

National QAQC study for DIOXINS in JAPAN

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Introduction

Polychlorinated dibenzo-*p*-dioxin and related compounds have received nation wide attention for the past couple of decades in Japan. This may be due to tragic national experiences of suffering from various environmental disasters such as Kanemi disease and Minamata disease during the last five decades. The Environmental Agency of Japan started a nation wide monitoring survey of dioxins several years ago. Various regulations were imposed to control discharge of dioxins in wastes, especially in flue gas from the incineration process. Because of the high cost involved in the trace analysis of dioxins in samples, various laboratories were established in Japan and started to analyze dioxins in a variety of samples. As the result, there are nearly 200 commercial/academic laboratories are established for dioxin analysis on a commercial scale in Japan. As most of these companies have started dioxin analysis in the last few years, quality assurance and quality control (QAQC) measures have become an important issue to carry out reliable risk evaluation of dioxins in Japan.

Considering the above situation, to ensure accurate measurement of the trace levels of dioxins, the Measurement Law was amended by the Japanese Government in June 2001. This means that every company that performs measurement of dioxins and certificate it must obtain accreditation from the Accreditation Body after April 1st, 2003. Corresponding to the amendment, Specified Measurement Laboratory Accreditation Program (MLAP) was introduced in Japan in April 2002.

What's MLAP

MLAP is an accreditation system that was newly introduced with the amendment of Measurement Law of Japan in June 2001 in order to enhance the reliability of certification and measurement data on the trace levels of substances such as dioxins. By the introduction of MLAP, any laboratory performing business of certification and measurement of dioxins, etc. can apply for MLAP accreditation to National Institute of Evaluation and Technology (NITE) and then be accredited as an "accredited specified measurement laboratory".

Its worth to mention that "DIOXINS" subjected to MLAP include all 2,3,7,8 substituted isomers of polychlorinated dibenzo-*p*-dioxin and polychlorinated dibenzofurans (tetra to octa chlorinated isomers) and total amount of other congeners (*e.g.*, total tetra CDD, penta CDD, hexa CDD, and so on). Other "DIOXINS" also include non-*ortho* and mono-*ortho* coplanar PCBs (only 12 isomers). In other words, tetra to octa-chlorinated CDDs and CDFs, and non-*ortho*/mono-*ortho* coplanar PCBs are considered as "DIOXINS" in Japan.

Applicant/laboratory interested in obtaining accreditation from MLAP must pass an examination based on ISO/IEC17025. The process of MLAP is shown in figure 1. Application to MLAP must include enough information about the company and they have to provide enough evidence of QAQC. After passing the qualifying examination and on-site inspection, company can start their business but must renew their license every three years.

FUTURE PERSPECTIVES

As of April 20, AIST and NITE have completed the examination/certification of more than 120 companies and about 70% were accredited by procurator of Ministry of Economy, Trade and Industry (METI), Japan. It was made clear that simple technical testing for HRGC-HRMS measurement of a standard solution containing 17 isomers of 2,3,7,8-substituted PCDDs/PCDFs was effective screening method to eliminate unskilled laboratories/concerns. For example, without adequate maintenance of capillary column, bad resolution of individual isomers, lack of use of calibration curves and standard operation protocol were found in not accredited laboratories. As a follow-up to the first accreditation, proficiency testing will be performed to all the laboratories before the renewal of license based on ISO/IEC GUIDE 43-1 (1997). This proficiency testing is not only for checking interlaboratory comparisons using robust statistical techniques, but also accuracy of measurement methods and results. The latter point is difficult to exam by using general testing item for dioxins because it's only composition standard made from environmental matrix. AIST started to develop new testing item based on the idea to evaluate each step of clean-up and instrumental measurement of dioxin. Efficient proficiency testing for National QAQC study on dioxins analysis is expected in near future.

Chronicle of MLAP

Measurement Law amended on June 20, 2001 extract
Cabinet Order concerning Effective Date of Law Amending the Part of Measurement Law enacted on September 5, 2001)

Cabinet Order concerning Measurement Law (enacted on September 5, 2001 extract
Fee Order concerning Measurement Law (Amended on September 5, 2001 extract

Cabinet Order
Cabinet Order concerning Effective Date of Law Amending Part of the Measurement Law enacted on September 5, 2001)

Cabinet Order concerning Measurement Law (enacted on September 5, 2001) extract
Fee Order concerning Measurement Law (Amended on September 5, 2001) extract

METI Ordinance
METI Ordinance concerning Measurement Law (enacted on December 28, 2001 extract
Related forms (enacted on December 28, 2001 extract

METI Notification
MLAP accreditation standard ; Dioxin category(2002.2.18)
Other determination of the METI minister concerning the Cabinet Order .(2002.2.18)
MLAP accreditation standard; Chlordane etc category (2002.3.27)

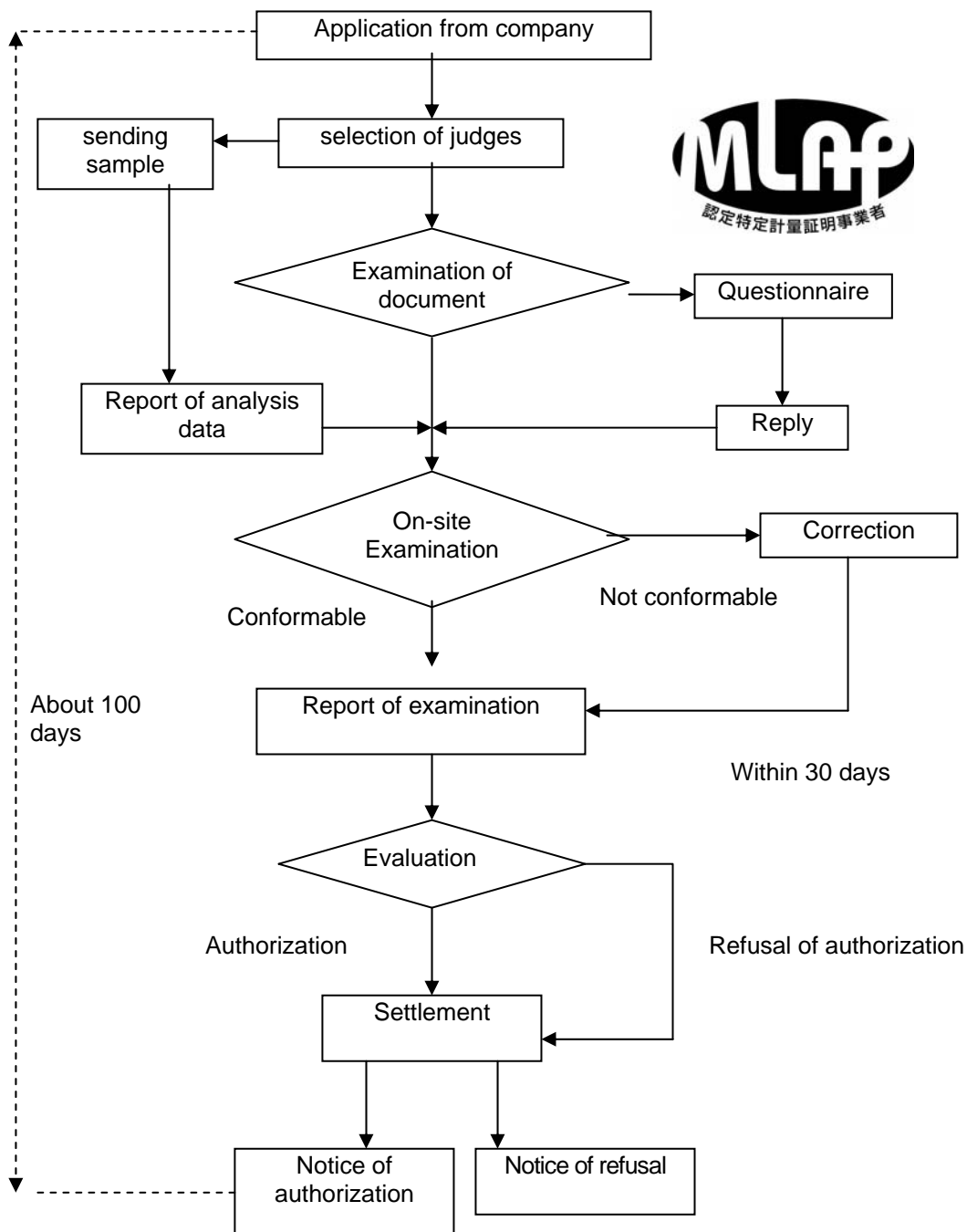
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http://www.nite.go.jp/asse/Mlap/index_e.htm

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Scheme of MLAP