the Fire Services but also ensure a rapid communication system. This also necessitates keeping the fire station informed of the nature of chemicals held in the factory and facilities available within the factory. These would enable the Fire Services to responed quickly & carrectly should an emergency arise. (This is in addition to the mutual arrangements with nearby other factories for assistance in fire fighting).

d) WITH MEDICAL SERVICES

As much or perhaps of greater inportance is the integration with the local medical and health service. Large chemicals companies have their own hospitals to deal with routine health needs of workers and minor accidents. However, most formulation factories may at best have dispensery (manned by a part-time doctor or paramedical staff) which is inadequate to deal with a major accident. Therefore, the managements of pesticide factories need to closely liase with the local hospital/s to handle serious and emergency cases. For proper integration, the Pesticide factories must inform the hospital/doctors of the following in regard to chemical poisoning and keep them updated of any change -

* The toxicity of the pesticide & other chemicals handled in the factory
* The principal toxicity symptoms of each of these chemicals.
* Antidotes for each of the chemicals.
* Treatment procedure recommended (specific or symptomatic as the case may be).

In case there is no on-site professional medical facilit it is best to establish a procedure of referring the accident cases to the nearest hospital and the case details to be sent alongwith the patent. In the case/s of chemical poisoning, it is highly desireable and recommended to send the antidote along with the patient for timely medical intervention.

e) WITH LABOUR DEPARTMENT

Integration with the department is not only essential as a legal requirement (incl. reporting) but also from the view point of promotion of industrial safety habbits amongst the workmen. Labour department have training materials and facilities to conduct programmes on operational and occupational safety and these must be utilized for training the factory personnel.

f) WITH ENVIRONMENT AGENCY

At the local level the specialists of the Department of Environment or Pollution Control Authority may or may not exist. However, integration with these departments is essential for every pesticide factory for several reasons eg. -

i) The disposal of solid toxic waste/s from pesticide production have to be disposed off safely. Landfill is one of the methods of disposal. However, the location of land-fill sites is approved by the Pollution Control Authority and their approval required for dumping the specific waste.

ii) The liquid effluents from pesticide manufacture need treatment for deactivation of toxic components. Even the treated effluent, however, may not be discharged into river or waterways without the satisfaction and approval of pollution control authorities.

iii) In the event of leakage or accidental large dispersal of toxic chemicals or gases, pesticide formulation units need the support of these bodies to monitor the contamination level and steps to minimize hazard.

Thus, integrations with the environment agencies is critical for smooth operation of pesticide plants.

MANAGEMENT OF INTEGRATION

It is clear from the above that harmonising the on-site safety facilities with those of the local services of the state involves management of an external interface. The operational responsibility of the integration, therefore, must rest with the SAFETY OFFICER of the factory who needs to be sensitive and committed to utilize all the available resources for the safety of the factory and its personnel. Due to the nature of the task, the Safety Officer needs & must receive support of the senior management to establish smooth working relationship with the concerned departments and agencies. To ensure effective management of integration, a proper system of record keeping and reporting to the line management must be installed and periodically updated.

SECURITY IN PESTICIDE FORMULATION PLANTS

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(DR. M.G. SRIVASTAVA)*

Security is not synonymous with safety: It is but one of the components of safety albeit a very important one. Lax security can lead to hazardous episodes in any chemical factory. Given the special toxicity problems associated with pesticides, the importance of security in a formulation manufacturing setup becomes much greater.

Security problems can be man, machine or material related. In broad terms Security types in pesticide formulation industry may be classified as follows -

* Security of plant & machinery
* Security of inflamable solvent
* Security of toxic & other hazardous products
* Security of power and electrical systems

It would be obvious that each of these bear on the safety of the establishment and/or its workers. To illustrate, a major fire or pollution hazard could occur if the solvent tanks are not property secured thereby becoming vulnerable to unauthorised handling or tampering. Similarly, if the highly toxic pesticides stored in warehouses become accessible to uninformed or unlesireabl, induviduals, there could arise cases of harmful exposure or even fatal poisoning. Security system therefore becomes a major concern of the managements in pesticide formulation units. The security tasks are outlined in Annexure I.

SECURITY MEASURES

1. Security of factory Premesis - Security of the entire factory area from tresspassing or mischievous entry is an essential measure. For this purpose, a boundry wall or a fence needs to be built. In either case, barbed wire for fenicing or on the top of the boundary wall is essential to prevent entry of persons or animals in the premises other than through formal enterance route/s.

2. Security of Factory Enterance/s - Official enterance/s to the factory must be provided with steel gates manned by security staff. Such manning must be round the clock and only those persons allowed entry who carry the necessary passes or identity cards.

Factory gate/gates should, as far as possible, be connected by telephone to the administrative/factory office to report any undesireable incident or obtain instruction about the entry of an unknown person.

Another essential duty of security personnel at the gate/s is the frisking of the incomming and outgoing persons and vehicles. Frisking of incommers is required to ensure that no undesireable object is taken inside the factory. Similarly frisking of these going out is to ensure against pilferage including safety equipment etc.

3. Security of plants - Formulation plants involve fast moving equipment, complex electrical circuits, control panels, safety fuses etc. Mishandling of any of these by accident or design could lead to serious accidents, injury or fire episode. Hence, Security of the plant and equipment is critically important. The plant (is locate in properly built structure. Steel gates of the plant building should be properly secured (locked) when the plant is not in operation and manned (by guards for authorised entery only during the work shifts.

Another important security measure in this context is to provide distinctive name/s identity tags to the staff of the plant to ensure authorised entry. (Similarly distinctive tags should be provided to the personnel of other activity areas).

4. Security of Warehouses - Pesticides formulation units store toxic pesticides (and other chemicals) in technical grade or formulated form, often in large quantities. Some of the chemicals involved in the operation are also combustible. Thus, unless properly secured from imporper handling these chemicals could cause accidents

of fire, pollution or poisoning.

Warehouses of raw materials and finished products should be fitted with steel doors and when not in use, they should be securely padlocked. The keys of the locks should be in the custody of the Materials Manager or Plant Manager, as applicable for the individual unit.

5. Security of inflamable solvent/s - The bulk storage of solvents in a formulation factory is a major fire hazard and therefore a security risk area. Carrying sparking tools/motors, lighter/matches or smoking within the sensitive distance from the tank/s or solvent warehouse could cause major fire and explosion. Similarly, mishandling or failure of valves and pipeline could cause major leaks and consequent fire and pollution episodes.

The solvent tank batery must there-fore be protected by a strong steel mesh cage of appropriate size, ensuring good ventilation of fumes.

Its steel doors should be padlocked and opened only in the presence of a responsible officer. Warehouses holding solvents in drums (eg. xylene) must similarly be well ventilated besides being properly secured.

6. Security of Electrical System - Formulation plants often (& substations have their own transformers) as well as complex control pannels, the latter especially in the mixing and packing plants. Transformer rooms are high risk areas if switches or cables are mishandled. Therefore, both the stations need proper security. These stations must be provided with steel doors and locked to prevent unauthorised entry. The keys of the gates should be in the safe custody of the electrical engineer works engineer of the factory and no unauthorised person should be allowed entry.

5.

7. Security of Laboratory - Pesticide Formulation Units have quality control laboratories equiped with sensitive and expensive equipment. These laboratories stock some highly poisonous or inflamable chemical reagents. There are gas generating units in some laboratories. All these are high risk items and call for proper security. The main enterance of the laboratory must be provided with steel gates. The entry into the laboratory should be allowed to authorised invidiuals only. During work hours the entrance should be guarded by a security guard and securely locked during the off shifts.

8. Security of Empties - In pesticide manufacture, an apparently innocuous but high risk aspect is the security of empty containers of toxic pesticides (Tech grade). These may be steel drums or large plastic cans. Since it is not easily possible to completely decontaminate these contrainers, they are often stored in the factory premises until their final disposal. Security is required to ensure that these containers do not get mixed up with safe empties or taken out. Ideally, such containers should be cut & flattened or perforated in the bottom before storing. These empties should be stored in a segregated area provided with barbedwire fence and security gate.

MANAGEMENT OF SECURITY

Like all operational functions, proper security demands appropriate organisation and control (See Annexure II).

Organisation

Large establishements have their own security force comprising guards under the control of a Security Officer. In samller plants eg. pesticide formulation units, the supervisory function is also taken on by the Safety Officer. The security force may be company's own on hired from the security services now common in most countries

The basic function of the security force is watch & ward. However, other functions may be assigned to it. (It is a common pradtice in many pesticide formulation units to use the security guards for fire fighting when needed). The size of the security force (number of guards) relates to the size of the task eg. the size of the premesis, the size of the warehouses particularly the number of locations where hazardous material is stored. (See Annexure I).

Training of Guards

Security personnel have to be provided training to be fully effective. The training programme should include -

a) Nature of watch & ward duty at different stations
b) Dealing with trespassers/thieves etc.
c) Alert observation for any sign of leakage or fire and in case noticed -
   i) To sound alarm
   ii) Take steps to contain leak/fire etc.
d) Reporting of any incident during (his) duty hours.

Periodical Security drills and refresher training programmes are important in this function.

Duty Rota & Record

Security guards are assigned duty by a rota system for different shifts. A rotation of guards at different stations is considered a desireable practice. On this basis, duty charts are prepared and proper record maintained by the Security Officer. This maybe done in a register or shiftwise duty sheets which are later put in a file. The duty sheet/charts (Annexure III) record the name of guard,station, duty period, any undesireable episole during the period (eg. trespass, theft, leakage, fire etc.) and emergency steps taken. The time of incident and the name of officer to whom reported must also be entered in the form. The The duty sheet must be seen and countersigned by the Security Officer.

Enquiry into Security Incidents

Most factories have laid down systems for enquiring into minor and major incidents in the form of standing orders. For major incidents, however, it is essential to establish a code of enquiry with the object to establish the cuase, loss/damage due to incident, establishing security lapse responsibility (if any) and recommendations to prevent recurrance. The enquiry must be followed by suitable reward or purnishment of the concerned security personnel in the interest of discipline and commitment to duty.

The enquiry report is essentially for internal action/s. However, in cases of theft, injury or loss of property, reporting to ploice and civil administration is essential in most countries.

Surprise check is found useful to ensure alterness of guards on duty and is recommended.

Control of Security Personnel

Safety Officer/Security Officer is accountable for the Securit of the premesis and property. Therefore, he exercises administrative control over the security team/guards. Security Officer is also responsible for duty assignments, discpline, enquiry into minor episodes and reporting to the factory management (Executive Director/General Manager). He is also responsible for training of the Security guards & maintenance of records.

Security Guards provide the first interface with outsiders and often unplessant events. Hence, in administring the security force, the management in general and the Security Officer in particular needs to be sensitive but without compromising on the duty and discipline of the force.

Annexure III

SECURITY DUTY SHEET

1). Date ---------- 2). Duty Station ----------

3). Name of Guard ----------

4). Duty Period ----------

5). Name of the Guard Relieved ----------at--------Hrs--

6). Incidents During the duty hours (if any) :

Tresspass/Theft/Leakage/Fire/Any other

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7). Time of incident ----------

8). Incident Reported To ----------

9). Details of the Incident ----------

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10). Name of Relieving Guard ----------at-----Hrs-

11). Signature of the Guard ----------

12). Circulated to and seen ----------
by the Security Officer
(Signature and date). ---------- ---------