

## Abstract KLIC the Dutch one call system

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### Introduction

The Dutch have an everlasting struggle against the water, seawater from the North Sea and also water from the rivers entering from Belgium and Germany. In that struggle we have to maintain a balance between the requirements on costs, safety and environment and also balancing the needs from farmers, citizen and many others; we are "poldering" all the time. This "poldering" is also the origin of a system called KLIC, an abbreviation which means cables and pipelines information centre. It is the exchange of information of cables and pipelines since 1967, aiming to prevent excavation damage to our sub soil infrastructure. I will present you that former one-call-system and also the present information exchange. I will explain more extensively our future plans for that information exchange within the context of INSPIRE.

### Domain underground infrastructure

The Netherlands have an enormous underground infrastructure of cables and pipelines. This is for instance a normal residential situation, where you see low and middle-high electricity power cables, pipelines for gas-, oil- and water transport, sewerage and telecom cables. For construction and maintaining these networks as well as for many other purposes there need to be excavation activities. These can lead to excavation damage, like this damaged pipeline for water. Extremely dangerous it becomes when a large pipeline is damaged.

### Brief history of KLIC

After a series of conflicts with road construction companies about damaging cables and pipelines regional utilities in the Dutch province Groningen decided in 1967 to found the first KLIC, an abbreviation for Kabels en Leidingen Informatie Centrum: Cables and Pipelines Information Centre. The one-call-system in some parts of the USA was a model for it.

It was a free service for excavators; the participating managers of cables and pipelines (MCP) financed the operational tasks.

In following years similar foundations came in the rest of the Netherlands.

In 2005 the regional organizations merged into a national foundation.

### Classical process 1967 – 2010

Following continuous digging incidents network operators in the north part of the Netherlands launched a one-call-system in 1967. In the years after this system became nationwide. The method was simple and effective:

- A digger reports KLIC a planned excavation as a request for area information and he got a receipt for that request,
- KLIC sorts out which network operators are involved in the digging area, based on the registered convex hulls of their networks,
- KLIC informs the network operators involved,
- Network operators send their information directly to the applicant, containing: maps with the location of their infrastructure, detail information and instructions for precautionary measures.

The service was free of charge for applicants; in that period it was financed by the participating network operators. In the early years the whole process took at least three working days. In the end it could be reduced to several hours.

### WION Legislation since 2008

A major disadvantage of the "the classical system" was that diggers as well as network operators participated on a voluntary basis. To overcome this in 2008 a law called WION has been adopted. This abbreviation means Law information exchange underground networks. This law obligates all network operators to participate in the system, using a standard information model for registering their infrastructure. Also every mechanical excavation activity must be reported before starting the works and the provided information of the subsoil infrastructure must be used. The Dutch Kadaster is designated to build and maintain the system for digital information exchange, which is named KLIC-online. The Agency Telecom as part of the ministry of Economic Affairs is designated as the regulator and enforcer of the act. There are severe penalties for violating WION to a maximum fine of 450.000 euro for network operators and 100.000 euro for diggers. The system is rate financed; the actual rate is €21.50 per request.

### Facts and figures

Description	Amount
Underground cables and pipelines [km]	1.800.000
Network operators/managers	1.100
Annual notifications (request for info)	4.300.000
Annual excavation work	175.000
Annual excavation damage	35.000
Direct costs from damage [€]	40.000.000
Indirect costs [€]	??

### KLIC-online procedure since 2010

The system of digital exchange of network information is fully operational since July 2010. Like in the previous system there is also one single request for area information of cables and pipelines, now using a web application called KLIC-online. In the actual system the area information is standardized, digital and combined into one delivery. In an e-mail the applicant gets a unique link to a download server for his delivery of the area information.

### KLIC-online area information

Here you see a part of the overview map in the delivery. For every involved network there is also a separate map. Each of these maps is in transparent PNG-format. A network operator can attach some PDF-files, for instance with detail maps and instructions for precautionary measures

### KLIC2020 Future business requirements of the industry

The Industry is positive about the way excavation information and area information is being exchanged since July 2010, both on the legislative side and on its enforcement side. However, the goal to a substantial decline of excavation damage has not yet been reached. The results of a thorough investigation revealed that the Industry needs to improve efficiency by means of an innovative system for information exchange. In addition, network information needs to be easily used in other domains, for example in an early stage of planning and zoning in the public space and in the domain of public order and security.

### KLIC2020 User requirements of the industry

Feedback from the excavation community has also revealed that accurate and reliable subsoil information needs to be ubiquitous (omnipresent), continuously available (24x7), without waiting (near real time), and presented at any location and on any user platform. The information should also include other information such as planned topography, type of soil, ground water level, cadastral boundaries, address and so on. In order to make an analysis and project development plan, the delivered information needs to be analyzable and inter-operable with third parties systems. The Industry demands a controlled process in case of excavations with authenticating applicants, registering their requests and specifying the digging purposes. The applicant's profile and intended use will determine the level of authorization.

### What about INSPIRE?

INSPIRE is a European guideline which is anchored in the legislation of the member states of the European Community. The goal is open and standardized European Spatial Data Infrastructure. INSPIRE is an abbreviation of Infrastructure for Spatial information in the European Community. It focuses on some –abilities: find ability, availability and interchangeability of standardized digital spatial information from governmental organizations related to environmental issues across the borders of the member states.

### INSPIRE – Themes

There are 34 themes divided over 3 annexes. The themes in annex 1 and 2 are basic and the themes in annex 3 relate more to applications. There are 3 subthemes in theme 6 from annex 3: governmental services, waste facilities and the subtheme that is relevant for these research utility services.

Normally the data ~~for every theme is kept~~ at the source, and is ~~provided~~ to users with view and download services. ~~These services can be outsourced, for instance to PDOK, an abbreviation of Public Service on the Map. The principle of disclosing the data is Publish – Find – Combine: The keeper of the original data publishes his metadata (i.e. information about the containers of data) in a central library, a national portal; for the Netherlands that is the "Nationaal Geo Register". A user of the dedicated portal can use the metadata to access the datasets and combines them.~~ The intended result is that by viewing several dataset in the same time a combined picture is obtained in the view services. After downloading these data can be used offline to make analysis of to combine it with other datasets.

One of the 34 themes of INSPIRE includes Utility Services. The directive implies that about 800 out of 1000 Dutch network operators are INSPIRE-mandatory. End of this year the involved network operators must publish their metadata on the national portal and have their webservices operational with the data as is. By 2020 the data should be harmonized with de European data model. The quality demands are high. Under normal circumstances, which is at least 90% of the time:

- 24 x 7 availability with an uptime of 99%
- Response time for the view-service must be under 5 sec
- a download request must start within 20 seconds
- at least 20 users must be able to request the view service in the same time

The network operators now face the problem how to implement INSPIRE US within this planning and without too much investments and trouble. Implementing INSPIRE Utility Services each on their own would implicate huge costs and an information exchange parallel to the actual Klic-online. The area information would also be incomplete, because only governmental network operators are INSPIRE-mandatory, Telecom networks for instance are ruled out.

### Rich pictures: points of view

Now some brief results, beginning with the views. In this rich picture the points of view of the sectors in the industry are represented with traffic signs in a highway. In the middle you see the white sign with diagonal stripes meaning the end of foregoing restrictions. The excavators and a part of the network operators want to put an end to restrictions which are built in the regulations and in the system. The interviewed scientists and GEO-ICT/technicians are represented with the sign of a highway. They foresee a system with much more speed and possibilities. The municipalities are represented with the traffic sign with 2+1 lane, indicating that they want to use the area information in planning and zoning. The network operators who manage big pipelines don't want civilians to use the system which is represented with the sign prohibited for walkers. The network operators that control pipes with dangerous content want every user of the highway to stop before entering. The telecom and water sectors of the network operators are apprehensive, anxious to deliver network information in vector format but they very much want to receive it for their own planning and zoning. This is symbolized with the one-way-sign, prohibited to enter. The legislators support the highway thought, but the ministry of Economic Affairs prefers that the users of the service pay for it in a rate system, symbolized by the sign of the toll road and the ministry of Infrastructure and Environment has only one major demand: implement INSPIRE US symbolized by the European flag sign. The Dutch Kadaster is willing to service the system, symbolized by the Park and Rail sign. At last the agency telecom as regulator and enforcer in the service wants to monitor the whole process symbolized by the sign of section control.

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