BIG Kosmos: a cosmos of chemical information

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(revisited by Johan Broeckx)

1. Who we are?
BIG was founded in 1979 as a support center on dangerous goods to provide information to fire brigades when confronted with incidents involving chemicals. Today we are a highly qualified knowledge center on dangerous goods with clients that vary from governmental institutions, emergency services, SME’s and large multinationals from all over the world. As an emergency center BIG can be reached 24 on 24, seven days a week. We provide training and consultancy, but also tailor-made solutions in allowing companies to be compliant to regulations related with dangerous goods. Currently our BIG team consists of a highly trained staff of 44, all experts in different fields ranging from transport regulation, REACH and CLP, toxicology, ecotoxicology, database development and so much more. (www.big.be)

2. Feeding BIG Kosmos
The heart of BIG is a cross linked database containing information on more than 50 000 substances and mixtures. The database is multilingual and per product file more than 2000 properties can be entered. The data can be accessed through different parameters such as CAS No., EC index number, formula, … and through about 600 000 synonyms. In order to feed the database information is gathered, evaluated and validated through an ISO certified quality system. The strength of the database is that all information as well legal as coming from client or other literature sources is linked on substance level. The database is structured in a way to allow for easy extractions of the data in order to integrate them in management systems like SAP-EH&S. In order to be able to do this every single item in the BIG Kosmos is coded and linked to an extensive library of language catalogues containing standardized sentences. This allows for easy translation and consistency in the wording of hazards, risks, measurements, …

2.1 Literature study
Before a substance or mixture can be added in the database a full literature study is performed by BIG to gather, evaluate and validate the relevant data on that substance or mixture. In the procedure several double checks are included to be able to guarantee a high level of quality of the data eventually being put in BIG Kosmos. In figure below you can see the flow of how a literature study is performed:

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2.2 Updating Kosmos

One of the difficulties in maintaining a database is keeping the data up-to-date, especially when dealing with crucial information as is present in the BIG Komos. Whenever legislation changes, criteria change, classifications are amended it is important that these are also as soon as possible realized in BIG Kosmos and distributed to our various users. This is in particular challenging since most legislation is published completely in HTML or PDF-files. In some cases IT can provide an outcome, but in some it is plain human labor that has to deduce all information from the legislation and adapt it to a format that can be implemented in BIG Kosmos.

The format has to allow for an easy way to check and compare the different versions (updates) of legislations. BIG therefore tries to create standardized structures and procedures to handle updates of country dependent and other relevant data.

3. Output

With the BIG Kosmos as heart of our system we can provide different products and services for our users. A highly valued output of the BIG Kosmos is the BIG Kaleidos, a yearly extraction of the mother database that is issued out every year containing information on 20 000 substances and mixtures in 13 languages. The selection of the substances for the BIG Kaleidos is done based on the high volume list in combination with the substances that are enumerated in the ADR with UN number.

Listening to the needs of our audience we also developed a limited version of this; limited in the set of substances, the data and languages. We also released a mobile version on pocket PC or windows mobile phone that is very much appreciated by intervention services like fire men or first responders in general. We are now developing a web based solution of this application as well to be able to accommodate all operating systems.

On request of the first responders we also developed an intervention card for the 1080 most common substances (most dangerous and those most commonly used and transported) and published those in a book. For industry we developed and published a similar bookwork where the card is adapted to the needs of occupational safeguarding, meaning that it contains clear pictograms and guidelines for the people on the floor. The fact that BIG has its own IT department allowed us to offer these things also in an electronic form through DDS. DDS stands for Document Distributing System and is a web application to allow companies to manage and distribute documents.
BIG stands true to its core business and therefore focuses on quality data on chemical substances and mixtures. We acknowledge that there are several high standard EHS management systems on the market to make life of the EHS manager easier, like the EHS module of SAP. However each of these systems is dependable on the data put into the system to be able to guarantee a decent output and here often lies the problem for the EHS manager. Not only is putting in the data a very time consuming affair, but he is also depending on the information provided by its suppliers. It is no need to say that often this information provided is unclear, inconsistent or not up to the standard required. Here BIG can help. The data structure of the BIG Kosmos is mapped to the data structure of the system, the user can select clusters of substances that he wishes to add to his system and the data is uploaded. The number of updates a year can be set in accordance with the needs of the client.

BIG also provides tailor made finished documents for clients like product safety cards or Safety Data Sheets.

4. Safety Data Sheets

SDS’es or Safety Data Sheets have since long time been the ideal tool to communicate on the hazards of the chemicals used and how to need to handled by industrial and professional users. Unfortunately studies showed that the majority of SDS’es were not up to standard. Therefore when introducing a whole new Regulation concerning chemicals it was decided to also add new guidelines on how to draw up an SDS. So in the REACH Regulation No. 1907/2006 Annex II describes in detail what needs to be in the 16 sections of the SDS. Meanwhile the UN developed the Globally Harmonised System for classification and labeling of chemicals or GHS. GHS was developed to work away the differences in classification in the different parts of the world. The UN text consisted only of guidelines that needed to be implemented in the different legislations around the world. The EU implemented the GHS via Regulation No. 1272/2008, also known as the CLP Regulation. In order to incorporate CLP and the extra data generated by the REACH Regulation in the form of exposure scenario’s into the SDS, EU issued out Regulation 453/2010 amending the Annex II of the REACH Regulation.

At BIG we specialize in drawing up Safety Data Sheets conform the EU regulations. The new regulation offers plenty of challenges. BIG has developed a template and export tool to draw up extended SDS’es for Pure substances and mixtures. The challenges not only lie in the vast quantity of data that needs to be on the SDS, but also the complexity of the data and the need to tackle the differences in the data depending on the source. For instance the classification of a substance now cannot be taken from one single source anymore, since through the obligations in REACH new data is discovered or generated through studies and tests, which needs to be taken into account when evaluating what is delivered by the supplier or what can be found in the list of harmonized classifications in the regulation.