



Annex 5

Local Verification Results - Rome



Table of Contents

Page

Indicator 1: Accuracy of DOAS equipment compared with traditional equipment.....	3
Indicator 2: Accuracy of roadside description, air models	3
Indicator 3: Accuracy of roadside description, Noise models.....	3
Indicator 4: Testing processes of DSS interfaces	4
Indicator 5: Testing DSS modelling and forecasting processes	7
Indicator 6: Testing DSS operator interface and scenario processes	8
Indicator 7: Testing the functioning of the main system components and their interaction.....	10
Indicator 8: User acceptance by professional users.....	11
Indicator 9: User acceptance by the general public	13

LOCAL VERIFICATION RESULTS OF ROME

Indicator 1: Accuracy of DOAS equipment compared with traditional equipment

This indicator is not applicable for Rome.

Indicator 2: Accuracy of roadside description, air models

On only one road type measurements were done, since the prevalent typology of roads in the demonstration area is street canyons.

Road type X: via Magna Grecia, an inner urban road

LOCATION X: via Magna Grecia

Which organisation (s) did the testing?	STA, The Municipality of Rome, University of Rome "la Sapienza"
When did the testing take place?	January 2002
What pollutants have been measured?	CO, Benzene, NO ₂ , NO _x PM10
What pollutants have been calculated?	CO, Benzene, NO ₂ , TPM

Location X: Magna Grecia

$$\Delta C = \frac{\sum (C_m - C_{calc})}{n} \quad \Delta C_{abs} = \frac{\sum |C_m - C_{calc}|}{n}$$

Open field		ΔC	ΔC_{abs}	Max. ΔC	OK / NOK
NO ₂		- 20%	44%	59%	OK
Benzene		-16%	27%	62%	OK
CO		-32%	41%	46%	OK
TPM		41%	50%	194%	This indicator was not directly involved in verification but just preliminary investigated. Especially because we use TPM emission factors whilst the monitoring station measure PM10.

Indicator 3: Accuracy of roadside description, Noise models

This indicator is not applicable for Rome.

Indicator 4: Testing processes of DSS interfaces

Indicator 4a: Test Interface to Traffic Monitoring Process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	Two days	Number of system failures: 0	95 % of time operational	OK
Operational time	Two days	100 % of total time	95 % of time operational	OK
Correct data in and out, referred to data in monitoring station	A sufficiently large random sampling on the data recorded during 5 days was made	YES, the criterion is fulfilled for all the sampled data	Data in DSS database equals data in monitoring station	OK
Speed	Two days	The process correctly runs every five minutes	Fast enough to allow the whole system to reach a hourly update	OK

To which process(es) does the above table refer?	P6 - Interface between DSS and the Rome MMS System
What method(s) were used for testing?	The software tool that allows transferring data from MMS system and the HEAVEN DSS has been working for the testing period and the corresponding indicator has been calculated
Which organization(s) did the testing?	ELSAG, STA
When did the testing take place?	14 - 18 January 2002
Any other remarks concerning this sub-indicator?	No

Indicator 4b: Test Interface to Meteo Monitoring Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N / A
Number of system failures	Two days	Number of system failures: 0		OK
Operational time	Two days	100 % of total time	> 95 %	OK
Correct data in and out, referred to data in monitoring station	A sufficiently large random sampling on the data recorded during 5 days was made	YES, the criterion is fulfilled for all the sampled data	Data in DSS equals data in monitoring station	OK
Speed	Two days	The process correctly runs	Fast enough to allow the entire system to	OK



		every hour	reach an hourly update	
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To which process(es) does the above table refer?	P7 Interface between DSS and the meteorological data
What method(s) were used for testing?	The software tool that allows transferring data between meteo external system and the Heaven DSS was made running and the related indicator was calculated
Which organization(s) did the testing?	ELSAG Spa
When did the testing take place?	Tests were done between February 25th and March 1st 2002
Any other remarks concerning this sub-indicator?	NO

Indicator 4c: Test Interface to Environmental Monitoring Network Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or not applicable
Number of system failures	Two days	Number of system failures: 0	95 % of time operational	OK
Operational time	Two days	100 % of total time	95 % of time operational	OK
Correct data in and out, referred to data in monitoring station	A sufficiently large random sampling on the data recorded during 5 days was made	YES, the criterion is fulfilled for all the sampled data	Data in DSS database equals data in monitoring station	OK
Speed	Two days	The process correctly runs every hour	Fast enough to allow the entire system to reach a hourly update	OK

To which process(es) does the above table refer?	P7 Interface between DSS and the environmental data providers is involved in this test
What method(s) were used for testing?	The software tool that allows transferring data between environmental sources and the Heaven DSS was made running and the related indicator was calculated
Which organization did the testing?	ELSAG Spa
When did the testing take place?	Tests were done between February 25th and March 1st 2002
Any other remarks concerning this sub-indicator?	NO

Indicator 4d: Test Interface to Static & Infrequently Updated Information Process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	A certain number of times during a testing period of two days	Number of system failures: 0	95 % of time operational	OK*
Operational time	A certain number of times during a testing period of two days	100 % of total time	95 % of time operational	OK*
Correct data in and out, referred to data in source	A certain number of times during a testing period of two days	YES, the criterion is true for all the sampled data	Data in DSS database equals data in monitoring station	OK
Speed	A certain number of times during a testing period of two days	The process correctly allow producing results with five minutes update interval	Fast enough to allow the whole system to reach a hourly update	OK

To which process(es) does the above table refer?	P8 - Interface between DSS and systems that provide static and/or infrequently updated data
What method(s) were used for testing?	The software tool that allows transferring data from MMS system and the HEAVEN DSS has been running for the testing period and the corresponding indicator has been calculated
Which organization(s) did the testing?	ELSAG, STA
When did the testing take place?	14 - 18 January 2002
Any other remarks concerning this sub-indicator?	The data flow involved with this indicator are infrequently updated. So it is not significant to test the indicator for a long period. To test the indicator changes in the data have been simulated and the correct transfer into the database has been verified

Indicator 4e: Test Interface to Information Flow Process

The processes and the data flows involved with this indicator are the same as indicator v.6a

Indicator 5: Testing DSS modelling and forecasting processes

Indicator 5a: Test Air Quality Emission Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	Two days	Number of system failures: 0	95 % of time operational	OK
Operational time	Two days	100 % of total time	95 % of time operational	OK
Speed	Two days	The process correctly runs every five minutes	Fast enough to allow the whole system to reach a hourly update	OK

To which process(es) does the above table refer?	P2 the interface between DSS and the TEE model for pollutant emissions calculation
What method(s) were used for testing?	The process involves the data transfer from the DSS Database into TEE configuration files, the emission calculation, and the transfer of emission data into the DSS database. The process has been working for all the testing period and the corresponding indicator has been calculated
Which organization(s) did the testing?	ELSAG, STA
When did the testing take place?	14 - 18 January 2002
Any other remarks concerning this sub-indicator?	NO

Indicator 5b: Test Air Quality Concentration Process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	Two days	Number of system failures: 0	95 % of time operational	OK
Operational time	Two days	100 % of total time	95 % of time operational	OK
Speed	Two days	The process correctly runs every hour	Fast enough to allow the whole system to be hourly updated	OK

To which process(es) does the above table refer?	P2 the interface between DSS and the ADMS model for pollutant dispersions calculation
What method(s) were used for testing?	The process involves the data transfer from the DSS Database into ADMS configuration files, the concentration calculation, and the transfer of concentration data into the DSS database. The process has been working for all the testing period and the corresponding indicator has been calculated

Which organization(s) did the testing?	ELSAG, STA
When did the testing take place?	14 - 18 January 2002
Any other remarks concerning this sub-indicator?	NO

Indicator 5c: Test Noise Modelling Process

This indicator is not applicable to Rome.

Indicator 5d: Test Traffic Modelling and Forecast Process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	1 day	Number of system failures: 0	100%	OK
Operational time	1 day	100% of total time	100%	OK
Speed	1 day	Assignment: 30 sec Estimation: 10 sec	Fast enough to be hourly updated	OK

To which process(es) does the above table refer?	P1: the process involves OD Matrix Assignment and the O/D Matrix correction
What method(s) were used for testing?	The process involves the OD Matrix Assignment through the traffic measurements retrieval from DSS Database, the Matrix correction, and the corrected traffic data transfer into the DSS Database. The process has been working for all the testing period and the corresponding indicator has been calculated
Which organization(s) did the testing?	ELSAG, STA
When did the testing take place?	14 - 18 January 2002
Any other remarks concerning this sub-indicator?	NO

Indicator 5e: Test Result processing Process

This indicator is not applicable to Rome.

Indicator 6: Testing DSS operator interface and scenario processes

Indicator 6a: Test DSS Operator interface presentation process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	1 day	Number of system failures: 0	100%	OK
Operational time	1 day	100% of total time	100%	OK
Correct data in and out, referred to data in monitoring station	3 queries	YES	Presented data in equals data in DSS	OK

Speed	1 day		Fast enough to reach an hourly update	OK
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To which process(es) does the above table refer?	P5: The process involves the representation of traffic, emission and concentration data on the operator interface
What method(s) were used for testing?	Randomly the correspondence between data stored in HEAVEN DSS and data represented on the interface has been tested
Which organization(s) did the testing?	STA
When did the testing take place?	18 January 2002
Any other remarks concerning this sub-indicator?	This indicator has been verified only for the on-line module, since the scenario module and the scenario interface have been not yet fully developed. Even if the scenario module has been not directly investigated it involves the same processes of the on-line module that has been successfully verified.

Indicator 6b: Test DSS Operator interface intervention process

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	1 day	Number of system failures: 0	100%	OK
Operational time	1 day	100% of total time	100%	OK
Correct data in and out, referred to data in monitoring station				Not applicable
Speed	1 day		OK	OK

To which process(es) does the above table refer?	P5: Operations through the MMI
What method(s) were used for testing?	All the functionality of the interface, traffic representation , emission and concentration representation, zoom, pan, has been verified
Which organization(s) did the testing?	STA
When did the testing take place?	18/01/2002
Any other remarks concerning this sub-indicator?	NO

**Indicator 6c: Test DSS Scenario Process
TO BE DONE**

CRITERION	Test period / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures				
Operational time		% of total time	> 95 %	
Correct data in and out, referred to data in			Data stored in DSS equals scenario data	

monitoring station				
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To which process(es) does the above table refer?	
What method(s) were used for testing?	
Which organization(s) did the testing?	
When did the testing take place?	
Any other remarks concerning this sub-indicator?	

Indicator 7: Testing the functioning of the main system components and their interaction

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	Two days	Number of system failures: 0	100%	OK
Operational time	Two days	100% of total time	100%	OK
Speed	Two days		Fast enough to reach an hourly update	OK

To which process(es) does the above table refer?	This indicator verifies the functioning of the whole system
What method(s) were used for testing?	The system has been made running for two days. Randomly correct data transfer and retrieval from and to DSS, correct functioning of traffic, emission and concentration model have been verified. All interfaces has been verified.
Which organization(s) did the testing?	STA /ELSAG
When did the testing take place?	March 2002
Any other remarks concerning this sub-indicator?	Verification has not included scenario process since the module has not yet been completed.

Indicator 8: User acceptance by professional users

TO BE DONE

Indicator 8a: Does the DSS meet the system requirements as described in WP5?

Questions about Functional Requirements "To which extend are the following requirements implemented satisfactory?" Rating 1-5 (1=not at all satisfactory 5=very satisfactory) When the rating is below 4, please ask explanation	User 1	User 2	User 3	User 4	User 5
Traffic information management					
Does the system support on-line network traffic monitoring through interface with the traffic control and monitoring systems	5	4	5	5	
Does the system support accurate and efficient incident detection?	-	-	-	-	
Does the system support recording of traffic data and formation of historical series and statistics	5	4	5	5	
Does the system support traffic forecasting? ¹	5	5	5	5	
Does the system support traffic demand modelling?		5		4	
Does the system support the optimisation of traffic control? ²	3	3	3	4	
Does the system support the evaluation of short-term and long-term traffic measures?	5	5	4	4	
Does the system support near real-time traffic status representation for the whole demonstration area	5	5	5	4	
Air quality modelling					
Does the system support emissions modelling based on near real-time traffic measurements?	5	5	5	5	
Does the system support emissions modelling based on modelled traffic data?	5	5	5	5	
Does the system support pollutants dispersion modelling at the street and area levels?	5	4	4	4	
Does the system support recording of monitored pollutant levels and modelled data?	5	5	4	5	
Does the system support background pollution modelling?	-	-	-	-	
Does the system support noise modelling at the <i>hotspots</i> ?	-	-	-	-	
Does the system support air quality modelling based on current traffic levels and on predefined traffic and demand management scenarios?	5	5	5	5	
The system shall support evaluation of the environmental effect of short and long term transport policies	5	5	5	4	

EXPLANATION IN CASE OF SCORES LOWER THAN 4

(Please give a detailed explanation and if possible an indication of how your site may be able to improve the situation)

¹ Traffic forecasting is intended only in the scenario module.

² Professional users agree that the system does not allow an optimisation of traffic control, since they states that the evaluation of TDMS strategies through the scenario management allow just to evaluate the consequences of short term policies but not necessarily to optimise traffic.

Indicator 8b: Is the information provided by the system easy to understand?

Questions about understandable information Rating 1-5 (1=not at all satisfactory 5=very satisfactory) When the rating is below 4, please ask explanation	User 1	User 2	User 3	User 4	User 5
Information presentation					
Does the system support data representation via maps, charts and generic tables	4	4	4	4	
Environmental maps					
How do you rate the comprehensibility of the HEAVEN information presentation via <i>maps</i>	5	4	5	5	
How easy to use is the HEAVEN information presentation via <i>maps</i>	5	4	5	5	
How useful is the HEAVEN information presentation via <i>maps</i> to manage urban mobility	4	5	4	4	
How do you rate the comprehensibility of the colour codes used on the <i>maps</i>	5	4	5	5	
Is the level of geographical detail presented in maps satisfactory	5	5	5	5	
Environmental charts and generic tables ³					
How do you rate the comprehensibility of the HEAVEN information presentation via <i>charts and generic tables</i>					
How easy to use is the HEAVEN information presentation via <i>charts and generic tables</i>					
How useful is the HEAVEN information presentation via <i>charts and generic tables</i> to manage urban mobility					
Traffic maps					
How do you rate the comprehensibility of the HEAVEN information presentation via <i>maps</i>	5	5	5	5	
How easy to use is the HEAVEN information presentation via <i>maps</i>	5	5	5	5	
How useful is the HEAVEN information presentation via <i>maps</i> to manage urban mobility	5	4	4	4	
How do you rate the comprehensibility of the colour codes used on the <i>maps</i>	5	5	5	5	
Is the level of geographical detail presented in maps satisfactory	5	5	5	5	
Traffic charts and generic tables ³					
How do you rate the comprehensibility of the HEAVEN information presentation via <i>charts and generic tables</i>					
How easy to use is the HEAVEN information presentation via <i>charts and generic tables</i>					
How useful is the HEAVEN information presentation via <i>charts and generic tables</i> to manage urban mobility					
Health information					
How do you rate the comprehensibility of health information presented	-	-	-	-	-
How easy to use is the health information presented	-	-	-	-	-
Information output					
Does the system deliver reports dealing with model outputs and evaluation of traffic demand management strategies	4	4	4	4	
Does the system support attention and alarm pollutant levels achievement detection and forecast	5	5	5	5	
Is Information presentation driven through a suitable MMI	5	4	5	5	
Are you satisfied with the update interval of the information	5	5	5	5	
Operator interface					
Does the system interface support operator driven scenario definition	5	4	5	5	
Is the system interface for support of operator driven definitions comprehensible?	5	4	5	5	
Is the system interface for support of operator driven definitions easy to use?	5	4	5	5	
Is the system interface for support of operator driven definitions useful to manage urban mobility?	4	5	4	4	
Does the system interface drive the operator through the tasks related to off-line	5	5	5	5	



Questions about understandable information Rating 1-5 (1=not at all satisfactory 5=very satisfactory) When the rating is below 4, please ask explanation	User 1	User 2	User 3	User 4	User 5
evaluation of the impact of scenarios on the environment					
Are these procedures comprehensible	5	5	5	5	
Are these procedures easy to use	5	5	5	5	

EXPLANATION IN CASE OF SCORES LOWER THAN 4 (Please give a detailed explanation and if possible an indication of how your site may be able to improve the situation)
³ Environmental and traffic tables and charts were not available. It has been not possible to evaluate this function of the system.

Indicator 9: User acceptance by the general public

This indicator is not applicable to Rome.