

Changes in process safety and risk legislation in South Africa

The Major Hazard Installation Regulations are being amended and are set for promulgation in 2018 at the earliest. Motlatsi Mabaso, CEng, MIChemE, Director: MMRisk, a process safety and risk consultancy, spells out the changes.



A Major Hazard Installation (MHI) facility may be defined as an industrial facility that manufactures and/or stores relatively large quantities of chemical materials, which, if they were to lose containment, would result in effects that could cause harm to personnel and members of the public near the facility. Effects may include major fires, explosions and release of toxic materials that disperse over a distance. Quantity of storage and location of onsite facilities relative to the site fence are the main considerations for MHI facilities, as these have an influence on the effects of loss of containment on members of the public around the facility.

By South African law, governed by the Department of Labour and part of the Occupational Health and Safety Act No. 85 of 1993, every MHI or suspected MHI is required to undertake what is known as an MHI Risk Assessment, which is a Quantified Risk Assessment (QRA) of the facility that considers the potential effects in the case of loss of containment as well as the likelihood of its occurrence.

MHI Risk Assessments are undertaken by Approved Inspection Authorities (AIAs), which are vetted by the South African National Accreditation System (SANAS). The final risk results, which combine effects and

likelihood of occurrence, can be compared against internationally recognised thresholds to determine tolerability for the site under review. The MHI Risk Assessments are required to be updated five-yearly.

At present, a number of stakeholders in the South African MHI industry have difficulty in interpreting and applying the current MHI Regulations. These include confusion around the quantities and types of facilities that qualify for exemption (if any); the definition of 'Impact on the Public'; interpretation of the regulations by the various AIAs; and the meaning of some of the vague phrases within the regulations. Ultimately, the final interpretation and decision-making should be made by the national Department of Labour with assistance from the AIAs as required. Such uncertainty is not good in an important industry whose aim is protecting members of the public from the effects of industrial accidents.

However, a change is coming – the MHI Regulations are in the process of being overhauled with a new set of regulations due to come out in the next 12 months (in the best case). There is also a new South African National Standard (SANS-1461) for the compilation of MHI Assessments being compiled through the South African Bureau of Standards (SABS), as well as a new stan-

dard for Emergency Preparedness for Major Hazard Installations (SANS-1514).

On 27 October 2017, the Department of Labour's (DoL) Explosives and Major Hazard Installations Directorate hosted a workshop to introduce and sensitise industry (operators of MHI facilities) and other stakeholders to the upcoming regulations. On the same day, a story broke about a massive explosion at a fireworks factory in Indonesia leading to a fire that brought down the entire roof of the factory. The incident left 47 people dead, 46 injured and ten initially unaccounted for. There was no more fitting story than that to use as a 'safety moment' at the workshop.

The session began with addresses by officers of the DoL, including Ms Iggy Moiloa, Inspector General and Rachel Aphane, Deputy Director of Major Hazard Installations. Aphane took us through the history of the MHI regulations, comparing the old with the new regulations in both technical and procedural aspects. She described how, in future, terminology will change slightly: an 'installation' shall refer to a process unit or piece of



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equipment on-site, while the entire site itself will now be referred to as an 'establishment' and it may comprise several installations. Other notable definitions included were:

- **Dutyholder:** simply put, this is the organisation that operates an MHE;
- **Licence to Operate (LtO):** Official approval/ consent to operate, based on satisfaction that the Dutyholder has identified and understood all operational requirements to protect the public and workers.

A new approach: low, medium and high hazard establishments

The main changes in these new regulations are the introduction of Hazard Levels and segregation of facilities into Low, Medium and High Hazard and the inclusion of information on the Process Safety Management System (PSMS) of the establishment. Daniel Rademeyer spoke about how one goes about classifying an establishment as Low, Medium and High Hazard, while the author's presentation focused on the new Safety Report requirement for High Hazard establishments.

Classification will be based on the maximum inventory of hazardous material that will be stored on-site. The regulations will contain many named substances and thresholds for consideration as Low, Medium and High Hazard establishments. The following requirements will apply per establishment as far as risk assessment:

Low Hazard Establishment (LoMHE)

1. Quantified Risk Assessment (QRA) and
 2. Emergency Preparedness Plan (EPP).
- For LoMHEs the approach will be very like the current MHI regime, in that the establishment will be required to compile a QRA and an EPP. The DoL will be notified by the Dutyholder of the existence of the LoMHE, with the QRA and EPP accompanying the notification.

LoMHEs are likely to be those storing, for example: between 5 and 50 t of anhydrous ammonia; or between 5 and 50 t of LPG; or between 250 and 2 500 t of petroleum products, eg, petrol, diesel, kerosene and others.

Medium Hazard Establishment (MedMHE)

1. Quantified Risk Assessment (QRA).
 2. Emergency Preparedness Plan (EPP).
 3. Major Incident Prevention Policy (MIPP).
 4. Safety Management System (SMS).
- For MedMHEs the regulations will start to require more: in addition to the QRA and EPP, a Major Incident Prevention Policy (MIPP) and a Process Safety Management System (PSMS) will be required.

MedMHEs are likely to be those storing, for example: between 50 and 200 t of anhydrous ammonia; or between 50 and 200 t of LPG; or between 2 500 and 25 000 tons of petroleum products, eg, petrol, diesel,

kerosene, chemicals and other hazardous substances.

High Hazard Establishment (HiMHE)

1. Quantified Risk Assessment (QRA).
 2. Emergency Preparedness Plan (EPP).
 3. Major Incident Prevention Policy (MIPP).
 4. Safety Management System (SMS).
 5. Safety Report.
 6. Safety Management System (SMS).
- HiMHEs will have the most stringent requirements of all establishments. These will be those establishments storing and handling large quantities of hazardous materials, and as such, those posing the highest risk on their surroundings; the approach for HiMHE is proportional to their risk profile. A Safety Report will be required, which identifies the major accident hazards at the establishment, quantifies their effects and likelihood of occurrence and goes into considerable detail on how those will be managed, including details of safety critical element (SCE) identification, and measures to ensure that the risks are and remain As Low As Reasonably Practicable (ALARP). Accompanying the Safety Report will need to be a Process Management Safety System (PSMS) that implements the MIPP. A QRA, whose main arguments and findings will be recorded in the Safety Report, and an EPP will also be required.

HiMHEs are likely to be those storing, for example: more than 200 t of anhydrous ammonia; or more than 200 t of LPG; or more than 25 000 t of petroleum products, eg, petrol, diesel, kerosene and others. These will include the crude oil refineries and other such establishments.

Exempt establishments

Some establishments will be exempt from at least performing QRAs and compiling EPPs if they store less than the minimum of qualifying substances. These will still have to adhere to requirements for safeguarding the health and safety of personnel as per the OHS Act.

However, when considering whether an establishment is exempt, it will be important for the Dutyholder to consider the "2% Quantity Rule" and the "Aggregation Rule", both of which will be explained in the regulations.

Establishments that were previously (and perhaps erroneously) considered exempt from the MHI Regulations, eg, fuel stations and pipelines, are explicitly included in this new regime. Pipelines, particularly, will be included: those storing flammable and/or toxic materials, cross-country pipelines and those conveying qualifying materials 'across the fence', etc.

The job of local authorities (LAs)

It was clear from questions at the workshop that procedural issues will need to be ironed

out with regards to the approval process of the MHIs and empowerment of LAs. The LAs have more responsibility in this new regime and this should be accompanied by a process to get all municipalities to the same level of competence in terms of interpretation of technical risk assessment information. At present, the bigger metropolitan municipalities can interact better with the technical content within MHI reports than the smaller ones.

The DoL has expressed that peer review teams will be set up for the review of QRA reports, and that there will be interaction between DoL and the LAs. Discussions and clarifications will be necessary between LAs, DoL and the AIAs about:

- Turnaround times for responding to QRAs from Dutyholders.
- How to identify and address issues in the QRA and Safety Reports.
- How the peer review system will work, especially in the case of, pipelines, for example, where the establishment extends over various municipal jurisdictions,
- What guidance the AIAs can/will provide to the LAs.

So, where to?

The steps the process will follow towards promulgation of the new MHI Regulations include:

1. Consultation with the Public.
2. Publishing of draft MHI Regulations.
3. Consolidation of public comments.
4. Presentation of draft regulations to ACOHS – minister's advisory council on OHS matters.
5. Consultation with the state law advisor – including Department of Justice, to ensure alignment with other laws.
6. Approval by the Minister of Labour.
7. Promulgation – 2018 if all goes well.
8. Implementation.

Conclusions

This new MHI regime will put South Africa in a place where we are in line with global best practice in terms of safety and risk regulation. The hazard level approach is likely to result in a system where the approach to safety and risk is proportional to the risk posed by an establishment. It will do away with current practice where, essentially, we approach a crude oil refinery the same way that we approach a small establishment with cylinders of LPG used in the canteen, for example.

All in all, it's a great effort and a much better approach than before. Regulation will require more effort – and will be a little more expensive for Dutyholders – but, at the end of it, we will have a robust system for managing safety and risk in industrial facilities. □