**Task 4.1 Calibration**

**Overview of the calibrating facility**

Contact Details

NAME/DESIGNATION (if any):

MANAGING INSTITUTE/ORGANIZATION: Bundesamt für Seeschifffahrt und Hydrographie

DEPARTMENT (if any): Oceanography

ADDRESS: Bernhard-Nocht-Straße 78, 20359 Hamburg

COUNTRY: Germany

TEL: +49 40 3190 3433

FAX: +49 40 3190 5000

Name of contact-person: Detlev Machoczek

E-mail:detlev.machoczek@bsh.de

Part a: General Information

1. Does your calibrating facility possess a well-defined organizational framework with

Dedicated staff? **Yes**

Clear hierarchy? **Yes**

Transparent chain of responsibility for management, technical/scientific

and operational decisions)? **Yes**

(If **No** to any of the above, pleaseprovide a brief description of how your facility is organized below)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

2. Briefly describe the size and nature of the annual operating budget of your facility.

Is it funded by your Institute/Centre? **Yes**

If **Yes,** is the funding constant? **Yes**

Is it funded by Projects? **No**

Is there separate funding for upgrading or acquiring new instrumentation, etc.? **No**

(Kindly provide an estimate of the annual operating budget and any additional information you think may be helpful below) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

3. Does your facility employ Quality Management Standards - ISO 9000:2000,

ISO 10012, Good Laboratory Practice (GLP), and the like - to its calibration

systems? **Yes**

(If **Yes**, please specify below)

ISO9000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

4. Does your facility possess any kind of accreditation for the calibrations? **Yes**

(If **Yes**, please specify the parameter/s or measurand/s concerned, the kind

of accreditation and the issuing body below)

\_T/S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

5. Does your facility actively endorse a policy of continual training/education of

personnel actively involved in calibration activity? **No**

(If **Yes**, please provide a brief description of the kind of activities promoted below)

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(Add lines as necessary)

6. Does your facility maintain a documented in-house Quality Assurance Programme? **Yes**

7. Does your facility maintain a formal Quality Manual (containing, at the

very least, listings and descriptions of equipment and procedures,

maintenance/calibration records and certificates for instrumentation, and

safety precautions and regulations)? **Yes**

8. Does your facility make use of control charts (Shewhart Charts, other) for

Quality Control purposes? **No**

(If **Yes,** please give details below) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

9. Can your facility assure an effective traceability chain to primary standards or,

in their absence, to conventionally accepted reference material (certified or

otherwise)? **Yes**

10. Does your facility furnish uncertainty estimations for its calibration systems? **Yes**

11. Does your facility maintain links of any kind with the National Metrology

Institute/s (NMI/s) of your country? **No**

(If **Yes**, please describe the nature of the relationship/s below) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

12. In the list of sensors below, please indicate only the ones that you currently **never** calibrate yourselves; in each case, kindly report the calibration provider (manufacturer, other) and the typical calibration interval (trimonthly, half-yearly, yearly, other) you are presently employing.

*Physical sensors for*:

Temperature, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Conductivity (Salinity), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dissolved oxygen, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X Water Currents, manufacturer

Pressure, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Optical sensors for*:

Chlorophyll a, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Turbidity, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Photosynthetically Active Radiation (PAR), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Chemical sensors for*:

Phosphates, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Silicates, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Nitrates, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Nitrites, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ammonia, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dissolved oxygen, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

pH, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total alkalinity, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total carbon dioxide, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dissolved organic carbon, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total organic carbon, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Please complete the questionnaire using the forms furnished in the following pages to provide details regarding your calibration practices for all the sensors in the above list that you do calibrate routinely*.**

**Task 4.1.1 Physical Sensors**

(\* Please provide a separate sheet for each parameter)

Part b: Calibration Parameter/measurand\*:temperature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit of measurement: °K\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range: -1,0° to + 28°\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Accuracy: 0,0001°\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Precision: 0,001°\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calibration uncertainty (if available): +/- 0,0005°\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How often do you calibrate the sensor/s or sensor system/s you are presently using for the specified parameter/measurand: please list the typical calibration interval/s you are employing; note that if you are calibrating irregularly, kindly specify why and when (e.g. before a deployment, following a malfunction, etc.).

once a year\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

2. Please provide a brief description of the calibration setup, including a list of the principal equipment, reference material (certified and/or conventionally accepted) and instrumentation involved in a typical calibration operation.

Calibration bath, reference system: Pt-100 reference resistance, triple-piont-cell: water, Gallium, precision thermometry bridge CASL, type F18

(Add lines as necessary)

3. Do you employ reference material which are mutable or unstable

(e.g. secondary standards, reagent solutions, gas mixtures,

pressure generators, etc.) to calibrate the sensor/s or sensor system/s

you are presently using for the specified parameter/measurand. **No**

(if **Yes**, please list the types of this kind of reference material you are employing; kindly specify also the measures you take to guarantee the reliability of the reference material in terms of batch-to-batch uniformity of characteristics)

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(Add lines as necessary)

4. In your view, does your facility ensure an effective traceability chain for the

specified parameter/measurand? **Yes**

5. Please provide a brief description of the procedures employed to ensure adherence of the performances of the principal equipment and reference instrumentation of the calibration setup to factory specifications (in-house monitoring of performance, in loco re-calibration, servicing by the manufacturer, etc.).

In loco recalibration

(Add lines as necessary)

6. Does your facility maintain a Manual with a description of the calibration method

and the measuring procedures, together with details of sample treatment and

preparation when these steps are present? **Yes**

(If **Yes**, kindly attach a copy to the completed questionnaire, otherwise please provide a short, description below)

Only for internal use

(Add lines as necessary)

7. In your view, is regular factory calibration/servicing necessary to obtain

optimal performances from your sensors/instrumentation for the

specified parameter/measurand in the field? **No**

(If **Yes**, please provide details of the sensors/instrumentation, indicating also the intervals you recommend for factory calibration/servicing, below)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(Add lines as necessary)

8. Do you perform field calibrations for the specified parameter/measurand? **No**

(If **Yes**, please provide a brief description of the method and procedures)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

9. Does your facility perform:

* internal quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

- independent quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

(If **Yes** to any of the above, please provide a brief description of the procedure/s applied, including a list of the principal equipment and instrumentation involved)

Quality audits, standard ISO 9000

(Add lines as necessary)

10. Does your facility actively maintain an archive containing issued calibration

reports/certificates for the specified parameter/measurand? **Yes**

(If **Yes**, please specify the document retention time/s)

yearly\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Do you have any suggestions or ideas for improving the quality of your

calibrations for any particular sensor/sensor system you are presently using

for the specified parameter/measurand (e.g. innovative reference material,

modifications to existing methodologies or new methodologies

you have developed, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions, including the details of the sensor/s or sensor system/s)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

12. Do you have any suggestions or ideas for improving the general quality

of the calibration of sensors or instruments for measuring the specified

parameter/measurand (e.g. testing and promoting the use of new

reference material, development of new methodologies, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

Submitted on: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Date)

Compiled by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Name of respondent)

Part b: Calibration Parameter/measurand\*conductivity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit of measurement: mS/cm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range: 10 – 55 mS/cm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Accuracy: 0,001 mS/cm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Precision: 0,001 mS/cm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calibration uncertainty (if available): +/- 0,003 mS/cm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How often do you calibrate the sensor/s or sensor system/s you are presently using for the specified parameter/measurand: please list the typical calibration interval/s you are employing; note that if you are calibrating irregularly, kindly specify why and when (e.g. before a deployment, following a malfunction, etc.).

once a year\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

2. Please provide a brief description of the calibration setup, including a list of the principal equipment, reference material (certified and/or conventionally accepted) and instrumentation involved in a typical calibration operation.

Guildline 8400 B

(Add lines as necessary)

3. Do you employ reference material which are mutable or unstable

(e.g. secondary standards, reagent solutions, gas mixtures,

pressure generators, etc.) to calibrate the sensor/s or sensor system/s

you are presently using for the specified parameter/measurand. **No**

(if **Yes**, please list the types of this kind of reference material you are employing; kindly specify also the measures you take to guarantee the reliability of the reference material in terms of batch-to-batch uniformity of characteristics)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

4. In your view, does your facility ensure an effective traceability chain for the

specified parameter/measurand? **Yes**

5. Please provide a brief description of the procedures employed to ensure adherence of the performances of the principal equipment and reference instrumentation of the calibration setup to factory specifications (in-house monitoring of performance, in loco re-calibration, servicing by the manufacturer, etc.).

In loco recalibration

(Add lines as necessary)

6. Does your facility maintain a Manual with a description of the calibration method

and the measuring procedures, together with details of sample treatment and

preparation when these steps are present? **Yes**

(If **Yes**, kindly attach a copy to the completed questionnaire, otherwise please provide a short, description below)

Only for internal use

(Add lines as necessary)

7. In your view, is regular factory calibration/servicing necessary to obtain

optimal performances from your sensors/instrumentation for the

specified parameter/measurand in the field? **No**

(If **Yes**, please provide details of the sensors/instrumentation, indicating also the intervals you recommend for factory calibration/servicing, below)

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

8. Do you perform field calibrations for the specified parameter/measurand? **No**

(If **Yes**, please provide a brief description of the method and procedures)

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(Add lines as necessary)

9. Does your facility perform:

* internal quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

- independent quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

(If **Yes** to any of the above, please provide a brief description of the procedure/s applied, including a list of the principal equipment and instrumentation involved)

Quality audits, standard ISO 9000

(Add lines as necessary)

10. Does your facility actively maintain an archive containing issued calibration

reports/certificates for the specified parameter/measurand? **Yes**

(If **Yes**, please specify the document retention time/s)

yearly\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Do you have any suggestions or ideas for improving the quality of your

calibrations for any particular sensor/sensor system you are presently using

for the specified parameter/measurand (e.g. innovative reference material,

modifications to existing methodologies or new methodologies

you have developed, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions, including the details of the sensor/s or sensor system/s)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

12. Do you have any suggestions or ideas for improving the general quality

of the calibration of sensors or instruments for measuring the specified

parameter/measurand (e.g. testing and promoting the use of new

reference material, development of new methodologies, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

Submitted on: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Date)

Compiled by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Name of respondent)

Part b: Calibration Parameter/measurand\*pressure\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit of measurement: dbar\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Range: 0 – 100 dbar

Accuracy: 0,0008 %\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Precision: 0,00001 bar\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calibration uncertainty (if available): +/- 0,0004 bar\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How often do you calibrate the sensor/s or sensor system/s you are presently using for the specified parameter/measurand: please list the typical calibration interval/s you are employing; note that if you are calibrating irregularly, kindly specify why and when (e.g. before a deployment, following a malfunction, etc.).

once a year\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

2. Please provide a brief description of the calibration setup, including a list of the principal equipment, reference material (certified and/or conventionally accepted) and instrumentation involved in a typical calibration operation.

WIKA, Type CPG 8000

(Add lines as necessary)

3. Do you employ reference material which are mutable or unstable

(e.g. secondary standards, reagent solutions, gas mixtures,

pressure generators, etc.) to calibrate the sensor/s or sensor system/s

you are presently using for the specified parameter/measurand. **No**

(if **Yes**, please list the types of this kind of reference material you are employing; kindly specify also the measures you take to guarantee the reliability of the reference material in terms of batch-to-batch uniformity of characteristics)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

4. In your view, does your facility ensure an effective traceability chain for the

specified parameter/measurand? **Yes**

5. Please provide a brief description of the procedures employed to ensure adherence of the performances of the principal equipment and reference instrumentation of the calibration setup to factory specifications (in-house monitoring of performance, in loco re-calibration, servicing by the manufacturer, etc.).

In loco recalibration

(Add lines as necessary)

6. Does your facility maintain a Manual with a description of the calibration method

and the measuring procedures, together with details of sample treatment and

preparation when these steps are present? **Yes**

(If **Yes**, kindly attach a copy to the completed questionnaire, otherwise please provide a short, description below)

Only for internal use

(Add lines as necessary)

7. In your view, is regular factory calibration/servicing necessary to obtain

optimal performances from your sensors/instrumentation for the

specified parameter/measurand in the field? **No**

(If **Yes**, please provide details of the sensors/instrumentation, indicating also the intervals you recommend for factory calibration/servicing, below)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

8. Do you perform field calibrations for the specified parameter/measurand? **No**

(If **Yes**, please provide a brief description of the method and procedures)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

9. Does your facility perform:

* internal quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

- independent quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

(If **Yes** to any of the above, please provide a brief description of the procedure/s applied, including a list of the principal equipment and instrumentation involved)

Quality audits, standard ISO 900

(Add lines as necessary)

10. Does your facility actively maintain an archive containing issued calibration

reports/certificates for the specified parameter/measurand? **Yes**

(If **Yes**, please specify the document retention time/s)

yearly\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Do you have any suggestions or ideas for improving the quality of your

calibrations for any particular sensor/sensor system you are presently using

for the specified parameter/measurand (e.g. innovative reference material,

modifications to existing methodologies or new methodologies

you have developed, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions, including the details of the sensor/s or sensor system/s)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

12. Do you have any suggestions or ideas for improving the general quality

of the calibration of sensors or instruments for measuring the specified

parameter/measurand (e.g. testing and promoting the use of new

reference material, development of new methodologies, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

Submitted on: \_08. 05. 2012\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Date)

Compiled by: Detlev Machoczek\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Name of respondent)

**Task 4.1.3 Chemical Sensors**

(\* Please provide a separate sheet for each parameter)

Part b: Calibration Parameter/measurand\*:\_\_\_pH-Measurement\_\_\_

Unit of measurement: pH units

Range: pH range: 7 to 9

Accuracy: + 0.01

Precision: measurement uncertainty:

Calibration uncertainty (if available): + 0.02 pH units

1. How often do you calibrate the sensor/s or sensor system/s you are presently using for the specified parameter/measurand: please list the typical calibration interval/s you are employing; note that if you are calibrating irregularly, kindly specify why and when (e.g. before a deployment, following a malfunction, etc.).

The two point calibration (pH =7; pH=9) is used at the beginning of a measurement series or after changing electrodes

2. Please provide a brief description of the calibration setup, including a list of the principal equipment, reference material (certified and/or conventionally accepted) and instrumentation involved in a typical calibration operation.

Reference material: Titrisol buffer-concentrate pH 7,00 + 0,02 (Merck 1.09887)

Titrisol buffer concentrate pH 9,00 + 0,02 (Merck 1.09889)

Reference material are tempered at 20 °C

3. Do you employ reference material which are mutable or unstable

(e.g. secondary standards, reagent & baseline solutions or blanks,

gas mixtures, etc.) to calibrate the sensor/s or sensor system/s

you are presently using for the specified parameter/measurand.

**No**

(if **Yes**, please list the types of this kind of reference material you are employing; kindly specify also the measures you take to guarantee the reliability of the reference material in terms of batch-to-batch uniformity of characteristics)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

4. In your view, does your facility ensure an effective traceability chain for the

specified parameter/measurand? **Yes**

5. Please provide a brief description of the procedures employed to ensure adherence of the performances of the principal equipment and reference instrumentation of the calibration setup to factory specifications (in-house monitoring of performance, in loco re-calibration, servicing by the manufacturer, etc.).

To assure our results we check the elecrode equipment after measurement with a Certiput buffer solution pH=7,02 (20°C) (with certificate DKD-K-14301)

6. Does your facility maintain a Manual with a description of the calibration method

and the measuring procedures, together with details of sample treatment and

preparation when these steps are present? **Yes**

(If **Yes**, kindly attach a copy to the completed questionnaire, otherwise please provide a short, description below)

Because our laboratory is accredited we have test instructions for each parameter, also for ph measurement, we investigate (sorry it is in German)

(Add lines as necessary)

7. In your view, is regular factory calibration/servicing necessary to obtain

optimal performances from your sensors/instrumentation for the

specified parameter/measurand in the field? **Yes**

(If **Yes**, please provide details of the sensors/instrumentation, indicating also the intervals you recommend for factory calibration/servicing, below)

Before installing ph electrode for continuous measurement the electrodes are calibrated.

8. Do you perform field calibrations for the specified parameter/measurand? **Yes**

(If **Yes**, please provide a brief description of the method and procedures)

We carry out continuous measurements during monitoring cruises and at our measurement station in the German Bight

9. Does your facility perform:

* internal quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

- independent quality audits to monitor and assess its

calibration system for the specified parameter? **Yes**

(If **Yes** to any of the above, please provide a brief description of the procedure/s applied, including a list of the principal equipment and instrumentation involved)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

10. Does your facility actively maintain an archive containing issued calibration

reports/certificates for the specified parameter/measurand? **Yes**

(If **Yes**, please specify the document retention time/s)

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11. Do you have any suggestions or ideas for improving the quality of your

calibrations for any particular sensor/sensor system you are presently using

for the specified parameter/measurand (e.g. innovative reference material,

modifications to existing methodologies or new methodologies

you have developed, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions, including the details of the sensor/s or sensor system/s)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

12. Do you have any suggestions or ideas for improving the general quality

of the calibration of sensors or instruments for measuring the specified

parameter/measurand (e.g. testing and promoting the use of new

reference material, development of new methodologies, etc.)? **No**

(if **Yes**, please provide a brief description of your ideas and/or suggestions) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Add lines as necessary)

Submitted on: \_04. 05. 2012\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Date)

Compiled by: Dr. Sieglinde Weigelt-Krenz\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_