AROUND THE WORLD, INFORMATION ABOUT THE LOCATIONS OF UNDERGROUND CABLES AND PIPES IS GENERALLY POOR, WITH EVEN THE BEST DATA TYPICALLY COMING WITH HEAVY DISCLAIMERS. OTTO BALLINTIJN ARGUES THAT A POSSIBLE SOLUTION IS THE ‘AS-BUILT COMPLIANCE AGENCY’

When planning and installing a new pipeline or cable in an urban area, the primary stakeholders in such a project are the pipeline or cable owner, other utility owners with infrastructure in the direct vicinity of the project, the municipality and regulator, and the contractor(s) performing the work. Not surprisingly the varying agendas of stakeholders is one of the root causes of the generally poor state of locational data of underground infrastructure. In the latter half of the previous century, many authorities allowed utilities to largely self-regulate the manner, format and extent of maintaining orderly and safe operations, including the detail of underground geographic information. As a result, each utility sector pursued its own agenda and usually this meant minimal cost and liability rather than long-term coherent planning.

As underground space filled up, authorities gradually imposed tighter regulations to improve safety and reduce damage. However, regulatory authorities lack the resources to verify compliance. In addition, regulations tend to focus on new installations rather than existing pipelines because retroactive inspection is too expensive and will create competitive disadvantages in liberalised markets, particularly for former incumbent operators.

Despite ongoing efforts made by technology and software developers, contractors, regulators and infrastructure owners, it appears that the past is weighing heavily on defining a transparent and coherent solution for the future. To overcome this legacy issue requires a shift in approach whereby the past is treated separately from the future. Then ‘all’ that is needed is a single entity to administer a coherent and non-discriminatory regulatory framework guiding the collection, qualification and storing as-built data.

Call before you dig
‘Call before you dig’ desks (CBYDDs) have significantly improved the exchange of information between contractors and network operators, but a number of problems remain.

Completeness and guarantees
Desks do not guarantee that their databases are complete and the geographic data exchanged usually contain disclaimers about completeness. This presents an obvious paradox: on the one hand, utility companies do not want their assets damaged yet they are unwilling to guarantee the completeness or accuracy of the information they provide to third parties. One reason for the disclaimer is that their GIS-platforms contain a mix of old, generally poor quality (former analogue) data and new digitally obtained data so the disclaimer is based on the lowest common
data quality denominator. Without regulatory pressure, I do not expect utilities to discontinue this practice – I wouldn't.

**There often is no standard for data exchange**
Modern GIS platforms can solve this problem easily, but all too often contractors treat the obligation of contacting a CBYDD as a tickbox activity required for insurance purposes. Particularly for smaller jobs where the budget is tight, they prefer to dig carefully rather than spend resources on integrating multi-format utility data into one coherent map. I understand the contractors’ reasoning, given the broad disclaimers on the data they receive, because they are liable anyway if they hit another utility, regardless of whether the information received from that utility is grossly incorrect.

**There is no information about abandoned pipes and cables**
Utility operators typically keep records of operational assets. Abandoned pipes and cables are deleted yet usually remain in the ground. Some regulators have recognised this growing issue and remove abandoned pipes and cables, but this is not always possible or desirable. But if they are left, someone should keep a record.

**No GIS**
CBYDDs usually do not manage an integrated GIS-platform. Even if they did, potential accuracy and completeness liability would prevent them from sharing geographic data with third parties. Furthermore, network operators are reluctant to have third parties share their network information amongst each other without their knowledge.

**Local and national projects**
The issue of managing underground data is not new and has been on the agenda of many local and national authorities for decades. A number of cities have implemented plans and processes...
to tackle the challenge, such as the ROADIC system in Tokyo, the JUMP project in Calgary and the GeoCONVAS project in Sao Paulo. National projects include France’s 10-year, multi-billion euro project, which is intended to map all underground utility infrastructure in 3D to an accuracy of 40cm, and the Netherlands’ upgrade of KLIC-WIN to meet the future needs of the industry and be compliant with the national WION legislation and the European INSPIRE standards for utility services.

It is important to realise that national initiatives do not specify how to achieve the directives or who should ensure compliance, whereas the city initiatives are more specific but often too complex and/or expensive for smaller municipalities to implement. In the context of the ongoing privatisation of utilities, it is no longer obvious that the taxpayer should foot the bill for verifying works carried out on (private) utility lines and cables. The principle of “the polluter pays” – or rather “the digger pays” – would be more appropriate.

**The ideal model**

Based on the analysis so far, the ideal model for a transparent, coherent and qualified underground pipeline and cable database must:

- Include all utilities.
- Include live and abandoned pipelines.
- Be available for urban and rural areas alike.
- Be non-discriminatory.
- Have low incremental costs for contractors and infrastructure owners while being virtually free for the municipalities.
- Have technically achievable accuracy requirements.
- Contain a quality labelling system for data entered.
- Have minimum impact on the existing permit structure.

I believe the solution is the establishment of an As-Built Compliance Agency. This agency must be set up as an independent body tasked to implement, maintain, populate and manage a comprehensive GIS platform on behalf of all municipalities.

To enable the agency to begin its activities, it is crucial that minimal changes to the existing permit process are implemented:

- Permits must contain clear and achievable norms for accuracy and format of as-built records. Depending on the installation technique (trenched or trench-less), a norm must be specified.
- As-built information must be presented to the compliance agency for review upon completion of the works.
- Permit holders must submit the location of pipes and/or cables that have been abandoned or will be abandoned as a result of the permitted works.
- Projects are deemed completed only upon issuance of a compliance certificate by the compliance agency.

The compliance agency will set up a server-based GIS platform accessible through a web interface to approved third parties, such as the pipeline owner and municipal officials in charge of public works, so virtually no IT investment is required by users. Optionally, the as-permitted route can be entered into the platform for post completion comparison to the as-built.

Utilities are understandably reluctant to share ownership of their data due to the potential for uncontrolled distribution. But the key legal question is what a party can do with the data, particularly when it comes to making it available to third parties. For work safety, it is not in the interest of authorities to distribute server data to third parties without informing the network owner. The CBYDDs must therefore continue to function as is.

**A modest proposal**

But we need to differentiate between active and abandoned cables and pipes. In my proposal, municipalities will have the most extensive database of abandoned cables and pipes so they are going to be party when a contractor registers a planned work with a CBYDD.

The cost for the participating municipalities is limited to the costs of adoption, which should be more than offset by an increased efficiency in handling permits, while the compliance agency will be largely funded by applicants for the permits through a fee charged for issuing the compliance certificate. Additional income can come from charging to access the GIS. The compliance agency can benefit from advantages of scale as the number of municipalities it serves rises so fees can be kept reasonable and non-discriminatory.

All stakeholders in utilities recognise the benefit of a single coherent method of recording and sharing as-built data of underground infrastructure. Self-regulation has proven to be ineffective so the only viable option to reach the goal is through regulatory measures. Setting up an independent As-Built Compliance Agency is an effective and efficient way to coordinate and manage the implementation of new regulations and to create a database of accurately labelled as-built data while at the same time addressing the growing issue of abandoned pipes and cables.

Will this end the practice of the ‘heavy’ disclaimers on shared as-built? Probably not in the immediate future but as data accuracy labelling increases, there is a good hope that one day the disclaimer can be removed.

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