



标准物质领域质量体系 and 认可有关工作

NIM's QMS of CRMs and accreditation related works



DMC of NIM

提纲/Outline

1. Introduction of NIM CRMs
2. NIM's QMS of CRM production
3. Some accreditation related works done by NIM



Introduction of NIM CRMs

National MiC System

Valid and Reliable
Measurement Results
in Routine
Laboratories

PMMs or
RMMs

Method comparison and
reference value assignment...

Measurement Standards

CRMs

Calibration, method
Validation, QC



One batch

N Laboratories not
limited by places and times

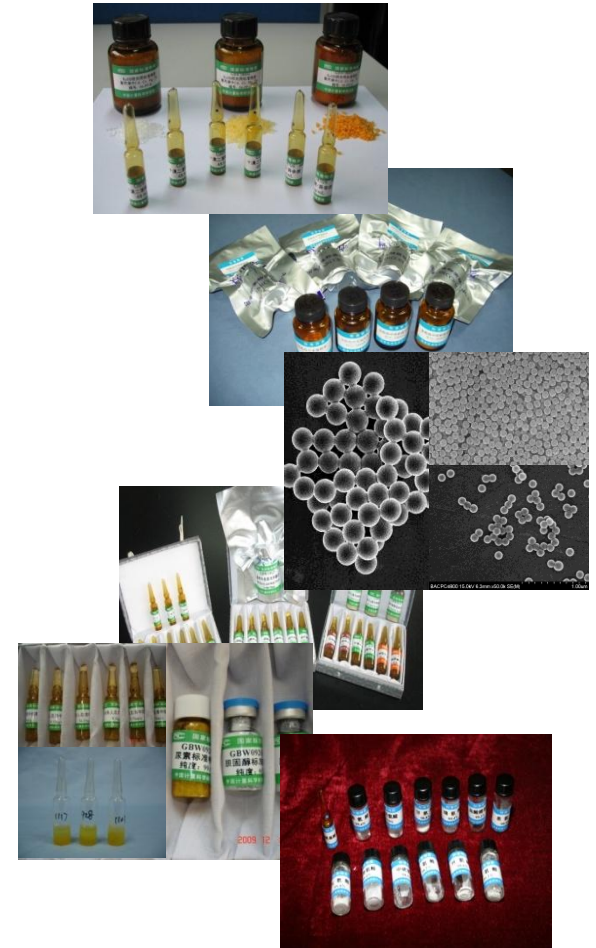
More effective way!



Introduction of NIM CRMs

NIM CRMs

- About 1500 kinds of CRM;
- All are approved as national CRM:
 - First class : 630+
 - Secondary class: 860+
- Research priorities:
 - PRMs such as Isotopes and high purity materials
 - Food safety
 - Environmental safety
 - Public health
 - Public security
 - Advanced materials
 - Energy technology
 - Industry and Consumer products



Introduction of NIM CRMs

National sharing platform for CRMs

(www.cnrm.org.cn)

 国家科技基础条件平台
National Science & Technology Infrastructure Platform

 **CNRM**
权威 专业 准确

国家标准物质资源共享平台
主办单位：国家质量监督检验检疫总局 中国计量科学研究院 订购热线：010-64524710

首页 新闻 | 管理法规 | 最新发布 | 技术规范 | 标准物质 | 化学试剂 | 网上订购 | 能力验证 | 国际比对 | 专家信息 | 会议 | 网络课堂 | 相关介绍 | 客户服务

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关于举办“食品、环境...

关于举办“食品、环境领域标准物质
研制与应用”培训交流会的通知
中国计量科学(第三轮)

1 2 3 4 5

专题服务
饮用水水质
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食品中非法添加物

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● 轻金属及合金 ● 碳素钢与碳素结构钢 ● 铸铁及生铁
● 金属中气体 ● 低合金钢 ● 纯铁
● 稀土金属矿 ● 高合金钢及不锈钢 ● 炉渣

资质证明
 

标物订购 

在线客服 

标物申请 

满意度调查 

All CRMs' information available

On-line distribution services

On-line technical consultation

On-line customer feedback

Recall system for unqualified CRMs



Introduction of NIM CRMs

National sharing platform for CRMs

(www.cnrm.org.cn)

The screenshot displays the CNRM website interface. At the top left is the logo for the National Science & Technology Infrastructure Platform (NSTI) and CNRM, with the tagline '权威 专业 准确'. The main header includes the text 'National Sharing Platform for Reference Materials' and 'Sponsor: National Institute of Metrology, China'. A navigation bar contains links for Home, News, Certified Reference Materials, Hot Fields, Technical Consultation, Order Materials, Conference, and About. Below this is a search bar with a dropdown menu set to 'Code' and a 'Search' button. To the right of the search bar is a 'Top List' section with a 'More' link. The main content area is divided into three sections: 'New Released Reference Materials' (with a 'More' link), 'Hot Fields' (with a 'More' link), and a 'Popular Fields' sidebar. The 'New Released Reference Materials' section shows four product images with labels: GBW(E)083031 Isopropylben..., GBW(E)083030 Anilin in Me..., GBW13520 Water Conten..., and GBW13519 Water Conten... The 'Hot Fields' section lists various categories such as Ferrous Metals, Technological, Organic Solutions, Non-ferrous Metals, Physics and Chemistry, Fertilizers, Geology, Nuclear and Radiation, Hormones, Energy Resources, Sanitation and Hygiene, Protein and Nucleic Acids, Food, High Purity Materials, Building Materials, Standards for Various Fields, Agriculture and Forestry, and Inorganic Solutions. The 'Popular Fields' sidebar lists categories like Heavy Metals and Their Alloys, Light Metals and Their Alloys, Gases in Metals, Rare-earth Element Ore, Ore, Rock, Coal, and Food additives and Limited Compounds.

All CRMs' information available

On-line distribution services

On-line technical consultation

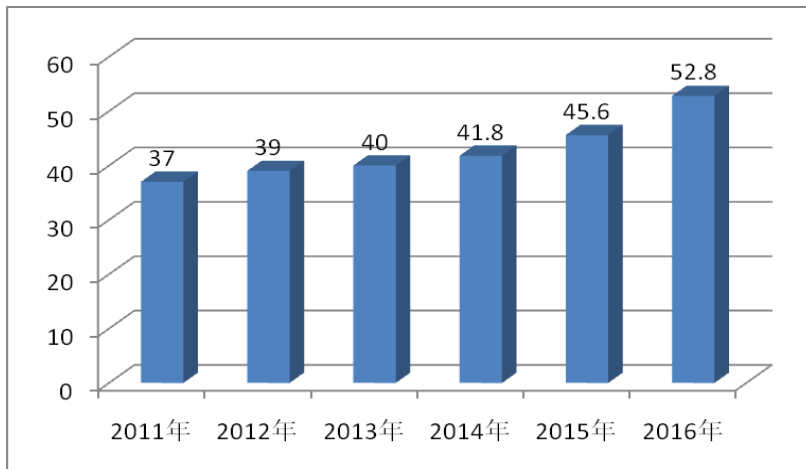
On-line customer feedback

Recall system for unqualified CRMs



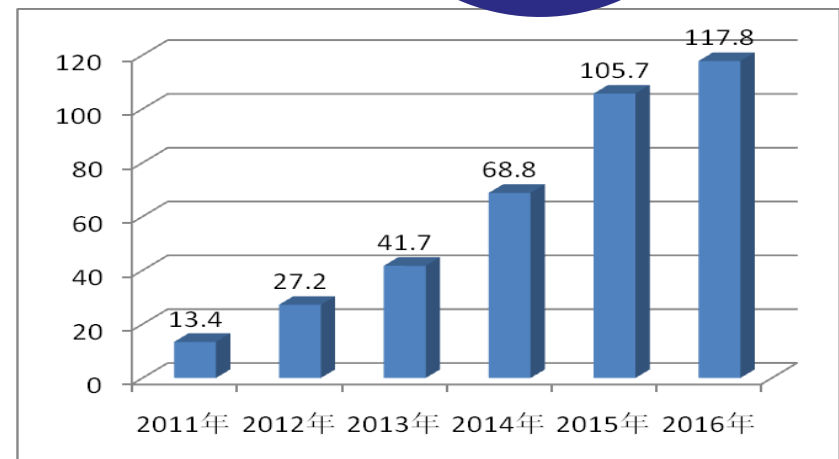
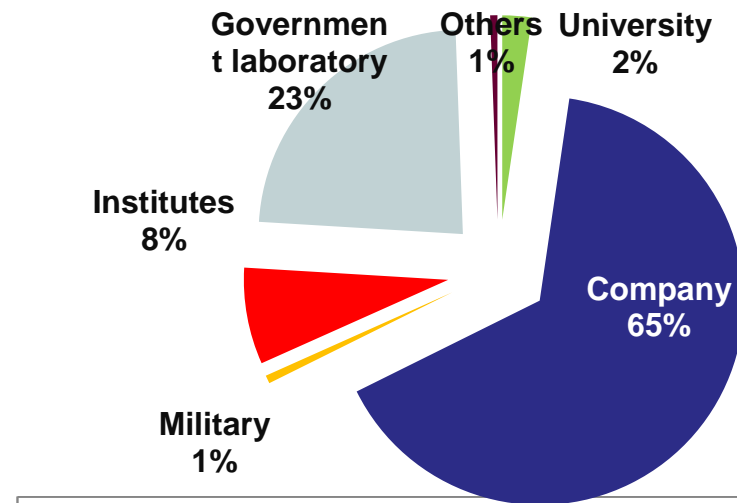
Introduction of NIM CRMs

Service statistics



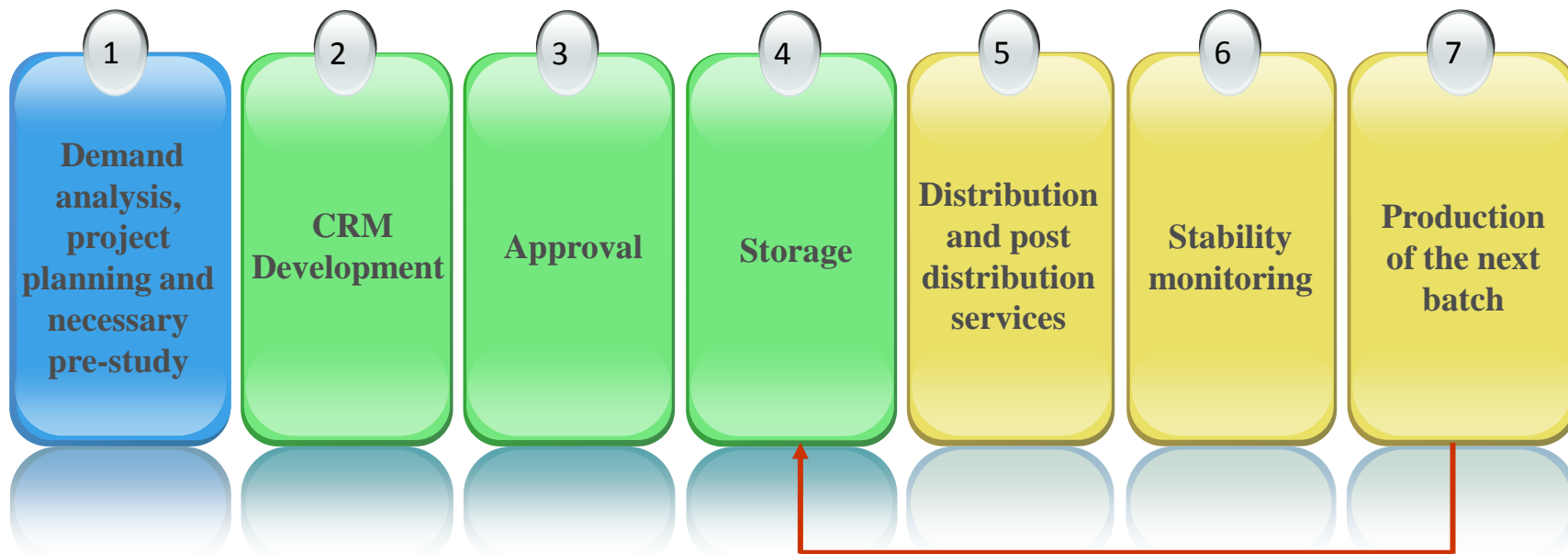
Annual distribution units

Annual visits to the website



NIM's QMS of CRM production

Flow chart of CRM production



**In conformity with ISO
G35 and G34**

NIM's QMS of CRM production

RM preparation laboratory in Hepingli campus

Jet mill



Knife mill



vacuum freeze drier



Spray drier



Ball mill



Cutting mill



dispersion machine



Mixing device

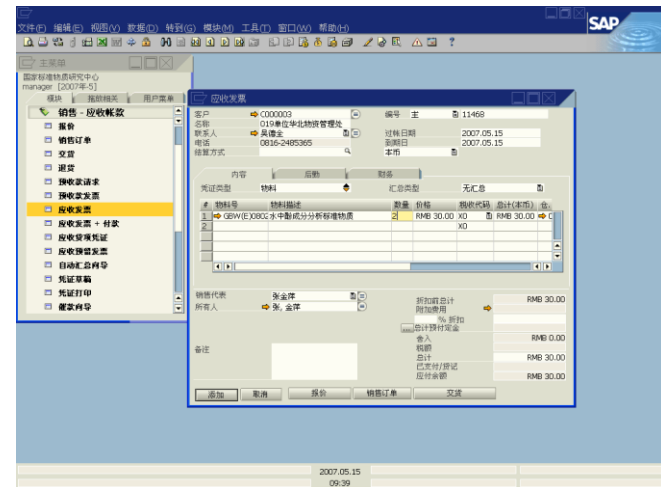


Ampoule sealing machine



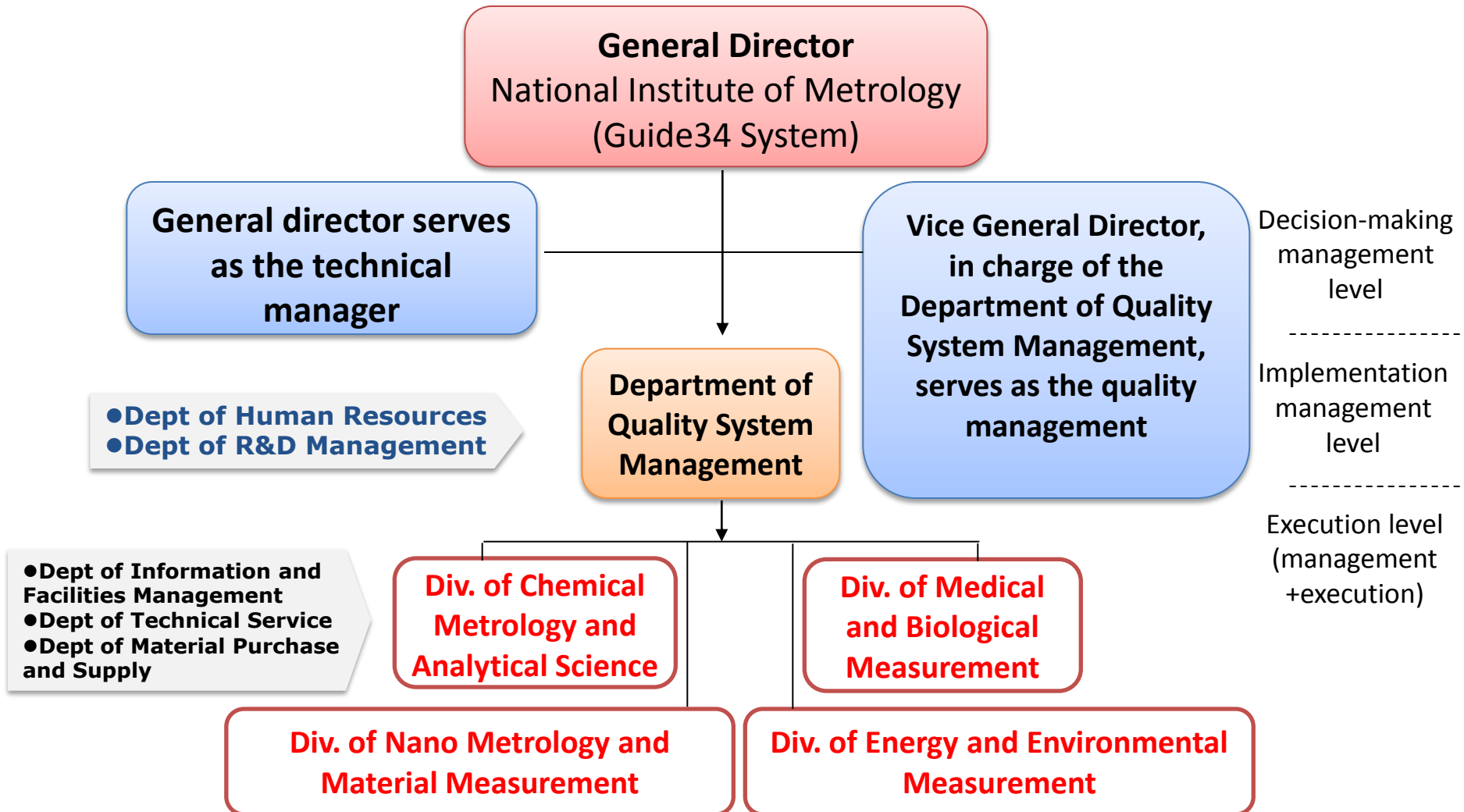
NIM's QMS of CRM production

RM storage room in Hepingli campus



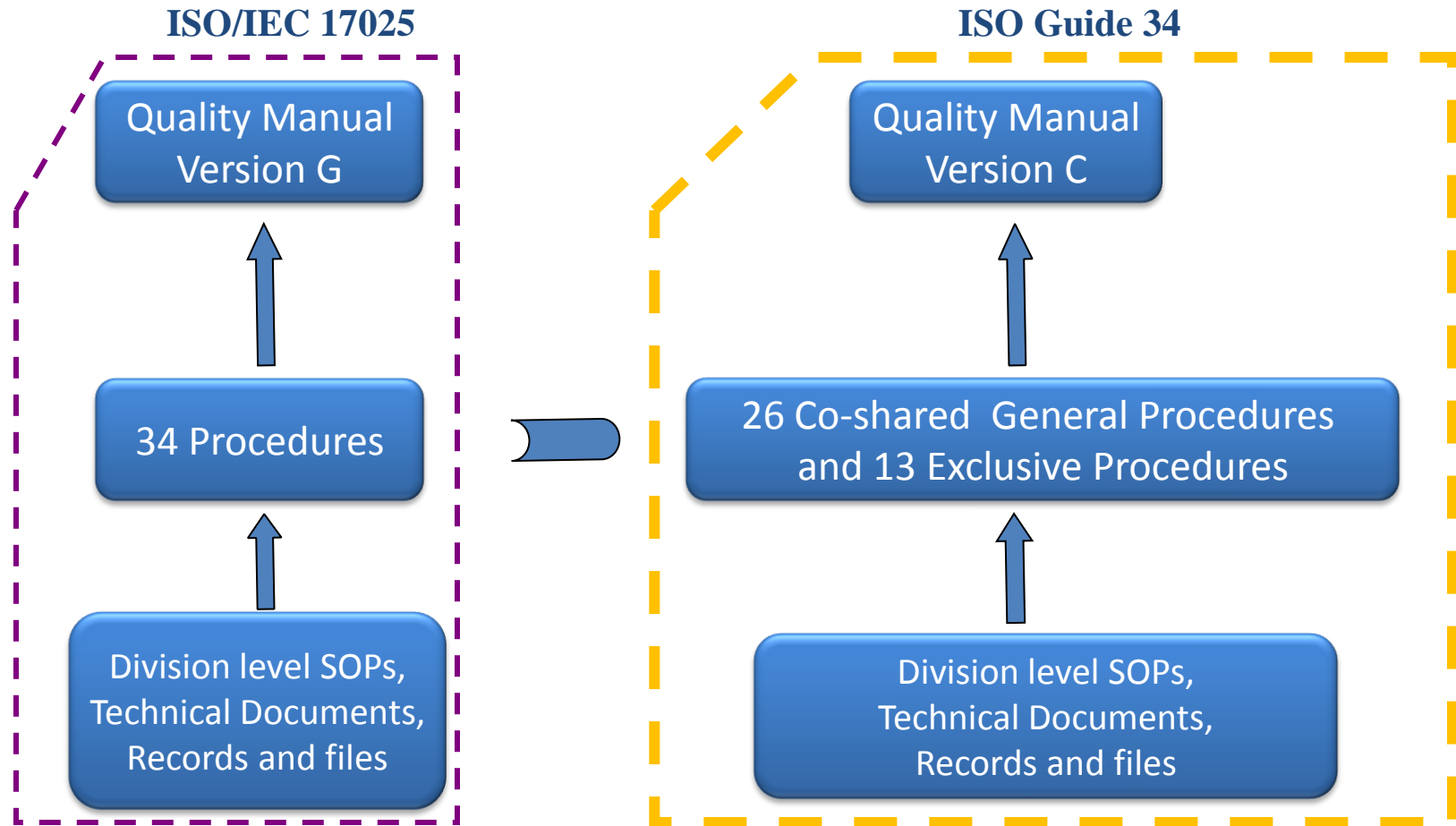
NIM's QMS of CRM production

Basic Organization Structure of the NIM G34 Management System



NIM's QMS of CRM production

Documentation system of the QMS



NIM's QMS of CRM production

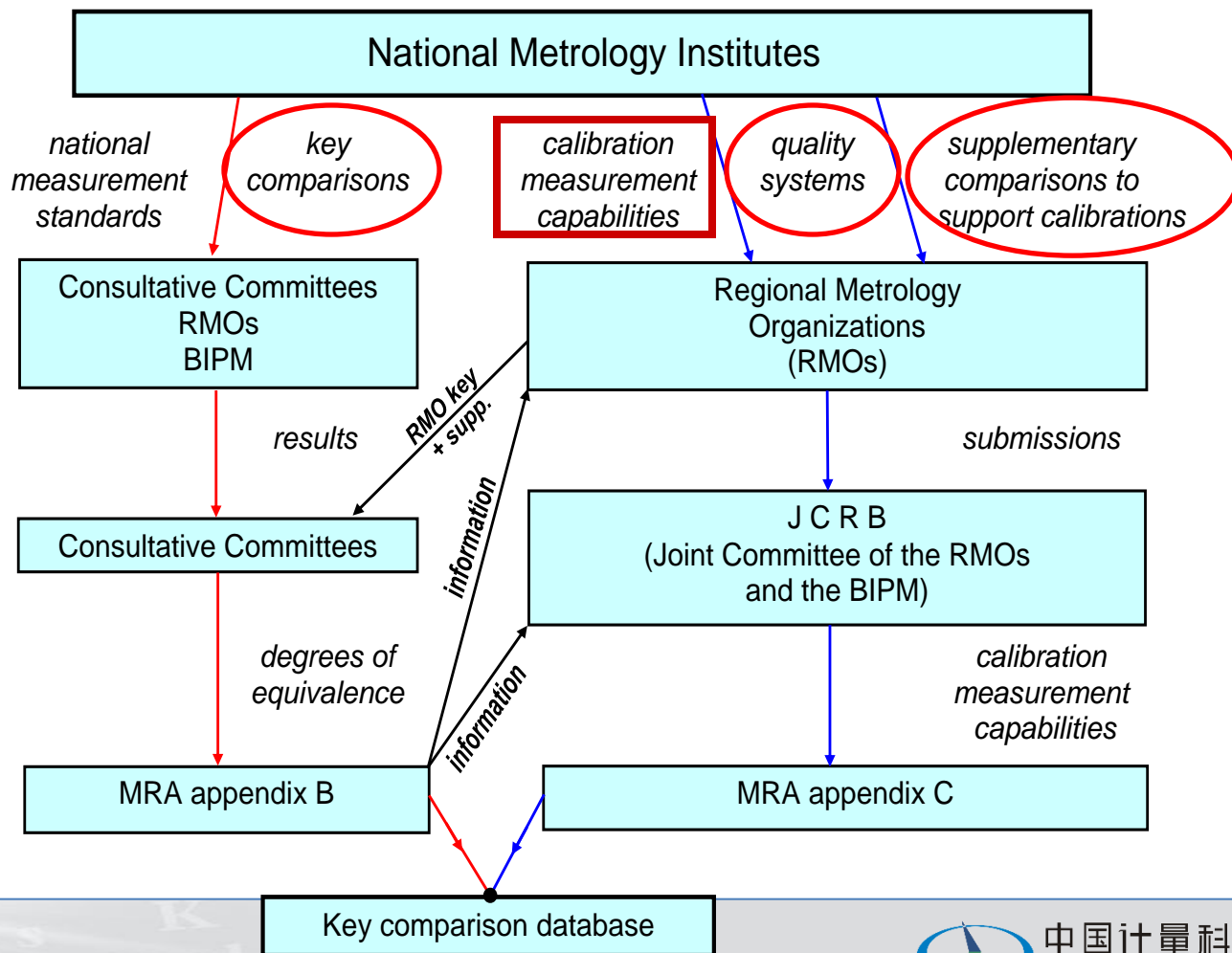
13 Exclusive Procedures Procedure Documents for Reference Material Production according to G34

NIM-CX(QM)-01	Procedure for Evaluation of the Subcontractor
NIM-CX(QM)-02	Procedure for Control of Nonconforming Work and/or Reference Material
NIM-CX(QM)-03	Procedure for Review of Development and Production Project of Reference Material
NIM-CX(QM)-04	Procedure for Control of Development and Production Process of Reference Material
NIM-CX(QM)-05	Procedure for Control of Material Handling and Storage
NIM-CX(QM)-06	Procedure for Control of Reference Material Distribution
NIM-CX(QM)-07	Procedure for Control of Reference Material Preparation
NIM-CX(QM)-08	Procedure for Evaluation of Reference Material's Homogeneity and Stability
NIM-CX(QM)-09	Procedure for Assessment of Reference Material's Uncertainty
NIM-CX(QM)-10	Procedure for Control of Reference Material Measurement
NIM-CX(QM)-11	Procedure for Determination of Reference Material's Property Value
NIM-CX(QM)-12	Procedure for Control of Reference Material Certificate and Label
NIM-CX(QM)-13	Procedure for Control of Metrological Traceability of Reference Material's Property Value

NIM's QMS of CRM production

Peer review of the NMI's QMS organized by RMO

Mutual Recognition Arrangement



NIM's QMS of CRM production

Peer review of the NMI's QMS organized by RMO

Submitted documents:

- Scope of the peer review in form of CMC table;
- Quality manual;
- QS Procedures;
- Organization structure;
- Policy on traceability establishment and typical examples;
- Policy on uncertainty evaluation and typical examples;
- List of equipments involved;
- List of technical staff involved;
- List of international comparison participated.
- Laboratory layout;
- Service deliverables to customers(CRM/PT/Other);
- General introduction on CRM certification and PT value assignment process

NIM's QMS of CRM production

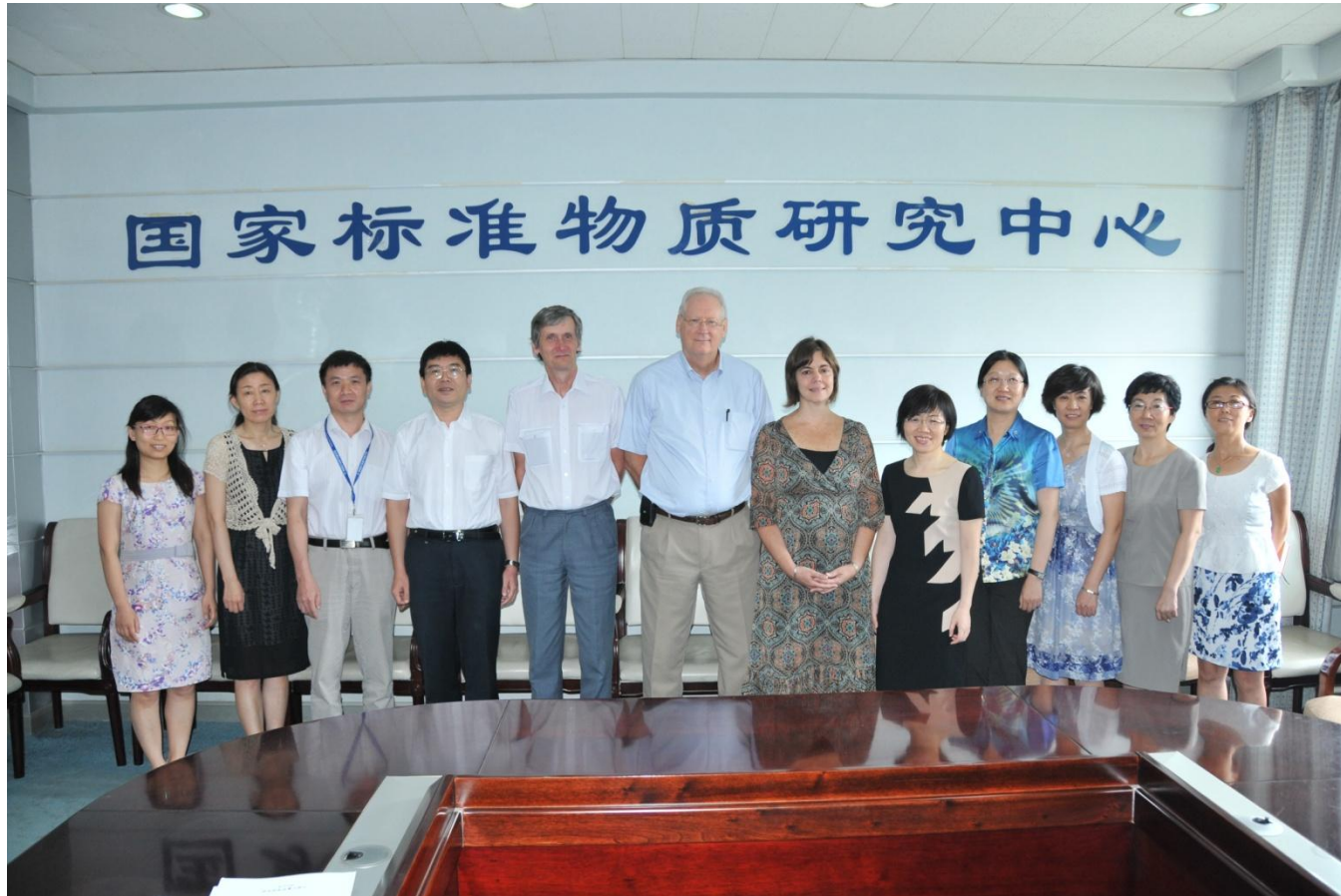
Peer review of the NMI's QMS organized by RMO

Emphasis during the on-site peer review:

- Capabilities and evidence;
- Measurement method and Method validation;
- Traceability and uncertainty evaluation;
- CRM certification and PT value assignment process (Co-certification not permitted)
- Records and reporting of results;
- Qualifications and Experience of the Technical Staff;
- Laboratory environment and Equipments;
- Subcontractor used
- Validity of the QMS (records of internal audit and management review, customer feedback, improvements)

NIM's QMS of CRM production

Peer review of the NMI's QMS organized by RMO



The third peer review (July to August, 2014)

NIM's QMS of CRM production

CMCs published in KCDB

Category	Amount of existing CMCs
High purity chemicals	226
Inorganic solutions	66
Organic solutions	101
gas	187
pH	4
water	0
Electronic conductivity	11
Advanced materials	12
Biological fluids and materials	34
Food	90
Fuels	9
Sediments, soils, ores, and particulates	0
Other materials	3
Surface, film, and engineered nanomaterials	2
viscosity	15
Total	748 (published in KCDB)

No. 1

No. 2

No. 2

No. 2

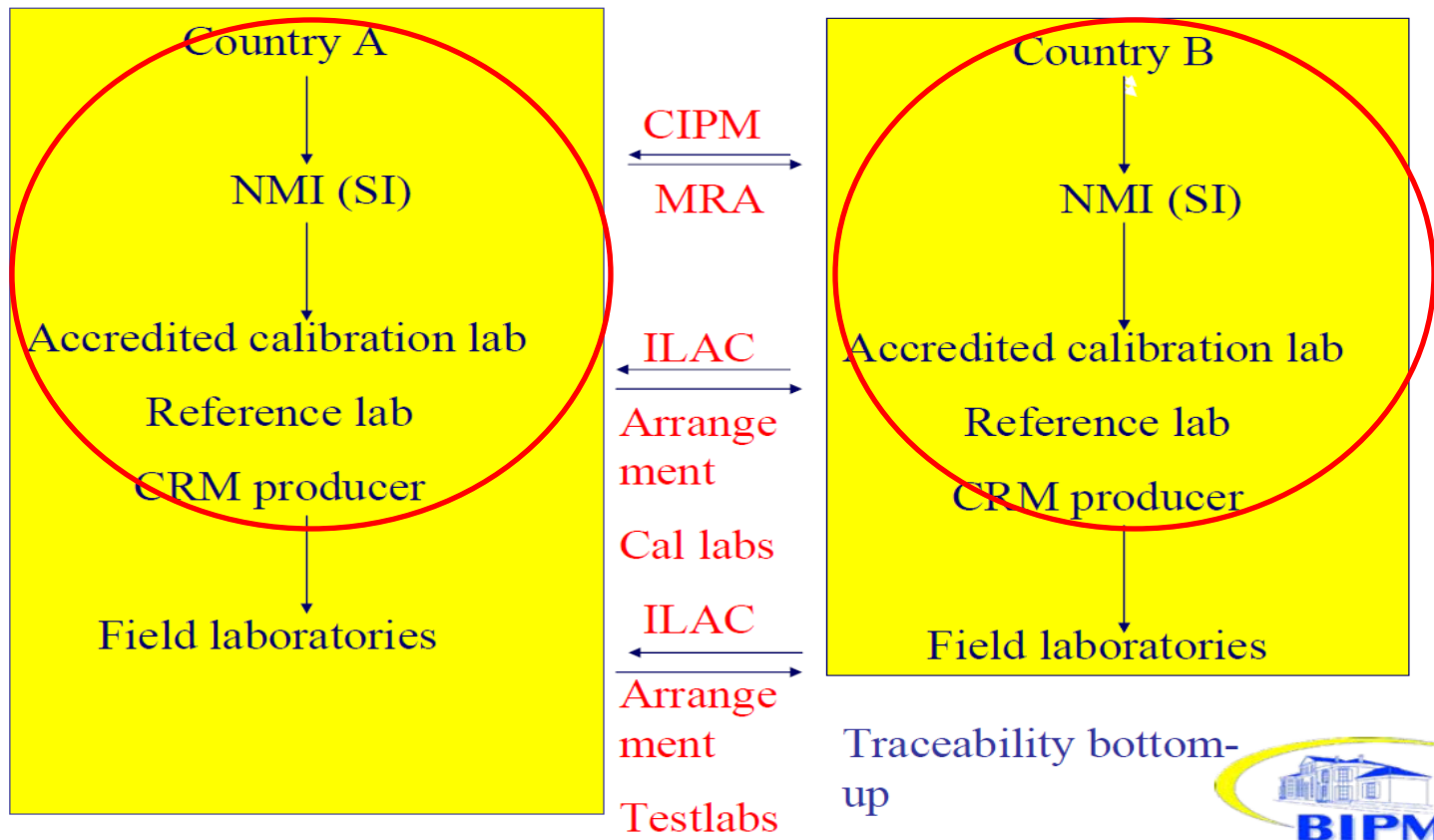
No. 2



Some accreditation related works done by NIM

NMI/DI is the nucleus for national metrology/measurement infrastructure with accreditation support.

Dissemination of traceability top-down



Some accreditation related works done by NIM

Services to be delivered by NMI/DI

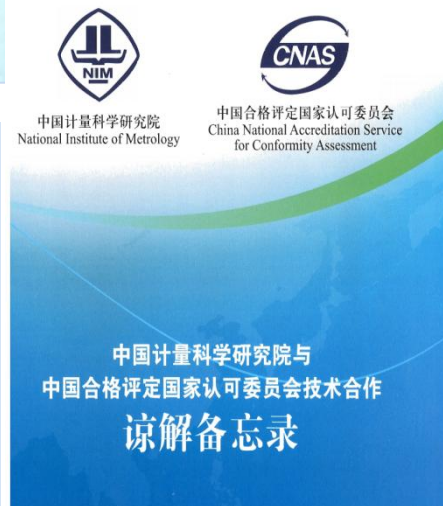
- Calibration;
- Purity analysis to provide traceability to SI(mol) ;
- Certified reference materials (production/certification of calibrants, matrix CRMs);
- Reference value assignment of PT samples;
- Values assignment to samples(e.g. in house RMs of customers);
- Validation of measurement methods/procedures.

Some accreditation related works done by NIM

MoU between CNAS and NIM for metrological traceability services

3. CNAS承认并接受NIM在计量法律、法规框架下建立和保存的国家计量基(标)准以及国家有证标准物质的地位和作用，承认

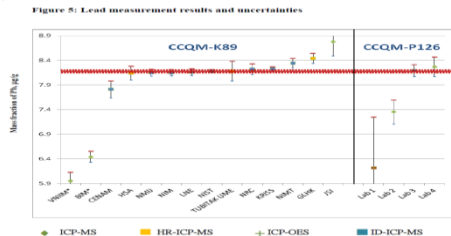
11. NIM愿意向CNAS提供量值溯源、测量不确定度、能力验证、测量审核、标准物质、校准方面的技术专家支持，参加CNAS相关技术委员会的活动，参与CNAS与实验室认可相关技术政策的制定和文件起草、人员培训、技术咨询、技术评审和评定评审活动。



Some accreditation related works done by NIM

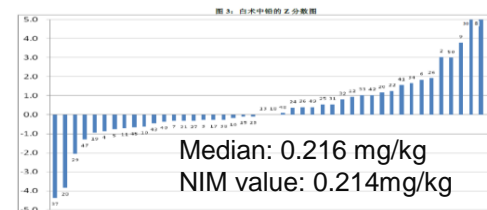
CCQM K comparison

- CCQM-K24 Cadmium in rice
- CCQM-P64,K56 Trace elements (calcium, iron, zinc and copper) in whole fat soybean powder
- CCQM-K59 Nitrite in water
- CCQM-K103 melamine in milk powder
- CCQM- K106 Pb, As and Hg in cosmetic material
- CCQM- K89 Trace and Essential Elements in Herba Ecliptae (As,Ca,Cd,Pb,Zn)
- CCQM-K106 Pb, As and Hg in cosmetic cream



Domestic PT and QC

- Cd in rice with two levels of concentration
- PT- nutritious elements in whole fat soybean powder
- Quality evaluation of reference materials :nitrite in water
- Method performance assessment of rapid testing methods for melamine in milk
- PT- Hg in cosmetic material with two levels of concentrations
- PT- Cd,Pb,Cu in white atractylodes rhizome
- PT- Pb, As and Hg in cosmetic cream



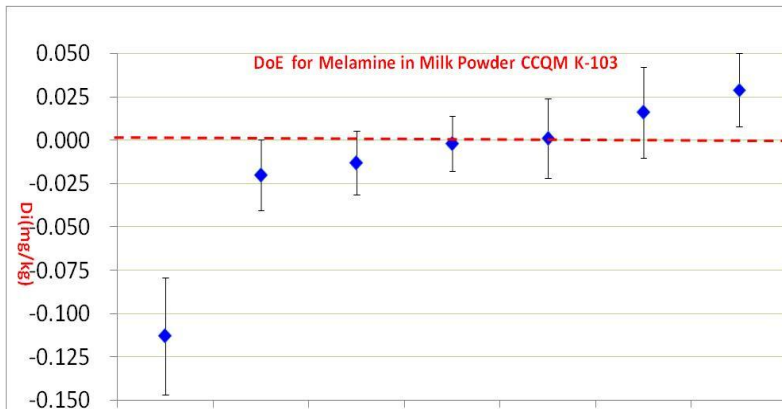
Some accreditation related works done by NIM

CCQM K comparison

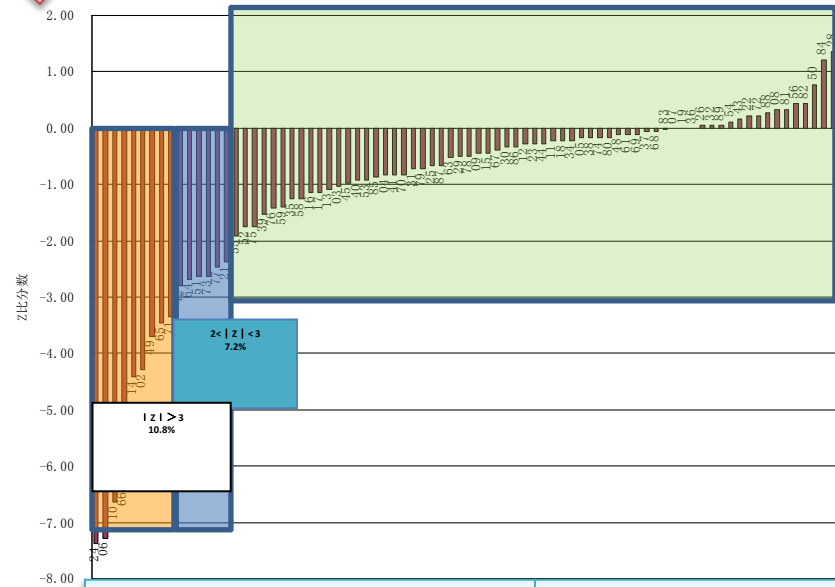
Domestic PT and QC

CCQM K103

ILC for melamine in milk powder



KCRV	Median	0.286mg/kg
KCRU	Standard uncertainty ($1.25 * MADE / \sqrt{n}$)	0.011mg/kg



Independent reference value (LC-DAD/GC-IDMS/LC-IDMS)	16.3mg/kg
U_{REF}	1.3mg/kg
Median	15.4mg/kg
Robust CV (%)	12%

中国计量科学研究院
National Institute of Metrology, China

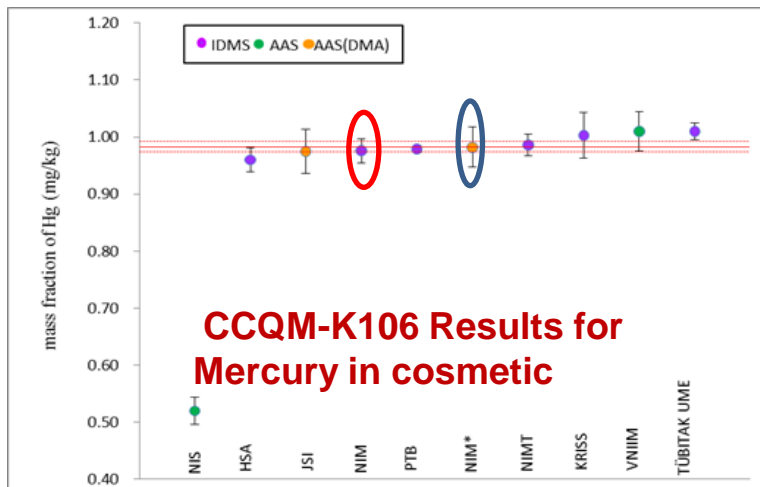


中国计量科学研究院
National Institute of Metrology, China

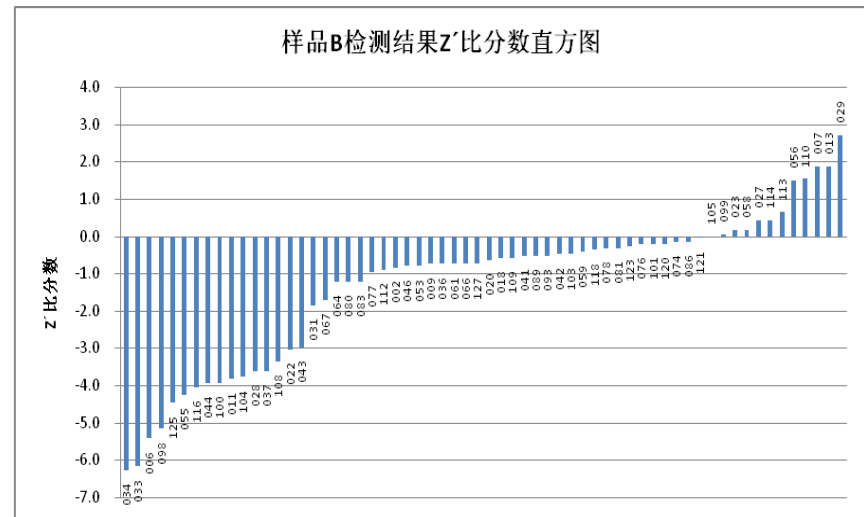
Some accreditation related works done by NIM

CCQM K comparison

Domestic PT and QC



CNCA-13-A04
Mercury in cosmetic



NIM (1): result obtained using IDMS method
NIM (2): result obtained using AAS(DMA) method

Some accreditation related works done by NIM

APMP-APLAC joint proficiency testing

Enhance the metrological capability and technical competence of field analytical laboratories in the Asia Pacific region through organization of PT programmes with **metrologically traceable reference values** provided by NMIs/DIs for performance evaluation.

APLAC-APMP Joint PT	Name	year
APLAC T093	Toxic elements (Pb and Cd) in Cabbage	2014
APLAC T094	Pesticide residues (p,p'-DDE and alpha-endosulfan) in Cabbage	2014
APLAC T095	Determination of Elements (Calcium and Cadmium) in Drinking Water	2014
APLAC T100	Toxic Elements in Wheat Flour	2015
APLAC T102	Pesticides in Fruit Juice	2015
APLAC T105	Nutritional Elements (Fe and Zn) in Wheat Flour	2016
	Elements in food supplement	2016
	Organochlorine pesticides in ginseng root	2016
	Cadmium in milk powder	2017
	BaP(Benzopyrene) in olive oil	2017

Some accreditation related works done by NIM

Training under the APMP/TCQM framework

Inorganic



Gas



Organic



Bio



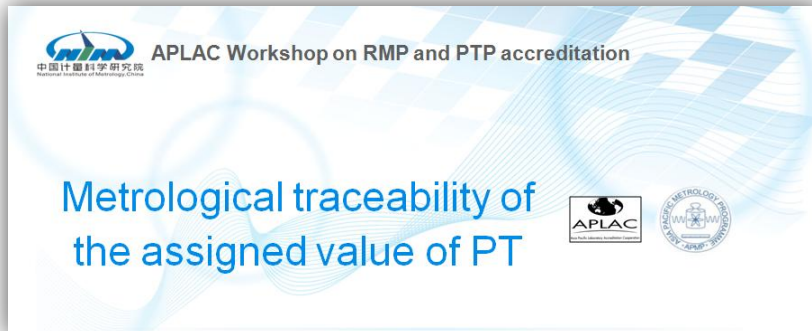
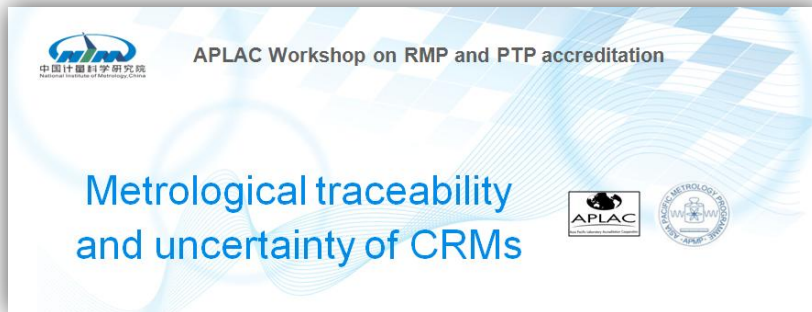
Training in Philippines for G34 and G35



Some accreditation related works done by NIM

APLAC Workshop on RMP and PTP

7-10 November 2016 Hong Kong, PR China



Many thanks for your attention!

Good traceability!
Good job!

