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DANIDA; Environmental Information and Monitoring Programme (EIMP). Air Quality Monitoring Component

Mission 14 Report

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1 Introduction

The fourteenth mission to Egypt was undertaken in June 1999.

The EIMP project is funded by Danida and headed by COWI.

The total project includes four components:
- Coastal water monitoring (responsible VKI and COWI)
- Air pollution monitoring (responsible NILU)
- Reference laboratory (responsible VKI)
- Pollution sources and emissions (responsible COWI)

The work undertaken during this mission was concentrated on preparing standard operations procedures. The Air Quality Monitoring Team consisted of Leif Marsteen and Rolf Dreiem. Rolf Dreiem had been in Egypt for 10 months supporting the installation of monitoring stations.

The objectives of this visit included the following tasks referring to the work programme activities:

F. QA/QC
Preparation of new SOPs, change of existing SOPs.

Notes from daily activities are found in Appendix A.

2 C. Procurement of equipment, hardware and software

The flow calibration procedure of the high volume samplers requests the measurement of outdoor temperature and pressure during the calibration. The calibration is done at the site; hence the instruments must be portable. The calibration equipment that was ordered with the high volume samplers does not include temperature and pressure measuring devices nor was it specified as necessary by Kontram, the supplier. The necessity was discovered when during this mission work was started on preparing the calibration procedures. Three calibration kits were procured with the samplers, one for the two monitoring institutions at CEHM and IGSR and one for the reference laboratory at NIS.

It will be necessary to procure the following:

- 3 thermometers
- 3 barometers

The thermometers and barometers should have a calibration certificate traceable to an international standard such as NIST.

Work has started to find suitable sensors.

3 F. QA/QC

3.1 Activity F.2.1 Instrument calibration procedures

In order to calibrate high volume samplers a thermometer and barometer must be procured. The calibration procedures for the high volume sampler will be finished when the necessary instrumentation has arrived in Egypt.

The flow rate and mass calibration procedure (SOP) and accompanying forms for the TEI model 650 PM10 monitor were prepared. The procedure is based on the instrument supplier's user manual. The procedure describes how to calibrate the flow sensor and mass density calibration factor. The forms are found in Appendix B. It is an example of how the calibration results are registrated and published.

The Field calibration - flow rate and mass forms are used at the station for recording results during the field calibration. The Single Point Flow Rate Calibration and Mass Calibration forms are completed in the laboratory and stored on the computer for later reference. The two latter forms together with the Calibration certificate form are filed as the calibration document. All calibrations in the laboratory and in the field are documented according to this principle. When the reference laboratory calibrates e.g. a gas cylinder the calibration document is handed over to the monitoring institution.

3.2 Activity F.2.3 Establish Standard Operational Procedures as part of QA/QC

Most of the SOPs are now prepared. The monitoring institutions at CEHM and IGSR as well as the reference laboratory at NIS have been using the procedures since February 1998. The last updated version was handed over to the institutions in September 1998. Since September 1998 feedback from the institutions on the SOPs has been gathered. During this mission changes were made to the field calibration and maintenance SOPs and forms for monitors based on the feedback. The plan is to hand over a new updated version of the SOPs to the institutions in November 1999. This version will include most of the missing SOPs.

Appendix C includes a description of the QA/QC documentation.

Appendix D shows a list of completed QA/QC documentation.

Appendix E shows a list of missing SOPs.

4 G. Monitoring

4.1 Activity G.4.2. Service and repair

On 20 June a visit was made to the Met. Authority station by Leif Marsteen and Rolf Dreiem to inspect the data logger which reports 0 in all hourly averaged wind directions. The data logger is running software v. 5.5. No similar problems have been experienced with the previous software v.5.3, which is running at other meteorology stations. CEHM is instructed to change the software to v.5.3 to see if that fixes the bug. An e-mail was sent to the software maker EMC describing the problem and asking for a solution. A copy of the e-mail is found in Appendix F.

5 H. Reference laboratory

5.1 Activity H.3.2 Audit programme

A visit was made to the reference laboratory at NIS on 15 June where we met with Dr. Adel Basouny, Eng. Basma Kamal and Eng. Soad Sobhy to discuss experiences from the first audits. The audit reports looked good.

Some non-compliances repeated themselves, such as:

- Document version control
- Acceptance criteria
- Calibration and maintenance plan missing
- SOP for maintenance of sequential samplers.

The reason for these non-compliances is that the documents are not finished yet. This was discussed during the mission in March where the audit concept was introduced. It was agreed then to record these non-compliances even if the documents are known not to be finished yet. They will be finished in December 1999.

Several audits had been made and some questions had arisen:

- What is the audit institution to do if the monitoring institution does not solve the observed non-compliances? It is difficult for the audit institution to take any action against the monitoring institution. A memo was sent to Ulla Lund suggesting a plan of action, see Appendix G.

- NIS wanted to change the calibration certificate appearance. No decision was made.

- NIS wanted to have a copy of the last calibration document at the station to be able to check the field calibration frequency during a station audit. It was agreed upon that a new form will be made which the monitoring institution updates in a chronological order every time a calibration has been made, either at the station or in the laboratory. The form will be included in the Station manual in December 1999.

Appendix A

Notes from daily activities

Work notes spring 1999

99.06.08 Left Norway for Egypt at 09:30.

99.06.09 Arrived at Sofitel at 01:30. First day at the office. Prepared work plan. Prepared work on SOPs.

99.06.10 Started to plan change of SOPs and forms for maintenance and field calibration of monitors. They must be changed due to suggestions from the users.

99.06.11

99.06.12 Made flow and temperature conversion worksheets.

99.06.13 Went to the storage to look at PM10 monitor and High volume sampler. We have procured three calibration kits which are meant for calibrating the HiVol sampler under different filter loads and a flow calibrator for the PM10 monitor.

99.06.14 Finished plan for changes for SOPs for maintenance and field calibration of gas monitors, total of 8 SOPs and 8 forms.

Started to plan SOPs for field calibration of HiVol samplers. We do not have temperature and pressure sensors, which are necessary for calculating the flow rate. Maybe we can use the pressure calibrator meant for inline measurements in monitors.

99.06.15 Changed SOPs for maintenance and field calibration of gas monitors.

Went to NIS to discuss Non-compliance reports from their station audits. Good work. Document version control, Acceptance criteria and Calibration and maintenance plan missing at all stations - Not finished yet. The same goes for SOP for maintenance of sequential samplers.

99.06.16 Started work on SOP and forms for field calibration of PM10 monitor.

99.06.17 Continued work on SOP for field calibration of PM10 monitor. SOP and form for maintenance was changed accordingly.

99.06.18

99.06.19

99.06.20 Went to Met. Authority to inspect the data logger which reports 0 in all hourly wind directions. 1 min. averages report values above 360! Instantaneous values are all below 360. Data logger is running software v. 5.5. No problem with v.5.3 at other stations. Suggest that CaiUni changes to v.5.3 and see if the problem is solved. Send email to EMC.

99.06.21 Holiday.

99.06.22 Finished SOP and forms for field calibration of PM10 monitors.

99.06.23 Wrote mission report.

99.06.24 Went back to Norway.

Appendix B

Forms - Field calibration of a TEI model 600 PM_{10} high volume sampler

B.1. Field calibration TEI model 650 PM10 monitor

B.2. Calibration document

Field calibration - flow rate. TEI model 650 PM10 monitor

Station name	Station Id.	Serial numbes	
	AQ-	Monitor	Flow calibr.

Date		
Start time/ Stop time		

Registration of flow rates, temperature and pressure

		PM10 inlet	Calibrator connected		Ambient	
		Beta	Calibrator	Beta	Temp	Pressure
		[litre/min]	[SLPM]	[litre/min]	[°F]	[mmHg]
Reading	1					
	2					
	3					
	4					
	5					
	Average:					
		Bp	Cs	Bc	Tf	P

Flow sensor calibration

Tk [°K]		Tk = Tf [°F] * 0.56 + 255.37
Beta flow with calibrator, Bc [litre / min]		
Calibrator flow, C [litre / min]		C = (760 / P) * (Tk / 273.15) * Cs
Difference in flow, D [litre / min]		D = Bc - C
Deviation in flow, Dp [%]		Dp = 100 * D / C
Within acceptance criteria?		| Dp | ≤ 7 %
Calibration constant, Cf		Cf = C / Bc
Old calibration constant Co		Compute only if | Dp | ≤ 7 %
New calibration constant Cn		Cn = Co * Cf

PM10 inlet flow calibration

PM10 inlet flow, Bp [litre / min]		
PM10 design flow, Df [litre / min]	18.9	
Difference in flow, D [litre / min]		D = Bp - Df
Deviation in flow, Dp [%]		Dp = 100 * D / Df
Within acceptance criteria?		| Dp | ≤ 10 %

Calibration	Constant		Comments
	PM10 intake in place		
NB!	Run menu displayed		
	Instantaneous dispaly		
	Logger monitor off		Signature

Field calibration - mass. TEI model 650 PM10 monitor

Station name	Station Id. AQ-	Serial numbes Monitor	Flow calibr.
Date			
Start time/ Stop time			

Mass calibration

Beta mass density, Db		
Calculated mass density, Dc		
Difference in mass density, D		D = Db - Dc
Deviation in mass density, Dp [%]		Dp = 100 * D / Dc
Within acceptance criteria?		| Dp | ≤ 0.25 %
Old calibration constant MU		
New calibration constant MU		

NB!	PM10 intake in place	
	Run menu displayed	
	Instantaneous dispaly	
	Logger monitor off	
Comments		
Signature		

Calibration Certificate

Calibration method: Standard Operational Procedures Manual
Field calibration of a TEI model 650 PM10 monitor

Guest
Name: CEHM
Address: Cairo University
Operator:

Calibrating item
Model: TEI 650
PM10 monitor
Status at receival:
Date received:
Date calibrated:
Date returned:
Status when returned:

Calibrating institution
Name: CEHM
Address: Cairo University
Operator:

Location of calibration
Name: Tabbin
Address:

This calibration certificate includes 3 pages, the front page and the calibration sheet(s). Identification of calibration standards and calibrating items are found on the calibration sheet. The certificate shall not be reproduced, except in full, without written approval from the laboratory.

This calibration certificate has been authorized by:

Date	Position	Name	Signature

Single Point Flow Rate Calibration - PM10 Monitor

Guest			**Reference**			
Owner: CEHM	Date:		Cal. lab: CEHM			
Monitor: TEI 650	Ser. no:		Calibrator: awaaxxx1	Ser. no:		
Design flow: 18.9 litre/min			Purpose:		Std. Tmp:	273.15 °K
			At station:		Std. Pres:	760 mmHg

	PM10 inlet connected	**Calibrator connected**		**Ambient**	
	Beta [litre/min]	Calibrator [SLPM]	Beta [litre/min]	Temp. [°F]	Pressure [mmHg]
	18.7	17.6	18.3	32.0	754.0
	18.8	17.7	18.2	32.1	755.0
	18.8	17.8	18.3	32.0	776.0
	18.7	17.7	18.4	32.2	754.0
	18.8	17.7	18.2	32.0	755.0
Average:	18.76	17.70	18.28	32.06	758.80
St. Dev:	0.055	0.071	0.084	0.089	9.628

Results - PM10 Inlet

	Average [litre/min]	St. Dev. [litre/hour]
PM10:	18.76	0.055
Design:	18.90	
Deviation:	-0.14	-0.74 %

Deviation <= 10%, OK

Results - Flow sensor

	Average [litre/min]	St. Dev. [litre/hour]
Beta:	18.28	0.084
Calibrator:	17.73	0.071
Deviation:	0.55	3.10 %
Corr. fact:	0.9700	

Deviation <= 7%, OK

Calibrator corr. to ambient cond.

Laboratory environment

Temp: _____ °C
Press: _____ mm Hg
Rel. h: _____ %

Init: _____

Mass Calibration - PM10 Monitor

Guest				**Reference**		
Owner:		Date:		Cal. lab:		
Monitor:		Ser. no:		Calibrator:	Foil	Ser. no:
				Density:	3200	

Results - Mass density

	Density	
Calibrator:	3200.00	
Calculated:	3195.00	
Deviation:	-5.00	-0.16 %

Deviation <= 0.25%, OK

Laboratory environment

Temp:		°C
Press:		mm Hg
Rel. h:		%

Init: _____

Appendix C

Description of the QA/QC documentation

1. The Standard Operations Procedures manual

The Standard Operations Procedures manual includes copies of all SOPs and accompanying forms used to document the SOPs as well as copies of forms used in history logbooks and station manuals.

It is to be considered as a collection of originals, which are copied when needed.

The accompanying form is stored after each SOP. The forms used in history logbooks and station manuals are stored at the beginning of the manual.

2. The History log-book manual

The History logbook includes the log of every instrument at the station as well as a log of the station/ shelter itself. It is kept at the laboratory. Here all major maintenance, calibrations and movements of the instrument and shelter is recorded. It is used as reference when the quality of the collected data is questioned. Such requests can often occur long time after the data was collected. It is therefore important to keep good records at all times.

The History logbook includes one section for each instrument at the station and one section for the shelter itself. The instruments are identified by model and serial number. Since the history log of an instrument is stored in the logbook of a particular station the history log of that instrument will occur in more then one History logbook when the instrument is moved between stations. Table 1 shows the content of the history logbook.

Table 1. The History logbook.

Contents of History log	Doc. ID	Includes
Station history log-book	SHL-	The history of the shelter itself
Equipment history log-book	EHL-	The history of the instrument, gas cylinder, etc. One section for each instrument at the station

The Station history log-book section

For every station/ laboratory there is a History logbook for the shelter/ room itself. Section 1 of the History logbook includes the Station history logbook.

The logbook should be consulted before every visit to the station to check for special conditions or arrangements.

The technician who is responsible for the station maintains the logbook. It should be updated immediately after a site visit based on notes from the Travel

report. It is updated when repairs or refurbishing of the housing are done or when surrounding conditions change, e.g. new intake holes are made, air condition changed, air condition turned on/ off, high temperature inside station, e.t.c. The logbook also includes the Station Visit log.

Table 2 shows the contents of the Station history logbook.

Table 2. Contents of the Station history logbook section.

Contents	Doc. ID	Includes
Front page	SHL-1	Table of contents
Station data sheet	SHL-2	Product maker, local sales representative, model, serial number e.t.c. This applies only to stand-alone shelters. It is completed only once at the delivery.
Product maker's data sheet	-	The product maker's data sheet for that particular shelter. This applies only to stand-alone shelters.
Technical information sheet	SHL-3	Station location, owner of premises, local contact person, e.t.c. Accessibility, electrical power, benches, racks, e.t.c.
Inventory list	-	Complete list of all instruments at the site and their serial numbers.
List of documentation	SHL-4	A list of all SOPs and accompanying forms which are used at the station.
Station history log	SHL-5	Remarks on maintenance and repairs done to the station itself. It is a chronological list of the station status
Station visit log	SM-2	Chronological notes on station visits, archive
Travel reports	SM-3	Notes made at the station for entering into the history logbooks etc.

The Equipment history log-book section

For every instrument there is an Equipment history logbook section in the History logbook for the station at which the instrument is running. The Equipment history logbook sections are stored after the Station logbook section.

The logbook is maintained by the technician who operates the specific instrument. It should be updated immediately after calibrations or site visits based on notes from the Travel report and forms.

Table 3 shows the contents of the Equipment history logbook.

Table 3. Contents of the Equipment history logbook section.

Contents	Doc. ID	Includes
Front page	EHL-1	Table of contents
Equipment data sheet	EHL-2	Product maker, local sales representative, instrument model, serial number e.t.c. It is completed only once at the delivery.
Product maker's data sheet	-	The product maker's data sheet for that particular instrument.
Equipment history log	EHL-3	Remarks on maintenance, repairs, adjustments, calibrations e.t.c. It is a chronological list of the instrument status.
Maintenance and calibration sheets	-	Maintenance and calibration sheets completed at the station.
Calibration certificates	-	Calibration certificates

3. The Station manual

For every station and laboratory there is a station manual. The Station manual is stored at the site.

The Station manual is maintained by the technician who is responsible for the station. The station manual includes the Visit log where all visitors to the station must write down the purpose of their visit and sign. The Station manual also includes all SOPs and forms used at the station.

The last three months of the Visit log should always remain at the station. The previous months should be brought to the laboratory every three months and stored in the Station history logbook.

Table 4 shows the contents of the Station manual.

Table 4. Contents of the Station manual.

Contents	Doc. ID	Includes
Front page	SM-1	Table of contents
Station data sheet	SHL-2	Copy from Station history log-book section
Product maker's data sheet	-	Copy from Station history log-book section
Technical information sheet	SHL-3	Copy from Station history log-book section
Inventory list	-	Copy from Station history log-book section
Station visit log	SM-2	Chronological notes on station visits
Standard Operation	-	All SOPs and accompanying forms

Procedures and forms		used at the station.
Travel report	SM-3	Blank forms for notes to be entered into the history log-books

4. The Daily data validation manual

Every station and laboratory has a Daily data validation logbook section in the Daily data validation manual. The manual is stored at the Computer centre.

The logbooks are maintained by the technician who is responsible for validating all incoming data. Each logbook includes daily notes concerning the quality of the data and possibly malfunctioning instruments or telephone lines. If susceptible data is encountered the technician responsible for that particular station must be notified immediately.

Table 5. Contents of the Daily data validation manual.

Contents	Doc. ID	Includes
Daily data validation log	CC-1	Remarks on possibly invalid data, communications problems, etc.

Appendix D

List of completed QA/QC documentation

Table 6. List of QA/QC documents.

Document
Travel report
Travel report
Station Manual
Front page
Station visit log
Station Log book
Front page
Station data sheet
Technical information sheet
Station history log
List of Documentation
List of documentation
Equipment Log book
Front page
Equipment data sheet
Equipment history log
Daily data validation Log book
Daily data validation log
SOP Manual
Front page, Contents and Introduction
Calibrating a SO2 reference standard gas cylinder
Calibrating a NO reference standard gas cylinder
Calibrating a CO reference standard gas cylinder
Calibrating a HC reference standard gas cylinder
Calibrating a SO2 travelling or working standard gas cylinder
Calibrating a NO travelling or working standard gas cylinder
Calibrating a CO travelling or working standard gas cylinder
Calibrating a HC travelling or working standard gas cylinder
Calibrating a TEI model 145 PT Z/S check unit
Dynamic calibration of a TEI model 43C SO_2 monitor
Dynamic calibration of a TEI model 42C NO_x monitor
Dynamic calibration of a TEI model 47C CO monitor
Dynamic calibration of a TEI model 55C HC monitor
Dynamic calibration of a TEI model 49C O_3 monitor
Two point calibration of a TEI model 43C SO_2 monitor
Two point calibration of a TEI model 42C NO_x monitor
Two point calibration of a TEI model 47C CO monitor
Two point calibration of a TEI model 55C HC monitor
Two point calibration of a TEI model 49C O_3 monitor
Flow calibration of a NILU model FK NO_2 sequential

Document
Flow calibration of a NILU model FK SO_2 sequential
Field calibration of a TEI model 43C SO_2 monitor
Field calibration of a TEI model 42C NO_x monitor
Field calibration of a TEI model 47C CO monitor
Field calibration of a TEI model 55C HC monitor
Field calibration of a TEI model 650PM10 PM_{10}
Routine maintenance on a TEI model 43C SO_2 monitor
Routine maintenance on a TEI model 42C NO_x monitor
Routine maintenance on a TEI model 47C CO monitor
Routine maintenance on a TEI model 55C HC monitor
Routine maintenance on a TEI model 49C O_3 monitor
Routine maintenance on a TEI model 650 PM_{10} monitor
Routine maintenance on a TEI model 145 PT Z/S check unit
Routine maintenance on a TEI model 610 TSP high volume sampler
Installing a reference standard gas cylinder
Installing a travelling or working standard gas
Installing an EMC Station Manager data logger hardware
Installing an EMC Station Manager data logger software
Preparing the documentation for a new station
Air quality station audit (Not finished)

Table 7. Forms accompanying the SOPs.

Form
Reference Gas Calibration
Calibration Certificate
Reference gas calibration - NO
Reference gas calibration - SO2
Reference gas calibration - CO
Reference gas calibration - HC
Working Gas Calibration
Calibration Certificate
Log Working gas calibration - NO
Certificate Working gas calibration - NO
Log Working gas calibration - SO2
Certificate Working gas calibration - SO2
Log Working gas calibration - CO
Certificate Working gas calibration - CO
Log Working gas calibration - HC
Certificate Working gas calibration - HC
Gas Calibration Log sheet
Span gas cylinder log
Zero/ span unit log
Dynamic Calibration of Monitors
Calibration Certificate
Dynamic Calibration. SO2 monitor
Dynamic Calibration. NOx monitor
Dynamic Calibration. CO monitor
Dynamic Calibration. HC monitor
Dynamic Calibration. O3 monitor
Calculation of calibration parameters
Linearity check - Calibrator
Two Point Calibration of Monitors
Calibration Certificate
Two Point Calibration. SO2 monitor
Two Point Calibration. NOx monitor
Two Point Calibration. CO monitor
Two Point Calibration. HC monitor
Two Point Calibration. O3 monitor
Calculation of calibration parameters
Calibration of PM10 monitors
Calibration Certificate
Single point flow rate calibration - PM10 monitor
Mass density calibration - PM10 monitor

Form
Calibration of Flow Rate Meters
Calibration Certificate
Gas meter flow calibration
Rotameter flow calibration
Field Calibration of Monitors
Field calibration. TEI model 43C SO2 monitor
Field calibration. TEI model 42C NOx monitor
Field calibration. TEI model 47C CO monitor
Field calibration. TEI model 55C HC monitor
Field Calibration of PM10 Monitors
Field calibration - flow rate. TEI model 650 PM10 monitor
Field calibration - mass density. TEI model 650 PM10 monitor
Monitor Maintenance
Routine maintenance. TEI model 42C NOx monitor
Routine maintenance. TEI model 43C SO2 monitor
Routine maintenance. TEI model 47C CO monitor
Routine maintenance. TEI model 55C HC monitor
Routine maintenance. TEI model 49C O3 monitor
Routine maintenance. TEI model 650 PM10 monitor
Sampler Maintenance
Routine maintenance. TEI model 610 TSP monitor
Station audit
Station audit (Not finished)

Appendix E

List of not finished SOPs and forms

At the present SOPs and forms for the FK, SF1 and passive sampler exists but they need to be changed. The field calibration and maintenance SOPs for the Air Metrics PM_{10} sampler will be prepared by CEHM. The sampler has not been put into operation yet.

Table 8. List of not finished SOPs. Each SOP will probably need a form.

Document
Field comparison of a TEI model 49C O_3 monitor
Field calibration of a TEI model 610 TSP high volume sampler
Field calibration of a TEI model 600 PM_{10} high volume sampler
Field calibration of an Air Metrics model MiniVol PM_{10} sampler
Routine maintenance on a TEI model 146 multipoint calibrator
Routine maintenance on a TEI model 49CPS O_3 calibrator
Routine maintenance on a TEI model 600 PM_{10} high volume sampler
Routine maintenance on a NILU model FK SO2 sampler
Routine maintenance on a NILU model FK NO2 sampler
Routine maintenance on a NILU model SF1 Dust fall sampler
Routine maintenance on an IVL model Passive sampler
Routine maintenance on an Air Metrics model MiniVol PM_{10} sampler

Appendix F

E-mail to EMC, Missing wind direction data

From: eimp@intouch.com Sent: Su 99.06.20 16:14
To: emc@emcslo.com
Subject: Erratic Wind direction readings in data logger

Dear Sirs,

Introduction
The EIMP project in Egypt uses the EMC Model SM-2000 Station Manager Data Logger to collect data at some 20 measurement sites. In the latest shipment of data loggers the data logger software was updated from v.5.3 to 5.5. Using v. 5.5 to collect wind direction data from a MetOne translator are causing problems. The Wind Direction is not recorded correctly. This is the situation at all our meteorological stations using v.5.5 (2 stations). At our earlier installations (2 stations) we are still using v.5.3 and have not experienced similar problems.

Documentation of logging of wind direction

These are the formats used:
Prm, Avg, InpCh, DataFmt, Units,FScale, Zero, MaxV, MinV, FSV, 1Min, 1Hr, RofCh
WDA, Scalar HWD, 12, DDD.D, DEG, 360, 0, 361, -1, 1 v, 40, 40, 400

- We have tried using a copy of the setup from a station that is working properly without luck.

- We have configured a new setup using one of the default setups delivered with v.5.5 without luck

- The instantaneous voltage readings vary between 0 and 1.009 Volts.

- The instantaneous wind direction reading varies from 0 to 360 degrees.

- The one minute averages vary from 0 to well over 400 (four hundred) degrees, even though none of the instantaneous readings are above 360 degrees.

- The one hour averages equal 0 all the time, probably because the one minute averages above 360 degrees are rejected.

Here are some instantaneous voltage and wind direction readings. The readings are not correct to the last decimal due to problems with recording one second updates.

Some good readings:
0.997 V - 358 Deg
0.015 V - 5.3 Deg
0.505 V - 181.9 Deg
0.605 V - 217 Deg

Some strange readings:
0.67 V - 1 Deg
0.34 V - 7 Deg
0.68 V - 5 Deg
1.009 V - 2.1 Deg
1.004 V - 1.3 Deg
0.6 V - 7 Deg
0.3 V - 1.7 Deg
0.3 V - 1.8 Deg
0.34 V - 3 Deg

There are at least two problems:
1) It seems like voltage readings around 0.6 and 0.3 V are converted to strange degrees values some times.
2) The one minute averages varies from 0 to well over 400 (four hundred) degrees, even though none of the instantaneous readings are above 360 degrees.

What we will do immediately is to replace v.5.5 of the software with v.5.3, which is working ok. Could you please look into the problems.

Best regards,

Leif Marsteen and Rolf Dreiem
Air Pollution Specialists

EIMP Project
EEAA Building
30 Misr Str.
Maadi, Cairo, Egypt
Tel. (202) 525 6442
Fax. (202) 525 6467
e-mail eimp@intouch.com

After July 4 send e-mail answer to: leif.marsteen@nilu.no and rolf.dreiem@nilu.no
or fax to: +47 63 89 80 50

Appendix G

Plan of action when non-compliances are not corrected

EIMP

Note

Subject	Plan of action when non-compliences are not corrected
Date	23 Jun 1999
To	Ulla Lund
Copy	
From	Leif Marsteen

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6442
Fax: +(202) 525 6467

E-mail: eimp@intouch.com

The following plan of action is suggested when the monitoring institution fails to implement a corrective action within the specified date limit as set in a non-complience report.

1. If the monitoring institution fails to report back a successful corrective action to the reference lab within the date limit specified in the non-complience report the reference lab will send a letter to the monitoring instituion asking what is the status. A new date limit is set to 14 days after the original date limit.

2. If the monitoring institution fails to report back a successful corrective action to the reference lab within the new date limit the reference laboratory will send a letter to the monitorng institution informing them that EEAA will be noticed about the missing corrective action.

3. The reference laboratory sends a quarterly report to EEAA including all overdue corrective actions at the time of reporting.

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P.O. Box 100, N-2027 Kjeller – Norway

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REPORT PREPARED FOR:
COWI/EIMP
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ABSTRACT
The fourteenth mission to Egypt on the Danida EIMP programme included preparation of QA/QC documentation.

NORWEGIAN TITLE
Overvåkingsprogram for luftkvalitet i Egypt

KEYWORDS		
EIMP	QA/QC	Egypt

ABSTRACT (in Norwegian)

* *Classification*
A Unclassified (can be ordered from NILU)
B Restricted distribution
C Classified (not to be distributed)