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Abstract

It has been the policy and practice norm for government of Malaysia since independent day to own all utility facitilies like water, gas, electricity, sewage and telecommunication. In line with international practice and standard, it is preferable for utility providers, installers and contractors whenever possible to install their utility cables and pipes underground. Unfortunetaly until now the so called underground utility policy remains unwritten. Malaysia has instead enacted and use several laws to fulfil the policy gaps. The Street, Drainage and Building Act 1974 (Act 133) is the first general law enacted for utility facilities and followed by other specific Acts which govern other utility facilities like electricity, telecommunications and water supply. All utility agencies providers or installer must adhere to the stipulated requirements of section 40(1) of Act 133 in installing utilities facilities underground. The second limb of the same provision gives the government the legislative power to impose conditions as it deems legally necessary within the law on projects involving utility facilities. Such approach seems to work for quite sometime. However as the nation progresses and the demands of mapping works becomes more complicated, loopholes begining to appear in the provisions of Act 133 regarding utility facilities. The Acts is silent on the requirement to survey and map the precise locality and depth of the installed underground utility facilities. JUPEM has issued rules, guidelines and standard operation procedures in overcoming the legal inadequacies. Although the crafted soft laws are necessary in facilitating the implementation of policies, they do not enjoy the same legislative status or authority as the hard laws. This paper highlights the role of hard and soft laws as policy instruments and discusses the challenges faced by JUPEM on mapping of underground utility in absence of a written policy towards meeting and achieving the international standard.

Keywords: underground utility, mapping, policy instruments, soft and hard laws

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1.0 INTRODUCTION

Jabatan Ukur dan Pemetaan Malaysia (JUPEM- Department of Survey and Mapping of Malaysia) of the Ministry of Natural Resources and Environment is the sole authority for national cadastreal and mapping activities in Malaysia. All matters related to governing and monitoring of geospatial data management falls under its jurisdiction. Initially JUPEM does not have utility or underground utility mapping under its portfolio. Underground utility mapping refers to the detection, positioning and identification of buried utility facilities such as pipes and cables beneath the ground.
The said situation changes by virtue of Cabinet Decisions in 1994, 1998 and 2013 respectively when JUPEM is assigned to take care of survey and mapping works of underground utility. By the same accord, JUPEM is subsequently authorized to compile and manage all underground utility data in the country. For example, Memorandum No. 599/1939/94 from Ministry of Work on 24 August 1994 instructed JUPEM to resolve problems encountered during realignment work of utility facilities in road reserve. The 1998 Cabinet Decision reiterated the requirement to compile and manage the underground utility data under the GIS environment. The Cabinet Directive 2013 is to deal with the frequent disruptions of water and electricity supplies caused by damaged underground utility facilities. These problems occurred during excavation and installation works for new utility facilities or during upgrading or widening of roads. JUPEM first move in discharging that roles began in 2006 with the establishment of the Utility Mapping Section of the Mapping Division before changing to its current name known as Utility Mapping Division (UMD). The UMD is responsible in compiling and managing all utility information for the entire country. The UMD conducts multiple checks on the submitted data for verification purposes first in ensuring they are valid and meet the necessary standards before depositing them with the database repository. For easy management and references purposes, JUPEM took the initiatives in setting up national underground utility database called Pangkalan Data Utiliti Bawah Tanah Kebangsaan or PADU.

Using JUPEM as a case study, this paper focuses on the role of policy instruments in the form hard or soft laws in ensuring government policies are properly implemented and enforced. It shall discuss mainly on the provisions in regard to utility and utility mapping only. This paper shall also highlight how the absence of a written macro or national policy document on utility and survey and mapping of underground utility has somehow practically thwarted the works and visions of JUPEM in delivering the best survey and mapping services towards national progression.

2.0 ANALYTICAL FRAMEWORK

As national authority of national survey and mapping, JUPEM needs to deliver accurate and precise spatial data. In fact accurate and precision in spatial data has become JUPEM's core business and trademark. They reflect the quality and integrity of data set and in turn the worthiness of the data. This is essentially necessary since survey control is usually carried out using global navigation and satellite system (GNSS) and above ground survey by total stations. These data are used to create official and national utility maps or overlays for GIS. JUPEM does not give any exception to any data quality including underground utility for all detected utilities. As far as JUPEM is concerned, failure to provide highly accurate information for underground utility would have equal negative repercussions to the government, public and individuals involved.

The result of digging or drilling in the presence of unknowns, unmarked, unmapped, or incorrect position or location of utilities may cause major damage with physical and economic loss. Inevitably there may be disruptions to utility services. Government continues to see the costs for road repairs soaring due to unnecessary damage in trying to locate the correct site of the installation. The longer the disruptions and the latter is the repair may lead to greater financial loss especially to industries that depend on these services. Failure to address this issue quickly would in the long run undermine the country ability in providing a favorable atmosphere and condition for economic growth. Local government or municipal body would likely impose a higher deposit from utility providers against high risk damages or delay in works. Employers may have to buy insurance coverage with higher premium against fatal or bodily injuries for their workers. There are indeed cases where workers died or suffered bodily injury due to electrocution, collapse of land or drilling machinery.

This situation is attributed mainly to the lack of precise information, inaccurate information on the exact position and actual depth of the existing underground utilities. This happens when utility pipes or cables are relocated during repairs or relocations but there is very little coordination and sharing of information between utility providers. For so long, sharing of information on voluntarily basis is almost impossible. It could only be done when there is a bilateral or trilateral agreement between utility providers and interested parties. Sometimes that information is not updated in the individual’s organization. Even when utility agencies and providers want to update and deposit their data, the same is impossible due to lack of centralized database.
The problems become more acute when the data of underground utility appear in varying styles and independent of any standardized formats. In most cases, the variance in mapping specifications and accuracy requirements between utility providers is largely depending on their plans, purpose and budget. Furthermore the utility providers are under the jurisdiction of different ministries and regulatory bodies, thus are automatically subjected to different guidelines of relevant ministries or industry. For example telecommunication facilities have to abide to guidelines, requirements and specifications of Malaysian Communication Multimedia Commission (MCMC). Whereas water and electricity facilities is governs by the National Water Service Commission (SPAN) and Energy Commission (EC) respectively. It is difficult to gauge the quality of their data on underground utilities since the data are generated using different reference systems and standards of their likings or suitability for own purposes and consumptions. This creates problems to JUPEM when processing and overlaying information of different sources and standards.

Differing understanding and interpretation between parties on the meaning of the term as-built plan adds more problem to the above. Generally there is also a tendency amongst many to perceive design plan as as-built plan. As a matter of formal requirement and procedures, utility providers must submit to the local government, council or municipal body a copy of design plan before any excavation or installation plan could begin. The design plan contains all necessary information on the intended work to be carried out like the layout, position and depth of the utility cable and pipes, before approval for excavation and installation is given. The “as built” plan must be submitted once the job is completed. The as-built plan is firstly for payment purposes. Secondly it would inform the local government the actual layout, positions and depth of the cables and pipes in reality. It is common for local government and utility providers to interpret the design plan to be equally the same as as-built plan. They subsequently accept the submission of the very same design plan before and after the excavation work. The interpretation might be common, correct, acceptable and applicable for construction, building, manufacturing and architecture purposes, where the actual and finished construction work must strictly follow the detailed specification as prescribed in the design plan. Any slight adjustment or correction to the actual work is considered as a deviation from the design plan thus invalid and would be rejected. In other words, there should not be any differences between the intended and actual-finished works thus safe to consider and accept the very same design plan as the as built plan. The actual-finished work is indeed the true reflection of the detailed design plan submitted earlier.

Whereas this might not be the case for underground utility purposes, in certain circumstances, the design plan could be different from the as-built plan. This is because the design plan is only intended to show the design of proposed works plan and the as-built plan truly shows and reflects the actual works done underground. In other words the finished and completed work as shown in the in-built plan could be different from originally specified and indicated in the design plan. There are occasions when the utility providers could not carry out the actual work as specified in the design plan, where adjustments deviations and correction are necessary. This is especially so when they encounter physical barriers or obstacles like tree trunks or huge bedrock, soggy and unstable soil making the identified spots unsuitable for installation of the utility cables and pipes. In that circumstance, it is logical for them to deviate the alignment, re-route the placing spot of cables and pipes a few centimetre away or a few metres in depth from originally intended as specified in the design plan. The practice of treating design plan as as-built plan would inadvertently provides provider or owner of utilities with unreliable data.

JUPEM also faces the issues of discrepancies in data due to data gaps. The gaps commonly occur when the survey and mapping of underground utility are not done during installation or failure to update their data after the installation works are done. They are made worst when utility providers hire unqualified parties to conduct the survey and mapping. Currently, there is no statutory legal requirement for any individuals or organizations to provide an accurately surveyed and endorsed the as-built plan. The above fact strengthens JUPEM’s urge in having professional and licence land surveyor to verify the as-built plan after those installations are done before submitting the same to JUPEM for repository purposes. Without their endorsement there is no guarantee that the utilities are surveyed according to the required accuracies and standards. To date this still happens. In upgrading and enhancing the quality of data, JUPEM has to perform the detection and survey of the underground utilities, incurring extra cost for repeated works!
3.0 METHODOLOGY

The research and writing is qualitative in nature and adopts case study approach. This method is supported by Yin (1994) and considered most appropriate in giving detail explanation of chain of events or phenomena (Winston, 1997) as it allows the exploration and understanding of complex issues (Zainal, 2007). It can be considered a robust research method particularly for social science studies when a holistic in-depth investigation is required (Gulsecen & Kubat, 2006; Grassel & Schirmer, 2006; Johnson, 2006, Stake, 1995). The research uses secondary data in the forms of legal provisions, Cabinet Directives, Ministerial Order, in-house guidelines, standard operation procedures (SOP), journals and books.

4.0 RESULTS AND DISCUSSION

A: Hard law as policy instrument

In Malaysia, basic utility facilities likes gas, water supply, electricity and telecommunication belong to the Government of Malaysia. This has been the policy and norm long before and after independence. Usually these utilities facilities could be found buried underground. However there is no written policy document on underground utility mapping in Malaysia. The above lacking is understandable considering underground utility mapping is a new feature of surveying. Nonetheless it has been five years since the last Cabinet Directives. It is only appropriate for the Ministry to develop and issue a written national policy on underground utility mapping for standardization, harmonization and easy execution purposes towards a more professional services and economic development. In the absence of such policy to direct the long term objectives and strategic planning for utility mapping, JUPEM has to fall back on available legal provisions in performing its daily affairs within the administrative and legal system.

Since 1974, the Parliament of Malaysia has continuously enacted laws to cater for specific or individual utility. Street, Drainage and Building Act 1974 (herein after referred to as Act 133) is the first and so far the main law document that governs matters related to utility facilities. Section 40(1) of Act 133 is the only provision of the Act that states about utility facilities. Naturally all utility providers must adhere to the stipulated requirements of the Act when or during installation of underground utilities.

Under Section 40(1) “no person shall lay or carry any line of rails, mains, pipes, conduits or electric lines along, through, across, over or under any street or any place laid out or intended for a street within any local authority area without prior written permission of the local authority which permission may be granted or not at the discretion of the local authority and upon such terms as it thinks fit”. In summary, utility facilities are subjected to federal and local governments requirements in which they are situated. It is mandatory for all utility providers to adhere to this requirements when or during installation of underground utilities. Utility providers must apply and obtain written permission from local authority before they could begin the work. By the same accord, the local authority has the rights to stipulate and impose any conditions as it deems fit and necessary for the utility providers to satisfy before such permission is issued. Section 40(1) even grants the local authority the right to reject the application from utility providers.

However the Act is silent on the requirement for utility mapping. In the absence of such provision, utility providers are not legally obliged to carry out a mapping survey or mapping to show the final underground location of the utilities pipes or cables. Literally they can excavate, install and bury the pipes or cables anywhere they like, without being questioned or legally punished. In reality many utility providers have indeed taken advantages of the legal lacunea. They have instead chosen not to do so, simply submitted data on the completed installations jobs without conducting the survey or mapping. The above actions simply prolong the old problems and defeat the intention of the government and JUPEM in meeting the international standards or providing a better services.

JUPEM has to rely on the second limb of Sec.40(1) of Act 133 in overcoming the above problems. The second limb of section 40(1) of Act 133 gives government a discretionary power to impose any condition as it deems necessary in a utility project. Local goverment could impose necessary requirements for underground utility
mapping. Local government could demand for utility providers to submit the as built plan. Likewise local government could also stipulate the specific format of the plan, whether it should be in hardcopy or softcopy alone or both. Such information is a good source for up-dating utility data.

Despite the above, JUPEM still faces problems in obtaining the desired data. There is still no legal requirement for utility providers to channel those information to JUPEM for safe keeping and repository purposes for future references. This is the second legal lacunae of sec.40(1) of Act 133.

B: Soft laws as policy instruments

In covering the legal lacunae and inadequacy above, JUPEM has to further rely on other policy instruments. Apart from Statutory Acts or Regulations, JUPEM has been using Cabinet Directions or introduce in-house guidelines and Standard Operation of Procedures (SOP) documents.

Based on the instructions and authorization by the Cabinet Directives of 1994, 1998 and 2013, JUPEM has taken the initiative to produce guidelines and SOP. The objectives of these documents are to force utility providers to execute accurate detection and survey works of existing underground utilities as well as during the installation of new utilities. For example, KPUP 1/2006; Guideline for underground utility mapping describes the roles of stakeholders, quality levels in utility mapping, way of obtaining utility information, deliverables and the national underground utility database (PADU) maintained by JUPEM. KPUP 1/2007; Guideline for utility surveying and detection provides surveyors with the recommended technique and practice for the execution of utility detection for quality level A and B. KPUP 1/2013; Guideline for surveying of new utility installation stipulates the various requirements and surveying procedures for surveyors to follow in installing new underground utility.

The Cabinet Directives 1998 and 2013 empowers local governments and JUPEM to introduce the as built plan requirement. Unfortunately even when utility providers do submit those plans, both directives could not help JUPEM much. The Directives lack the biting effect. They are merely for operative and administrative purpose. It still lacks the legal authority that JUPEM hopes for. As a result, parties are still reluctant and can even refuse to contribute and share data with JUPEM.

Recently JUPEM issued another guidelines titled Garis Panduan Kod Warna dan Penandaan Bagi Pemetaan Utiliti Bawah Tanah. The guidelines provide the standard method in marking and numbering of detected utilities in the field. The idea is to prevent confusion for surveyors in recognising utilities in the later stage during positioning. It also provides the alternative method for marking where utilities are located below grounds other than bitumin roads or concrete.

In the pipeline, JUPEM shall introduce Standard Operating Procedure (SOP) on Penerimaan Data Digital dan Pelan Utiliti Dari Jurukur Tanah Bertauliah (JTB) Oleh Jabatan Ukur dan Pemetaan Malaysia. It describes the processes involved in receiving underground utility data and as-built plan from the utility providers or Licensed Land Surveyors entrusted to carry out surveying on newly laid or installed utility for new projects. This SOP shall complement the recently published guideline by Ministry of Urban Wellbeing, Housing and Local Government called Pekeliling KPKT 7/2014; Garis Panduan Pelaksanaan Pengukuran Ke Atas Jajaran Utiliti Bawah Tanah Semasa Pemasangan.

Despite the issuance of various policy instruments, the above problems keep on recurring, though in smaller numbers now. So where does JUPEM go wrong? The answer lays in the nature of the documents involved (Woollside, 1986). In this context the policy instruments which appear in the forms of directives, guidelines and standard operation of procedures documents are indeed soft laws and not hard laws (Althaus, Bridgman and Davis, 2017; Salleh, 1988). Both types of laws go through a completely different route and legislative process before they could be implemented or enforce (Ahmad Ibrahim, 1978). The route and process for soft laws are obviously much simpler, faster and easier than hard laws (Granville, 1962).

However, soft laws do not enjoy the same legal authority or jurisdictions as hard law (Shaffer & Pollack, 2009). Soft laws at the best could only be regarded as quasi-legal instruments. They do not have any legally
binding force, or whose binding force is somewhat weaker than the binding force of hard law (Hillgenberg, 1999). When hard laws create enforceable obligations and rights for and from all, soft laws are not directly enforceable (Druzin, 2006).

Despite this fact, it is an established legal norm for government universally to accept soft law as part of its administration and system (Christmas, 2007). In many instances, the government is more willing to use soft laws than hard laws since hard laws demand many commitments that might result in national resentment at overcommitting to certain goals (Guzman & Mayer, 2010; Mayer, 2009).

5.0 CONCLUSIONS

JUPEM considers the exercises as a necessity and aggressive steps forward in discharging a better and more professional services to the society and nation. However, in many circumstances JUPEM too has to be satisfied with their limitations of powers, authority and jurisdictions.

The various policy instruments mentioned above clearly lack the legal bites that JUPEM needs in ensuring utility mapping are in order. Unfortunately guidelines and SOP are considered as the bottom two positions in the hierarchy of policy instruments thus not so effective in solving major issues. This explains the recurring problems and why parties choose to ignore the instructions. In this case JUPEM has to use its discretionary powers to positively pursue utility providers to change and abide. In light of the rapid progress in development, there are increasing possibilities for sharing the same right of way and tunnel or for utilities or sharing the same right-of-way, using the same common tunnel or at the same time, networks criss-crossings each other. JUPEM has to organize series of roadshows to help the state and local governments in understanding the guidelines, highlight the importance of underground utility mapping to the country and the needs for data sharing.

JUPEM appreciates the increasing importance of policy instruments in governmental administrative and legal system. However the issuance of piece meal soft laws or amendment existing hard laws might not be a smart move in resolving the existing problems. Ideally it is better to have a proper, structured and holistic national policy on underground utility mapping. Then existing policy instruments must be aligned and modified to support the implementation and enforcement of the proposed policy.

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KPUP 1/2014 Garis Panduan Kod Warna dan Penandaan Bagi Pemetaan Utiliti Bawah Tanah.


Section 40(1) of Street, Drainage and Building Act 1974


