Legal Requirements on Blasting Practices in Malaysia

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A Technical Talk on "Legal Requirements on Blasting Practices in Malaysia" was jointly organised by both Tunnelling & Underground Space Technical Division and Oil, Gas & Mining Technical Division on 8 December 2018 at TUS and C & S Lecture Room, Wisma IEM. The talk was delivered by Ir. Hj. Look Keman bin Sahari and was attended by 33 participants. This article was written based on the topic of this technical talk.

Introduction

With the increasing population and migration of people to the cities, there is a need to find new areas for development projects such as housing, factories and highrise buildings; as well as new areas for construction infrastructure projects such as highways, flood mitigation canals, reservoirs, etc. which may involve excavation of rocks and tunnelling works – either underground or through hill. Therefore, the need to open up more areas is now more urgent than ever, even on hilly grounds or on areas previously considered as not economic to develop.

Hilly grounds are synonymous with hard rock, which may need to be cut down substantially to facilitate the development of new housing projects or for construction of infrastructure projects, such as those as mentioned above. By the same token, underground or through hill tunnels for LRT, MRT and highway projects need to be constructed to facilitate mass movement of the increasing population as well as reduce traffic congestion within the cities. Similarly, deep underground parking basements are needed in highrise buildings for both dwellings and offices to cater for the increasing population. In both tunnelling and deep excavation works, it is inevitable that hard rocks would be encountered and these require the use of explosives to remove them to designed profiles or formation levels. The use of explosives is still the most effective and cheapest mean to remove hard rock and/or hard materials. However, it is essential for blasters or shotfirers to have the right technical expertise learned formally through attending related courses and/or guidance from experienced and competent persons.

Laws and Acts

In Malaysia there are several Laws and Acts that govern the manufacturing, transportation and use of explosives in mining, quarrying and construction industries as well as in tunnelling and underground space developments. These are as follows:

1. Explosives Act 1957; Explosives Rules 1923

2. Mineral Development Act 1994; Mineral Development (Blasting) Regulation 2013

3. States Quarry Rules

Both Explosives Act 1957 and Explosives Rules 1923 are under the jurisdiction of the Royal Malaysian Police. They govern manufacturing, storage and transportation of explosives and issuance of permit to sell/possess/purchase under the Explosives (Rules 74) using Form E and issuance of licence to import, export or remove explosives (Rule 58) using Form C. Both permit and licence are required before a person could purchase and transport explosives to where blasting work is to be performed.

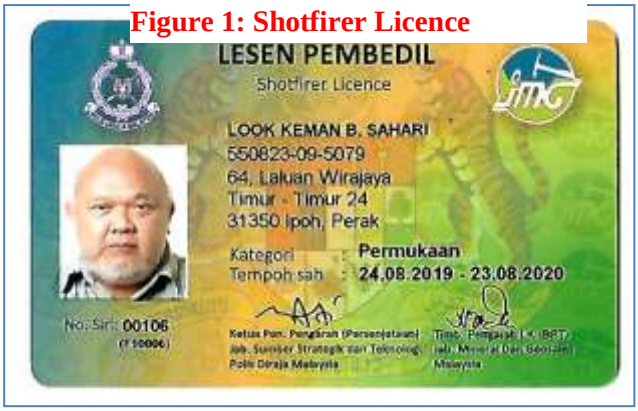

Figure 1: Shotfirer Licence

The Mineral Development Act 1994, Mineral Development (Blasting) Regulation 2013 is under the jurisdiction of Mineral and Geoscience Department or 'Jabatan Mineral dan Geosains (JMG)'. The Laws and Regulations are however only valid for blasting work carried out under mining land. The Regulation governs storage, handling and transportation of explosives within a mining land. There is also a Blasting Certification Panel that validates the qualifications of a person who applies to do blasting work. The Panel is also responsible for determining the syllabus for Shotfirer course and also conducts examination. States Quarry Rules made under the National Land Code, which used to control quarry operation, is also under the jurisdiction of JMG.

The provision under the Mineral Development (Blasting) Regulation can be used as operation conditions under the States Quarry Rules. Under the Blasting Regulation, Shotfirer Licence (*Lesen Pembedil*) is divided into three categories:

a) Surface Blasting (Permukaan)

b) Non-Coal Mines blasting

c) Coal Mining Blasting

Currently the issuance of Shotfirer Licence is only for Surface Blasting. Nevertheless, it could also be used for blasting work in quarries as well as in both mining and construction works. An example of a Shotfirer Licence is as shown above [Figure 1]. The Shotfirer Licence for the other categories may be issued in future when the need arises. Malaysian Shotfirer Licence is actually recognised by our neighbouring countries. Many Malaysians with Malaysian Shotfirer Licences had worked with Singapore MRT project. A few years ago some engineers from Singapore who had worked with Singapore MRT tunnelling project had also attended a Shotfirer course conducted by Malaysian Institute of Quarrying. However, both theoretical and practical examinations sat by these engineers were conducted by JMG.

Underground blasting is normally not part of the Shotfirer course. But basic knowledge learned from a competent Blasting Consultant or engineer is sufficient for the Shotfirer to understand underground blasting techniques. However, foreigners are now no longer permitted to attend the course due to security issue. Shotfirer Licence is issued jointly by both JMG and the Royal Malaysian Police. It is mandatory for a person who wants to purchase and transport explosives to have a Shotfirer Licence. For handling of explosives, the provisions in Mineral Development (Blasting) Regulations could be used as reference or even adopted as part of the standard operating procedures (SOP) for blasting work.

The Shofirer course syllabus was previously based on the British syllabus but had been modified to suit local conditions and requirements. However, with new Regulations being formulated and also with the introduction of new technology, there will be foreseeable revision in the near future to be on par with international standard for all categories of the licensing.

There are other Acts that may also affect blasting operations as follows:

4. Environmental Quality Act (EQA)

5. Occupational Safety and Health Act (OSHA)

6. Local Government Act.

Under these Acts, JMG normally specifies the operational conditions that the project proponents need to comply with such as:

a) Limits of ground vibration and airblast

b) Standard and safe operating procedures

c) Minimum disturbance or annoyance to the public

The project proponent may need local Mining/Blasting Consultants with expertise in explosives and blasting to prepare the Blast Management Plan paperwork for submission to JMG. In Malaysia nowadays, only mining or mineral resources engineers who are Professional Engineers with Practising Certificates (PEPC) are permitted to submit explosives and blasting report to JMG. Similarly, only students studying for Bachelor Degree in Mineral Resource Engineering at University Science Malaysia are permitted to learn the subject.

Blasting work at construction sites for both surface and underground

Blasting work at construction sites is actually under the jurisdiction of the Department of Occupational Safety and Health but at each site, it is under the control of the Safety and Health Officer in-charged. However, the Police and Local Authority may require the project proponents to prepare a project paper on a proposed blasting work for submission to JMG for evaluation as JMG is considered as the expert Department in explosives and blasting. Although JMG does not have the legal authority to oversee blasting works at construction sites, but being the Department with the technical know-how, they are always referred to for consultation as well as for assistance in case of investigation on accidents or complaints received from the public. There were instances where project papers prepared by overseas consultants such as for tunnelling and underground blasting works were referred to the Department for evaluation. However, under normal circumstances, such project papers should firstly, be referred to a local Mining Consultant with explosives and blasting expertise for both evaluation and endorsement before forwarding them to JMG.

Blast Monitoring

Almost all quarries in Malaysia are required to carry out blast monitoring works to ensure that both the vibration level and airblast level are within the approved limits. Whilst there are many suppliers of seismograph in Malaysia nowadays, they do not have the technical knowledge on how to use the equipment properly as well as the blasting knowledge to enable them to evaluate and interpret the results correctly. Currently, blast monitoring techniques and evaluation are not taught anywhere in Malaysia. But, there are many technical papers and videos from the International Society of Explosives Engineers, USA that are available free-of-charge for members. In fact, there are very few engineers with explosive expertise in Malaysia at the moment.

Blasting monitoring is actually needed to protect the project proponent against complaints from owners of properties due to probable structural damages relating to each blasting work. From the readings obtained from each blasting work, the blasting engineers could review the blast design and revise it if necessary, to ensure conformance to the limit imposed by JMG or by the project proponents themselves for the next blasting work. Sometimes, the limit imposed could be very low, especially at highly sensitive localities to ensure minimum annoyance to the public. The keeping of proper records will be extremely useful, if complaints of probable blasting damage go to court for claim of compensation. These include blast designs, blast monitoring records which should include distance from blasting sites/faces, maximum weight of explosives per delay, ground vibration and airblast readings and frequencies. This means that whoever is entrusted with blast monitoring work, he or she must be well versed in both explosives and blasting SOP.

Conclusion

Explosives in most countries are considered as security sensitive dangerous substances (SSDS). Those who need to handle explosives must be competent and also must be free from criminal records. For that matter, anyone who intends to take up a course in blasting shall subject to prior security screening by the Police before they are permitted to do so vide issuance of a clearance letter or certificate. The Shotfirer and the Blasting engineer also need to have Shotfirer Licence as a proof of competency. They also need to continuously stay updated on their technical and blasting knowledge by attending relevant courses either locally or overseas. As for those involving in underground space and tunnelling

works, arrangement could be made with JMG together with the assistance of local explosives manufacturer to conduct drill and blast course. Lecturers could be sourced from JMG itself, explosives suppliers and also from explosives and blasting experts in the industry.

Having in place regular trainings in drill & blast techniques for our local engineers is essential to ensure that there is always a ready pool of local expertises or competent persons with accreditation from both JMG and the Royal Malaysian Police for local and overseas blasting works.

If there are any input or special requirements from the industry, they are most welcome to be forwarded to JMG as an expert Department, for further deliberation and discussion as well as possible implementation.

References

1. Explosives Act 1957 and Rules 1923
2. Mineral Development Act 1994 and Mineral Development (Blasting) Regulation 2013