

ONLINE-CONTROL OF HAZARDOUS WASTE TRANSPORTS ON THE ROAD WITH IPA-KON

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SUMMARY: Since April 2010 only electronic documents are utilized in the German control system for hazardous waste transports. A solution had to be elaborated to enable the inspectors of hazardous waste transports to have access to electronically stored information at the waste authorities in order to verify whether the transport is legal or not. Because of the close co-operation of the Federal Office for Goods Transports (BAG), the State Agency for Nature, Environment and Consumer Protection North Rhine-Westphalia (LANUV) and the Information Coordinating Office Waste (IKA) the web-application IPA-KON delivers the necessary information stored in the 16 ASYS databases of the federal states and is easy to operate by the end-user. IPA-KON is operated on mobile laptops having access to UMTS. Data security is guaranteed mainly by the operation within the secure authorities' networks. Besides the ASYS information IPA-KON provides also additional information being useful in special cases. The extension of IPA-KON for transfrontier waste shipment is planned.

1. INTRODUCTION

1.1 The German system for the supervision of hazardous waste transports

In compliance with the European regulation 1013/2006 on the shipments of waste the German Ordinance on Waste Recovery and Disposal Records stipulates two kinds of documents relevant for the transport of hazardous waste:

- The waste disposal record:
The German waste disposal record for national hazardous waste transports is equivalent to the European notification document for transfrontier waste shipments. It will be issued before the transport takes place and is valid maximum 5 years.
- The consignment note:
The German consignment note for national hazardous waste transports is equivalent to the European consignment note for transfrontier waste shipments. It accompanies the whole transport from the waste generator to the waste treatment facility.

In Germany the 16 federal states (the "Länder") are responsible for the implementation of waste legislation. This means that in the field of waste management there may be slightly

different implementations in each state. But the basic procedure for the management of the documents is the same all over Germany. In case of the consignment note this means to have 6 copies in order to participate the authorities responsible for the waste producer and the waste management company, the waste producer, the waste transporter and the waste management company.

1.2 Introduction of the electronic procedure

The high number of hazardous waste transports on the one hand and the decreasing capacity of public authorities to control hazardous waste transports on the other hand were the main reasons to stipulate in the German Ordinance on Waste Recovery and Disposal Records from 2006 the substitution of the paper documents with an electronic control system. In fact only with the help of an electronic control system it is possible to effectively control the big number of hazardous waste movements in a highly industrialized country like Germany. From April 2010 on all new documents will be only available in electronic format.

In order to switch to the electronic procedure all states agreed to use the same IT-system ASYS. Though the software is the same in every state exists a separate ASYS database. In Germany there is no central database containing all information on waste transports from all states.

The 16 states agreed to co-operate closely in order to manage the electronic control system on hazardous waste transports. An agreement of all 16 states to commonly manage and finance this system was elaborated (= GADSYS). In the northern state Schleswig-Holstein the common Information Coordinating Office Waste (IKA) was created managing the control system in charge of the 16 states.

2. THE IPA-KON PROJECT

2.1 The start

While in the years since 2006 there has been a lot of effort to install an electronic control system one fragment was neglected until 2008: how is the control procedure on the road when a supervision authority wants to control whether the transport is in accordance with the legal provisions? In which way will the inspector be able to get the electronically stored information in the 16 ASYS databases of the federal states? Will the driver offer the electronic information via CD or USB-stick? Will he be obliged to have a laptop or PDA on board in order to display the valid documents? In 2008 it was decided to elaborate a solution for this problem. Funded by a national e-government programme of the Federal Ministry of the Interior the IPA-KON project was initiated with the following main participants:

- the Federal Ministry of the Interior as donator,
- the Federal Office for Goods Transports (BAG) as future user,
- the Information Coordinating Office Waste IKA as client,
- the companies Tauw GmbH and Consist ITU Environmental Software GmbH as contractors,
- the State Agency for Nature, Environment and Consumer Protection North Rhine-Westphalia (LANUV) as project leader.

2.2 User, contents and data sources

There are different competent authorities for the control of hazardous waste transports in Germany: on the national level the BAG and on the state level in some states waste management authorities, in other states the police and in some states both police and waste management authority.

Within the framework of the project it was not possible to involve all authorities being competent for the control of hazardous waste transports. But at the beginning of the project there have been intensive discussions with a couple of authorities in order to find out the necessary requirements for the information system that had to be elaborated. The main objective of the project was to elaborate an electronic control system in order to enable BAG from April 2010 on to have access to the electronically stored information on hazardous waste transports during control procedures on the road. Furthermore the electronic control system should be capable to be utilized also by other waste supervision authorities like regional waste authorities or police.

The big advantage of elaborating IPA-KON firstly only together with BAG was the nationwide uniform IT-system and the equipment of all BAG control vans with laptops and powerful and secured UMTS-routers (UMTS = Universal Mobile Telecommunications System).

The relevant data for the control of hazardous waste transports are stored in ASYS: the waste disposal records. Due to the specific regulations of the National Ordinance on Waste Recovery and Disposal Records the information of the consignment notes is not yet stored in ASYS when the transport is carried out. Only maximum 10 days after the waste management facility accepted the waste the consignment note has to be signed electronically and only then this information is available in ASYS. Therefore the transporter has to carry with them all the information contained in the consignment note and is obliged to make it visible to the inspector during a control. In many cases this will be the consignment note as a paper or in some cases also stored in an electronic device. The inspector has to compare the information from the consignment note with the waste disposal record in order to verify whether the transport is legal or not.

Besides this ASYS delivers also information on the waste producer and the waste management company. Moreover it is foreseen to provide information about contact persons in the competent authorities. This feature was a requirement by BAG. For the inspectors during a transport control it may be helpful to have an actual list of contact persons in the waste management authorities in order to ask for additional, special information.

IPA-KON delivers also additional information which might be helpful in individual cases. From the information platform waste characterization IPA the following information sources can be accessed:

- the database realized by the federal state Hesse providing additional information on waste types, among others waste pictures (http://www.hlug.de/medien/abfall/abfall_client/index.html);
- the so-called waste fact sheets from IPA (<http://www.abfallbewertung.org>) providing comprehensive information on specific waste types in a short form.

It will be also possible to easily link to other information sources provided by other states, but presently no such link is realized.

2.3 The IT-concept

IPA-KON is a browser-enabled web-application being available on a laptop via UMTS-connection. The necessary infrastructure is provided for by BAG. IPA-KON has to have access to the 16 ASYS databases of the federal states, to IPA, to the waste information system AIDA from North Rhine-Westphalia and to the waste transport database in the state Hesse. With the exception of the waste transport database from Hesse all information systems are located within

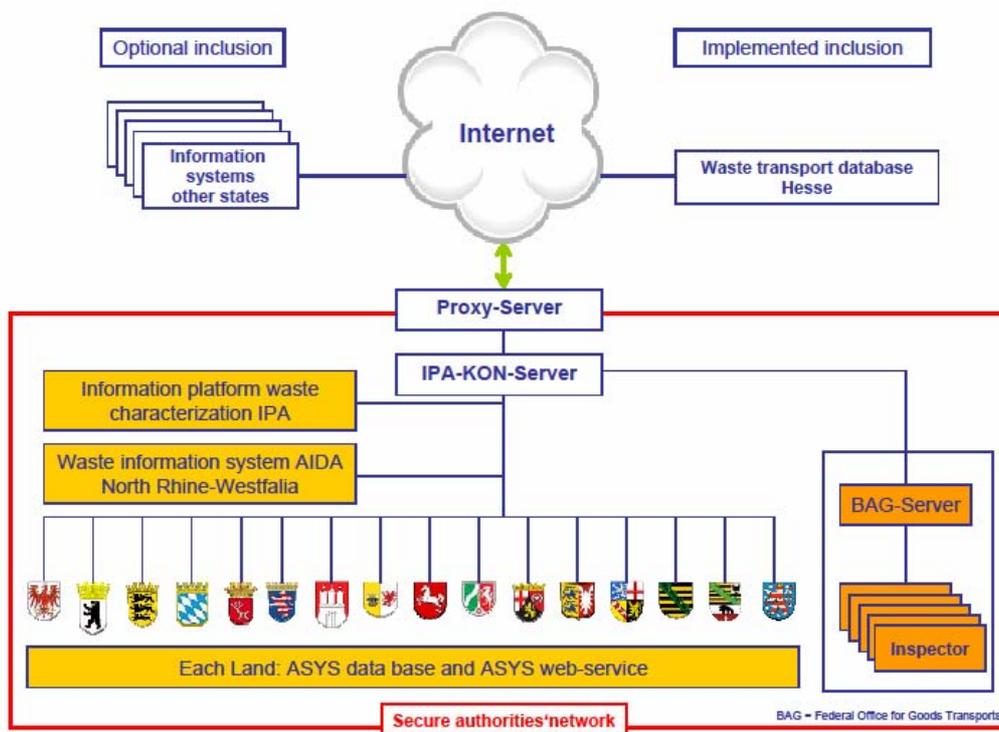


Figure 1. The IT-concept of IPA-KON

the secure authorities' network. Each state has its own state authorities' network and all these networks are linked via DOI (= Germany online infrastructure). The BAG inspectors have with their laptops a secure connection to the BAG-server. This server is linked within the DOI-net to the IPA-KON-server.

The connection between the IPA-KON-server and each ASYS database is realized by web-services which are installed in every ASYS database. The electronic request from a controlling inspector on the road is transmitted via web-services from the IPA-KON web-server to the respective ASYS database in one of the 16 federal states. As response the information from the waste disposal record is delivered to the inspector. If more than one state is involved in the hazardous waste transport the IPA-KON web-server collects the necessary information from all involved databases.

The IT-concept is based upon the operation within the secure authorities' network. This is ideal for the parties involved until now. But police IT-systems are operated in a separate network because of security reasons. When police wants to utilize also IPA-KON a secure connection to the authorities' network has to be realized, a challenge that most probably will be resolved.

2.4 Data security

The information stored from the waste disposal records is very sensitive and because of this IPA-KON has to guarantee data security. The following measures are implemented:

- data transfer within the secure authorities' network
- authentication of the user

- secured web-service

The default configuration of the web-service is to deliver all information contained in the waste disposal record. But the states have the right to individually programme the web-service in order to retain specific information.

2.5 Organisation and administration

In order to enable the link between the different state authorities' networks via DOI it is necessary to unlock in the firewalls the individual IP-addresses of the computers involved in IPA-KON. Basically this procedure is very simple but in reality things are a bit more complicated. Firstly it is necessary that a waste management authority communicates with an IT authority. The bigger the state and the more anonymous the authorities are this already may create some problems. Besides this sometimes exist other bureaucratic obstacles: e.g. in North Rhine-Westfalia the unlocking of the IP-addresses has to be applied for via the Environment Ministry at the Interior Ministry where a special council with members from different authorities finally approve the procedure. In other words: though the procedure itself seems to be simple it may create some bureaucracy.

The contents of all information systems involved in IPA-KON has to be actual:

- **ASYS**
The different state authorities are responsible for the timely proof of the electronic waste disposal records. In this respect the electronic procedure means a big advantage to the former paper procedure. The state authorities are also responsible to care for actual information about the contact persons in the waste management authorities.
- **The waste transport database from Hesse**
This database started only at the end of 2009 and there is still some need to provide as much information for different waste types as necessary. The database provides among others waste pictures. (http://www.hlug.de/medien/abfall/abfall_client/index.html)
- **The waste fact sheets in IPA**
Though the first fact sheets had be elaborated only in 2008 IPA presently (May 2010) contains 26 fact sheets to 186 waste types. The fact sheets have been mainly elaborated on behalf of the states Baden-Wurttemberg, North Rhine-Westfalia and Saxonia. (<http://www.abfallbewertung.org>)
- **The waste information platform AIDA**
This information system is now operated since a couple of years by LANUV and is updated permanently.

2.6 The pilot phase

Until July 2009 the web-application had been programmed and there had been tests with dummy data. From July to November 2010 IPA-KON was tested within a pilot-phase by BAG under real conditions. Since July IPA-KON had the connection to the 3 ASYS databases of the states North Rhine-Westfalia, Hesse and Schleswig-Holstein. At 6 control dates on highways near or within the boundaries of the 3 participating states IPA-KON was tested. The following points have been remarked:

- At the beginning there have been problems to run IPA-KON on the BAG laptops. Some special settings in the software used by BAG had to be adopted.
- IPA-KON works good if there is HSPA or UMTS available at the control point. With lower transmission rates (EDGE or GPRS) the application still works but much slower.

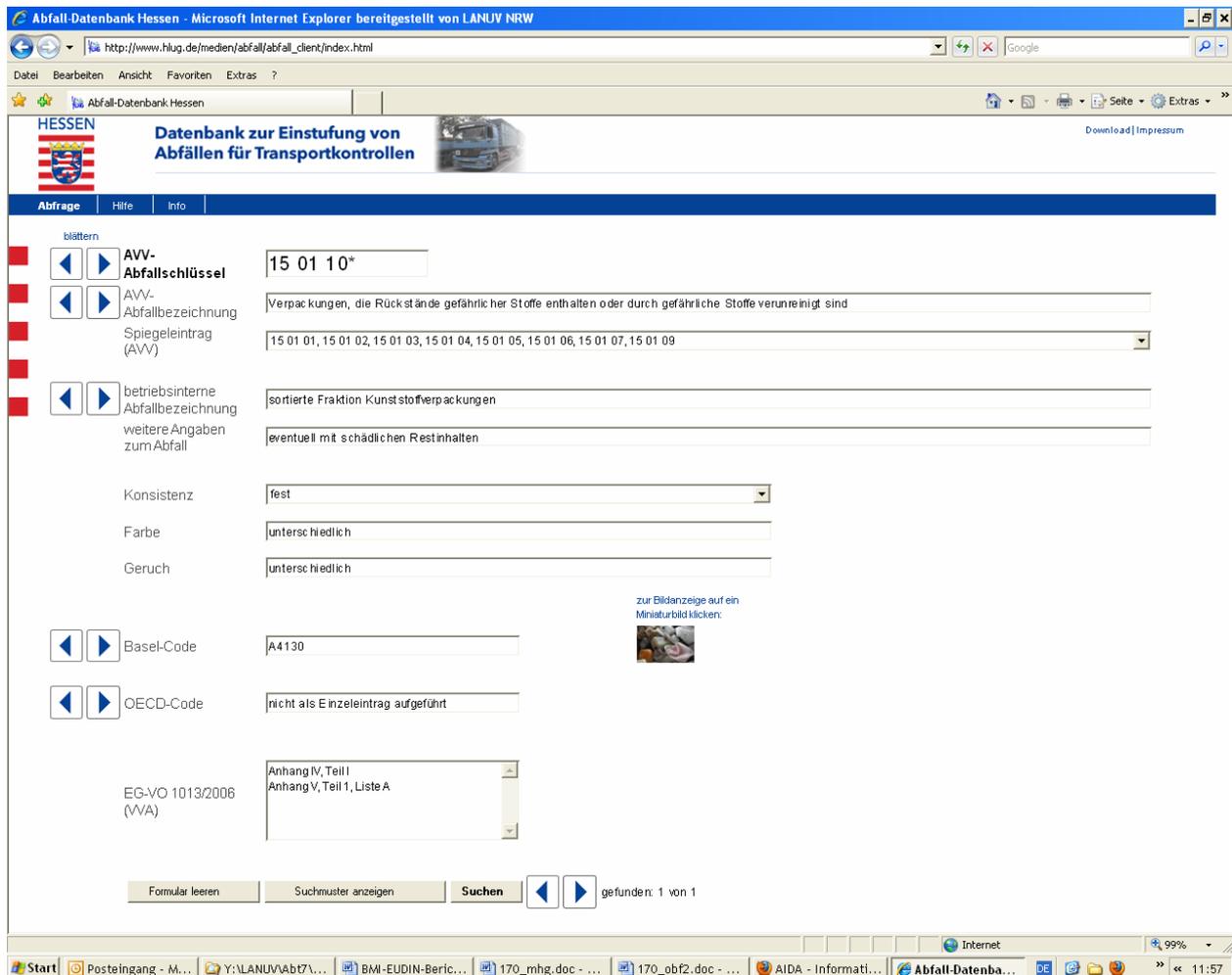


Figure 2. The waste transport database from Hesse

- The requests and the web-service had to be modified slightly in order to optimize the operation of IPA-KON. The search mask of IPA-KON was optimized as well.
- It turned out that in some cases the data sets in the ASYS database have not been complete. In each state there is a different data quality depending mainly on the personal capacity in the respective authority. It is the first time that one nationwide application utilizes the ASYS data from all states, showing the different levels of administration in the states.
- The inspectors wished to have additional information:
 - information on transfrontier waste shipment,
 - information on the transport approval,
 - information on actual certificates for specialised waste management companies.

2.7 Implementation

The Federal Ministry of the Interior funded only the elaboration of project and not the operation of IPA-KON. The BAG as first main user and the 16 states are financing the operation costs. It was agreed that BAG on the one side and the 16 states on the other side will split the costs. During the pilot-phase the IPA-KON-server was located at the LANUV. With the end of the pilot-phase and the beginning of the operation-phase it was foreseen to install a server at the IKA in Schleswig-Holstein where IPA-KON will run in the future. Only when the IPA-KON-server will be installed at IKA it is sensible to install all the necessary secure connections between the IPA-KON-server and the 16 ASYS databases. As explained before for each computer involved in IPA-KON and being located outside the authorities' network where the IPA-KON-server runs

it is necessary to unlock the IP-addresses in the firewalls. This has to be done only once and later only if there are changes of the IP-addresses. But because this procedure means some bureaucratic efforts it is sensible to realize it only when the IPA-KON-server is at its final location.

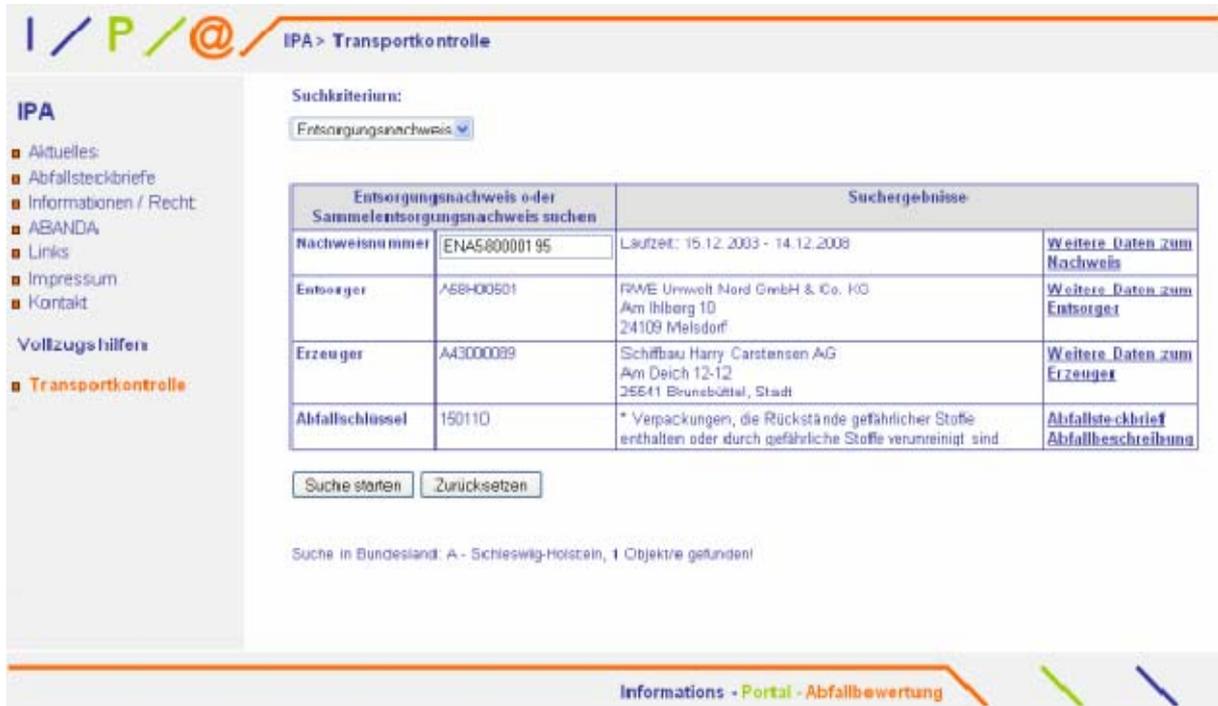


Figure 3. The main search mask of the web-application IPA-KON

3. THE EUROPEAN PERSPECTIVE: EUDIN

Already since 2002 the four states Austria, Belgium, The Netherlands and Germany co-operate in the EUDIN project in order to create an electronic control system for transfrontier waste shipment. Based on the jointly elaborated EUDIN-interface Germany implemented software to be used by the German competent authorities. The EUDIN information is stored in the same databases as the ASYS information from the national transports, forming a separate part in the jointly utilized database.

Besides the 4 member states already co-operating in EUDIN exists in the Scandinavian countries a joint initiative for the elaboration of an electronic procedure for the control of transfrontier waste movements. Also in other member states there are at least plans for an electronic control system of hazardous waste transports.

In a planned project we intend to extend IPA-KON in order to have also access to the EUDIN information. The objective is to enable the waste inspectors on the road to both control national and international waste transports.

Hopefully after a successful implementation of the extended IPA-KON this electronic system might be the germ cell for a European electronic control system making the control of transfrontier waste movements more effective.

ACKNOWLEDGEMENTS

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