WRITTEN SUBMISSION OF CANADA

Foreign Affairs and International Trade Canada
Assistant Deputy Minister

Affaires étrangères et Commerce international Canada
Sous-ministre adjoint

June 5, 2008

Mr. Feng Gao
Secretary to the Compliance Committee
UNFCCC Secretariat
Martin-Luther-King-Strasse 8
53175, Bonn, Germany

Dear Mr. Gao,

Canada is pleased to submit the attached written submission to the Enforcement Branch of the Compliance Committee as indicated in our notification to you of 20 May 2008 (GDC0024) pursuant to section X, subparagraph 1(b) of the Procedures and mechanisms relating to compliance under the Kyoto Protocol.

Yours sincerely,

Agent for Canada

Keith H. Christie
Assistant Deputy Minister
Global Issues Branch

Enclosures

Canada

WRITTEN SUBMISSION OF CANADA
Under Section X of the Annex to Decision 27/CMP.1
5 June 2008

Question of Implementation
Canada's National Registry System
Under the Kyoto Protocol

Ottawa, 5 June 2008

Gouvernement du Canada Government of Canada

Canada

WRITTEN SUBMISSION

Question of Implementation
Canada's National Registry System
Under the Kyoto Protocol

Written Submission of Canada
Under Section X of the Annex to Decision 27/CMP.1
5 June 2008

SUMMARY

Canada is pleased to present this submission to the Enforcement Branch of the Compliance Committee in response to the Enforcement Branch decision on preliminary examination to proceed with the review of a question of implementation. The question of implementation relates to Canada's national registry and its conformity with the applicable provisions of the Kyoto Protocol and related decisions adopted by the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

Canada is also pleased to report that this question of implementation has now been addressed by Canada. Canada's national registry is now in accordance with Canada's international obligations under the Kyoto Protocol.

I. BACKGROUND

1. Canada submitted its Initial Report under the Kyoto Protocol, as required by decision 13/CMP.1, on 15 March 2007.

2. An in-country review by an expert review team of Canada's Initial Report took place on 5-10 November 2007 and resulted in the preparation of a report of the review of the Initial Report of Canada issued on 11 April 2008 (as found in document FCCC/IRR/2007/CAN).

3. In the report mentioned in paragraph 2 above, the expert review team noted that at the time of the in-country visit in November 2007, Canada had not established a national registry that had initialised with the international transaction log (ITL) by the publication date of the report in April 2008. It invited Canada to expedite work in this area.

4. Given the status of Canada's national registry at the time of publication of the expert review team's report, a question of implementation was identified by the expert review team and was referred by the Secretariat to the bureau of the Compliance Committee for allocation. The bureau, in turn, allocated this question of implementation to the Enforcement Branch of the Compliance Committee.

5. On 2 May 2008, the Enforcement Branch conducted a preliminary examination of this question of implementation and decided to proceed with the further consideration of this question of implementation.

6. Canada is pleased to present this submission in response to the Enforcement Branch decision on preliminary examination conveyed to Canada on 5 May 2008 to proceed with the review of a question of implementation raised in the report by the expert review team (Ref: CC-2008-1-2/Canada/EB) pursuant to rule X.1(b) of the *Procedures and Mechanisms relating to compliance under the Kyoto Protocol* in the annex to decision 27/CMP.1.

7. In its decision on preliminary examination, the Enforcement Branch of the Compliance Committee states that "*[t]he question of implementation relates to compliance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1) and the modalities for the accounting of assigned amounts under article 7, paragraph 4, of the Kyoto Protocol (decision 13/CMP.1)*".

8. Canada is pleased to report that this question of implementation has now been fully addressed as Canada's national registry is now in accordance with articles 6 and 7 of the Kyoto Protocol and decisions 15/CMP.1 and 13/CMP.1.

II. THE FACTS

9. Canada has established a national registry that meets the functional requirements of Article 7 of the Kyoto Protocol and the Data Exchange Standards. All testing of Canada's national registry has been successfully completed. The "Readiness Questionnaire" and supporting documentation was submitted to the ITL service desk on 4 June 2008.

10. Since Canada's *Initial Report* under the Kyoto Protocol (contained in FCCC/IRR/2007/CAN), Canada has worked steadily toward the establishment of a national registry to ensure the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement of emission reduction units (ERUs), certified emission reductions (CERs), assigned amount units (AAUs) and removal units (RMUs) and the carry-over of ERUs, CERs and AAUs.

11. On 5 July 2007, shortly after the unveiling of Canada's *Turning the Corner* plan to reduce greenhouse gases and air pollution, Environment Canada published a *'request for information'* to support the process for procuring a national registry application. Subsequently the *'request for proposals'* was posted on 8 November 2007 and closed on 19 December 2007. Technical evaluation of received bids was completed 14 January 2008 and the contract was awarded to Perrin Quarles Associates (PQA) on 14 February 2008.

12. The testing of Canada's national registry has been successfully completed as follows:

    - 25 January 2008: the virtual private network (VPN) connectivity testing was successfully completed in accordance with section 9.4 of the DES (attached as annex 1)
    - 9 May 2008: Secure Sockets Layer (SSL) connectivity testing was successfully completed in accordance with DES section 3 and Annex h (attached as annex 2)
    - 28 May 2008: "Basic Data Questionnaire" was sent to the ITL service desk as required by the initialization process outlined by the Registry system Administrators Form (attached as annex 3)
    - 29 May 2008: Registry Initialization Process Interoperability Testing Record was successfully completed in accordance with DES Annex h
    - 4 June 2008 : "Readiness Questionnaire" and supporting documentation was provided to the ITL Service Desk

13. In accordance with decision 15/CMP.1, paragraph 32, Canada wishes to provide the following information:

    (a) *Name and contact information of registry administrator*:

    Environment Canada, Legislative and Regulatory Affairs Division

    Primary Contact
    Judith Hull
    Director, Environment Canada Trading Regimes Division
    Judith.hull@ec.gc.ca
    (819) 953-5963
    351 St Joseph Blvd.
    Gatineau, Quebec
    K1A OH3

    Secondary Contact
    Josée Ricard
    Environmental Protection and Climate Change Applications
    Josee.ricard@ec.gc.ca
    (819) 997-1856
    351 St Joseph Blvd.
    Gatineau, Quebec
    K1A OH3

    (b) Names of other Parties with which Canada cooperates by maintaining their national registries in a consolidated system or clarification that no such cooperation yet exists

    In accordance with Decision 15/CMP.1 and article 7 of the Kyoto Protocol, Canada's Kyoto Protocol National Registry (CKPNR) maintains its national registry as a standalone system, and does not maintain a consolidated system with other national registries.

(c) *Description of database structure and capacity of the national registry*

CKPNR is constructed as a *relational database*. In addition to registry core data related to national/legal entity accounts, transactions and user roles, the database contains stored procedures, views and application configuration information that form the major portion of the CKPNR business logic.

The CKPNR database management system operates within a shared infrastructure environment of Environment Canada that comprises clustered Microsoft SQL[1] 2005 Servers. These servers are attached to a Storage Area Network (SAN) consisting of Redundant Array of Independent Disks (RAID) storage devices for reliability and built-in automated fault-tolerance. Data storage capacity for the CKPNR can be augmented by adding physical hard drives to the SAN as necessary.

User access to the CKPNR is accomplished via two (2) web/application servers operating in a load-balancing mode to prevent overloading of a single web server. As user loads increase, additional servers can be added to the load-balancing infrastructure.

Existing server hardware is replaced on a 4-year cycle and augmented based on forecast demand. Forecast demand is determined as a result of new or updated application system requirements.

The Environment Canada software infrastructure is kept current. This means that major software components of the infrastructure are upgraded within one to two years after a major product release. Emergency patches are implemented on an as-needed basis.

(d) *Description of how the national registry conforms to the technical standards for data exchange between registry systems for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the clean development mechanism registry and the transaction log (decision 19/CP.7, paragraph 1),)*

CKPNR was developed by Perrin Quarles Associates (PQA), the company that developed the Clean Development Mechanism Registry and New Zealand's national registry. Environment Canada's contract with PQA stipulates that PQA must deliver a registry application that meets the Data Exchange Standards (DES), and it has successfully done so.

CKPNR includes functionality to perform reconciliation with the ITL, data logging requirements, issuance, conversion, retirement, external transfer, cancellation, replacement, retirement, carry-over, expiry date change, internal transfer between holding accounts, and all other functionality required by the DES V 1.1.

[1] The name "SQL Server 2005" is a registered trademark and is the official name of the database management system in use.

CKPNR has participated in the weekly cyclical testing with the ITL in the 'registry environment' since the week of 11 May 2008 to test the functionality of CKPNR and its consistency with the DES. During this period, the Environment Canada staff responsible for the operation of the registry received comprehensive training from PQA on the functionality and operation of CKPNR.

Interoperability testing of CKPNR in accordance with DES Annex h was successfully completed on 29 May 2008. The successful completion of this testing demonstrates that CKPNR operates in a manner that is accurate, transparent, efficient, and consistent with Decision 13/CMP.1 and Article 7, paragraph 4 of the Kyoto Protocol.

(e) *Description of the procedures employed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units (including the issuance, transfer, acquisition, cancellation and retirement of ERUs, CERs, tCERs, lCERs, AAUs and/or RMUs, and replacement of tCERS and lCERs), the steps taken to terminate transactions where a discrepancy is notified and the correction of problems in the event of a failure to terminate the transactions*

Before any transaction is processed, the CKPNR provides the user with a summary of the proposed transaction or activity. The operator is then required to enter their password to certify their decision to proceed with the transaction or activity.

All transactions processed by registry staff will require the approval of two registry staff, one of which must be at least at the level of "Head". The Head position directly supervises the operational staff of the registry and can configure certain parameters of CKPNR through the Registry Management Application. The operational staff of the registry will only have access to CKPNR through the web interface.

In addition, the application will not allow an operator to propose any transactions that are not permitted by the Data Exchange Standards. For example, the application will only allow lCERs affected by a type 4 reversal of storage notification to be transferred to the Mandatory Cancellation Account; any other proposed transaction (e.g. transfer to another national registry) would not be submitted to the ITL and the user would be notified why the transaction was not sent to the ITL.

In addition, the application prevents an operator from proposing many transaction types that are prohibited by Data Exchange Standards. For example, the application will only allow lCERs affected by a type 4 reversal of storage to be transferred to the Mandatory Cancellation Account. Any other proposed transaction involving the affected lCERs would not be submitted to the ITL, and the user would be notified of the reason for not submitting the transaction to the ITL. Another example of these internal checks is that no transaction that would reduce the holdings of CKPNR below Canada's commitment period reserve level would be submitted to the ITL.

The CKPNR includes rollback functionality that allows the registry administrator to terminate and reverse transactions when notified to do so by the ITL. This process and any other manual intervention process are implemented through a structured process in the CKPNR web interface. All manual intervention actions are automatically logged by the registry software.

(f) Overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error and of how these measures are kept up to date

Physical Security

- Access to the building housing the CKPNR is permitted to persons holding a valid security pass.
- Twenty-four (24) hour security is provided for the building.
- All core equipment hosting the CKPNR is housed in a single air-conditioned server room.
- Access to the area is restricted via coded door locks to IT operations staff for the purpose of equipment maintenance.
- The server room is protected against fire by an automated fire-suppression system.
- All CKPNR-related data communications entering and exiting the server room is encrypted.
- The following CKPNR-related equipment is stored in the secured area:
    - virtual private network (VPN),
    - communications switches,
    - web server load-balancing devices,
    - web servers,
    - application servers,
    - database servers,
    - storage area network (SAN), and
    - all cabling connecting above devices.

Data Security

- All Environment Canada database servers, including those hosting the CKPNR, are protected by an internal hardware-based firewall.
- Communication between the CKPNR and the ITL is encrypted using an ITL-approved digital certificate.
- Communications between CKPNR users and the CKPNR application server is encrypted using a digital certificate.
- Anti-virus software is installed to protect the EC shared infrastructure. Anti-virus updates are installed as required.
- Access to the CKPNR is permitted only to registered and authorized users. Each CKPNR user is required to use a user id/password combination to gain access to the CKPNR. The password is known only to the user. User authentication is augmented by the use of a digital certificate.
- The composition of passwords for the production version of the registry will meet the following requirements:

1. a minimum of 8 characters,
2. include at least three of the following four:
    - uppercase,
    - lowercase,
    - numbers,
    - keyboard characters,
3. must be replaced every 180 days,
4. the last 10 passwords may not be reused.

Prevention of Operator Error

To prevent operator error before any transaction is processed, the application provides the operator with a summary of the proposed transaction or activity. The operator is then required to enter their password to certify their wish to proceed with the transaction or activity.

In addition, the application will not allow an operator to propose any transactions that are not permitted by the Data Exchange Standards. For example, the application will only allow lCERs affected by a type 4 reversal of storage notification to be transferred to the Mandatory Cancellation Account; any other proposed transaction (e.g. transfer to another national registry) would not be submitted to the ITL and the user would be notified why the transaction was not sent to the ITL.

All transactions processed by registry staff will require the approval of two registry staff, one of which must be at least at the level of "Head". The Head position directly supervises the operational staff of the registry and can configure certain parameters of CKPNR through the Registry Management Application. The operational staff of the registry will only have access to CKPNR through the web interface.

Audit Log

All database manipulation actions by users are captured in an Audit Log.

The Audit Log records the following information:

1. the identity of the user making the change;
2. date and time of the change;
3. the field being changed; and
4. the old and new values of the field.

(g) List of the information publicly accessible by means of the user interface to the national registry

The following information will be publicly accessible once CKPNR begins live operation with the ITL:

1. Account information as required by para 45, ANNEX, Decision 13/CMP.1.
2. Article 6 project information as required by para 46, ANNEX, Decision 13/CMP.1.

3. Kyoto units information as required by para 47, ANNEX, Decision 13/CMP1. (this information will be published with a delay of at least one calendar year)
4. Legal entities information as required by para 48, ANNEX, Decision 13/CMP.1.

(h) Internet address of the interface to its national registry

https://rncpk-ckpnr.ec.gc.ca.

This website will be publically available once live implementation of CKPNR begins.

(i) Description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a Disaster

Component Failure

The CKPNR operates in a 'fail-over' mode. This is accomplished with the following four (4) mechanisms:

1. Redundant web/application servers
   The CKPNR application and web services are hosted in a load-balancing environment comprised of two independent servers. If one server fails, application transactions are automatically transferred to the other server.

2. Redundant database servers
   The CKPNR database operates within a cluster of two (2) database servers (more can be added if additional capacity or redundancy is required). If one server fails, database transaction processing is automatically transferred to the second server.

3. Storage Area Network
   The CKPNR database cluster stores CKPNR data on a Storage Area Network (SAN). The database servers are connected to the SAN using redundant fabric switches. The SAN utilizes Redundant Array of Independent Disks (RAID) technology to ensure that data loss as a result of disk failure is automatically recovered.

4. Power Failure
   All components housing the CKPNR operate from a standard grid power supply. In the event of a power failure a battery-driven Uninterruptable Power Supply (UPS) is automatically engaged, followed by a standby diesel power generator that will provide uninterrupted electricity for a maximum of sixteen (16) hours. Each database server power supply is connected to redundant UPS devices.

Network Server Data Backup

As previously stated, the CKPNR is hosted within an Environment Canada shared infrastructure. Standard operational doctrine is to perform daily "incremental" backups weekly and monthly "full" backups of all application and database servers. In addition to server backups, the CKPNR database maintains a separate hourly transaction log

Backup Data Retention

Backup media is recycled on a thirty (30) day basis. Weekly backups are transferred to a remote and secure off-site storage area every week.

Data Recovery

Restoration of data will be accomplished by restoring the appropriate "full" and "incremental" backups, followed by the restoration of database transactions up to the point of failure.

Disaster Recovery

The CKPNR is not currently in production and does not have any external users. At this time, disaster recovery comprising restoration using data from full/incremental backup media is considered to be adequate. As the system moves to production and access is made available to external users and transaction volumes grow the disaster recover process will be re-evaluated on an ongoing basis.

(j) Results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems.

1. Connectivity testing
    i. Virtual Private Network (VPN) testing was successfully completed on 25 January 2008. VPN test results are attached in Annex 1.
    ii. Secure Socket Layer (SSL) testing was successfully completed on 9 May 2008. SSL test results are attached in Annex 2.

2. Environment Canada formal user acceptance testing of CKPNR functionality was successfully completed 28 May 2008.

3. Interoperability testing (DES annex h) was successfully completed on 29 May, 2008.

14. Canada's national registry is also in compliance with the requirements listed under decision 13/CMP.1. In accordance with paragraph 19, CKPNR is in the form of a standardized electronic database which contains, *inter alia*, common data elements relevant to the issuance, holding, transfer, acquisition, cancellation and retirement of ERUs, CERs, AAUs and RMUs and the carry-over of ERUs, CERs and AAUs. The structure and data formats of the CKPNR conforms to technical standards adopted by the COP/MOP for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries,

the Clean Development Mechanism (CDM) Registry and the international transaction log.

15. In accordance with paragraph 20 of decision 13/CMP.1, CKPNR is designed to ensure each ERU, CER, AAU and RMU is held in only one registry at a given time.

16. In accordance with paragraph 21 of decision 13/CMP.1, CKPNR has the following accounts:

    (a) One holding account for Canada.

    (b) One holding account for each legal entity authorized by Canada to hold ERUs, CERs, AAUs and/or RMUs under its responsibility once live operation of the CKPNR begins.

    (c) One cancellation account for each commitment period for the purposes of cancelling ERUs, CERs, AAUs and/or RMUs under paragraph 12(d) of decision 13/CMP.1.

    (d) One cancellation account for each commitment period for the purposes of cancelling ERUs, CERs, AAUs and/or RMUs under paragraph 12(e) of decision 13/CMP.1.

    (e) One cancellation account for each commitment period for the purposes of cancelling ERUs, CERs, AAUs and/or RMUs under paragraph 12(f) of decision 13/CMP.1 (i.e. for voluntary cancellation).

    (f) One retirement account for each commitment period.

17. In accordance with paragraph 22 of decision 13/CMP.1, each account within Canada's national registry has an account number comprising a Party identifier (CA) and a number unique to that account defined in accordance with the current version of the DES.

IV. CONCLUSION

18. Based on the establishment of Canada's national registry including the successful completion of all technical testing on 29 May 2008 and the transmission of Canada's 'Readiness Questionnaire' to the ITL Service Desk on 4 June 2008, Canada respectfully invites the Enforcement Branch of the Compliance Committee to decide not to proceed further pursuant to paragraph 1 (d) of section X of the Procedures and Mechanisms relating to compliance under the Kyoto Protocol found in the annex to decision 27/CMP.1. Canada further invites the Enforcement Branch to find Canada in compliance with Article 7 the Kyoto Protocol (decision 15/CMP.1) and the modalities for the accounting of assigned amounts under article 7, paragraph 4, of the Kyoto Protocol (decision 13/CMP.1).

LIST OF ANNEXES

ANNEX 1 –VPN TESTING DOCUMENTATION (ATTACHED)

ANNEX 2 –SSL TESTING DOCUMENTATION (ATTACHED)

ANNEX 3 –CANADA'S COMPLETED REGISTRY BASIC DATA QUESTIONNAIRE (ATTACHED)

UNFCCC ITL
VPN Connectivity Testing

Customer	:	UNFCCC	
Project Manager	:	Stuart Parsons	
Reporting to	:	Harvey Bolton	
Project/document reference	:	UNFCCC ITL VPN Connectivity Acceptance Tests	
Issue	:	0.4	
Issue date	:	25/06/2007	
Period of validity	:		
Status	:	*Live*	
Distribution	:	Stuart Parsons	LogicaCMG
		Harvey Bolton	LogicaCMG
		Robert Brown	LogicaCMG
		David Sturt	UNFCCC

Prepared by	:	Osa Olaye	Date: 25-06-2007
Reviewed by	:	Robert Brown	Date: 26-06-2006
Approved (LogicaCMG)	:	Stuart Parsons	Date: 26-06-2007
Agreed (Customer)	:	David Sturt	Date:

Amendment history

date	issue	status	author
06 – 11 - 2006	0.1	Initial draft of document	Osa Olaye
08 –02 – 2007	0.2	Updated post internal review	Stuart Parsons
08/05/2007	0.3	Reviewed	Stuart Parsons
25/06/2007	0.4	Reviewed post UNFCCC	Osa Olaye

Detailed contents

1 Introduction

1.1 Purpose

This document defines the tests that will be performed to ensure that the VPN communication between the ITL hub and UNFCCC Registries is configured correctly, as per the design specification and standards, and is operational between sites.

1.2 Scope

This document covers the testing of the VPN connectivity between the Registries and the ITL production and initialisation Hub systems hosted by LogicaCMG. This document forms part of the "UNFCCC ITL Registries Site to Site VPN" documentation as per the initialisation process.

This document is a generic template document and a specific document for each registry will need to be created.

1.3 Process Overview

This testing process forms part of the overall VPN connectivity setup of the initialisation process.

This document cannot be started until the VPN equipment is configured at both sites. The comprehensive set of connectivity tests will then be carried out to ensure the equipment has been configured correctly. Checks will also be carried out to make certain that the appropriate external/internal communications links are available.

1.4 Roles & Responsibilities

The roles and responsibilities are as follows:

- Project Manager, responsible for management of the tests, and for final sign-off
- Test Manager, responsible for the scope of testing and approving the test description and results.
- Implementation Team, responsible for defining and executing the tests, and recording test failures

1.5 Observation Reports

An Observation Report is to be raised for every variance from the test script expected results.

The following information will be entered:

Form Field	Description
Observation Number	Prefixed with a unique reference to the test specification: [redacted]
Priority	• **High** - Serious error, unable to continue with test script. • **Medium** - Error requiring resolution, may be possible to continue with test script. • **Low** - Variation from expected results, can continue with test script, may not need a configuration change.
Retest	Flag to indicate this test needs to be re-run after a correction has been made.
Observation Detail	The text should be as descriptive as possible to assist in diagnosis. This should include (where appropriate): • Version numbers of configuration • Error codes and associated messages • Screen dumps
Diagnosis	A description of the action required to resolve the error. This should include (where appropriate): • Affected files or configurations • Type of change required, • Projected effort to resolve the problem
Change request	• Internal (implementation) or External (Client Authorisation required) • Description of action required • Date due • Designated authority

Double asterisk (**) and ***Blue Font*** has been used to highlight the actions that the Registry is required to carry out.

2 Test Description

2.1 Confirm VPN IP Details

Test No.	VPN-01
Function Area	Confirm Configuration Details
Objective	Confirm VPN IP Details

Device – VPN Endpoint

Test Seq. No.	Action	Expected Result	Pass/ Fail	Observation No (if fail)
01.	Confirm IP Address of ITL VPN Endpoint for [redacted]	[redacted]	PASS PASS	
02.	**Confirm IP Address of Registry VPN Endpoint.	[redacted]	PASS	
03.	Confirm the ITL Encryption Domain	[redacted]	PASS PASS	
04.	**Confirm the Encryption Domain for the Registry	[redacted]	PASS	
05.	**Confirm the Registry is [redacted]	[redacted]	PASS	

Double asterisk (**) and *Blue Font used to highlight Registry actions

2.2 Confirm VPN Phase 1 Details

Test No.	VPN-02
Function Area	Confirm Configuration Details
Objective	Confirm Phase 1 Details

Device – VPN Endpoint

Test Seq. No.	Action	Expected Result	Pass/ Fail	Observation No (if fail)
01.	**Confirm If [redacted]	[redacted]	PASS	
02.	**Confirm Digital Certificate has been Enrolled for.	[redacted]	PASS	
03.	**Confirm Digital Certificate has been Approved.	[redacted]	PASS	
04.	**Confirm Digital Certificate has been installed.	[redacted]	PASS	
05.	**Confirm the hostname [redacted]	[redacted]	PASS PASS	

06.	**Confirm the [redacted].	[redacted]		PASS	
07.	**Confirm Phase [redacted]	[redacted]		PASS	
08.	**Confirm Phase [redacted]	[redacted]		PASS	
09.	**Confirm Phase [redacted]	[redacted]		PASS	
10.	**Confirm Phase [redacted]	[redacted]		PASS	
11.	**Confirm Phase [redacted]	[redacted]		PASS	
12.	**Confirm Phase [redacted]	[redacted]		PASS	

Double asterisk (**) and *Blue Font used to highlight Registry actions

2.3 Confirm VPN Phase 2 Details

Test No.	**VPN-03**			
Function Area	**Confirm Configuration Details**			
Objective	**Confirm Phase 2 Details**			
Device – VPN Endpoint				
Test Seq. No.	**Action**	**Expected Result**	**Pass/ Fail**	**Observation No (if fail)**
01.	**Confirm Phase [redacted]	[redacted]	PASS	
02.	**Confirm Phase [redacted]	[redacted]	PASS	
03.	**Confirm Phase [redacted]	[redacted]	PASS	
04.	**Confirm Phase [redacted]	[redacted]	PASS	
05.	**Confirm Phase [redacted]	[redacted]	PASS	
06.	**Confirm Phase [redacted]	[redacted]	PASS	

Double asterisk (**) and *Blue Font used to highlight Registry actions

2.4 Confirm VPN Routing Details

Test No.	VPN-04			
Function Area	Confirm Configuration Details			
Objective	Confirm Routing Details for VPN Tunnel			
Device – VPN Endpoint				
Test Seq. No.	**Action**	**Expected Result**	**Pass/ Fail**	**Observation No (if fail)**
01.	Confirm [redacted]	[redacted]	PASS	
02.	Confirm [redacted]	[redacted]	PASS	
03.	**Confirm Route [redacted]	[redacted]	PASS	
04.	Confirm [redacted]	[redacted]	PASS	
05.	**Confirm [redacted]	[redacted]	PASS	
06.	**Confirm [redacted] Registry Site	[redacted]	PASS	

2.5 Confirm VPN Firewall Rules Details

Test No.	VPN-05			
Function Area	Confirm Configuration Details			
Objective	Confirm Firewall Rules for VPN Tunnel has been setup.			
Device – VPN Endpoint				
Test Seq. No.	**Action**	**Expected Result**	**Pass/ Fail**	**Observation No (if fail)**
01.	**Confirm [redacted] between Registry VPN endpoint and ITL Hub VPN endpoint at both sites.	[redacted]	PASS	
02.	Confirm rule [redacted]	[redacted]		* Access to production restricted
03.	Confirm rule [redacted]	[redacted]	PASS	
04.	**Confirm rule [redacted]	[redacted]	PASS	
05.	**Confirm the above rules are [redacted]	[redacted]	PASS	

ouble asterisk (**) and *Blue Font used to highlight Registry actions

2.6 Test VPN Connectivity

Test No.	VPN-06
Function Area	Test VPN Connectivity
Objective	Establish VPN Tunnel to test connectivity

Device – VPN Endpoint

Test Seq. No.	Action	Expected Result		Pass/ Fail	Observation No (if fail)
01.	**Telnet on [redacted] from an agreed Registry server to [redacted]. Repeat [redacted] times	[redacted]		PASS	Access to production restricted
02.	Check the Public Firewall logs at [redacted]	[redacted]		PASS	
03.	**Confirm Phase 1 is established at both sites.	[redacted]		PASS	
04.	**Confirm Phase 2 is established at both sites.	[redacted]		PASS	
05.	**Confirm routing is working as expected at both sites	[redacted]		PASS	

06.	**Confirm [redacted] at the Registry site.	[redacted]		PASS	
07.	Check the Internal Firewall logs at the ITL site for [redacted]	[redacted]		PASS	
08.	Clear the SA tunnels at both sites	[redacted]		PASS	

Double asterisk (**) and *Blue Font used to highlight Registry actions

COMPLETED VPN CONNECTIVITY TEST SIGN OFF			
Test Completed / Registry Sign-Off	**Registry's Implementation Team**	**Full Name** *Aubin Guillemette / Allan James*	**Signature & Date** ***24-01-2008***
Test Completed / ITL Administrator Sign-Off	**Implementation Team**	**Full Name** *Osa Olaye*	**Signature & Date** ***24-01-2008***
Technical Sign-off / SDM Informed	**Implementation Team**	**Full Name** *Osa Olaye /Stuart Parsons*	**Signature & Date** ***24-01-2008***
Documentation Updated	**Test Manager**	**Full Name** *Osa Olaye*	**Signature & Date** ***24-01-2008***
VPN Connectivity Test Sign-Off	**Service Provision Manager**	**Full Name** *Harvey Bolton*	**Signature & Date** ***24-01-2008***

UNFCCC ITL
SSL Connectivity Testing

Customer	:	UNFCCC	
Project Manager	:	Stuart Parsons	
Reporting to	:	Harvey Bolton	
Project/document reference	:	ITL/SSL/02	
Issue	:	0.5	
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Distribution	:	Stuart Parsons	LogicaCMG
		Harvey Bolton	LogicaCMG
		Robert Brown	LogicaCMG
		David Sturt	UNFCCC

Prepared by	:	Osa Olaye	Date: 03-10-2007
Reviewed by	:	Joel Smith	Date: 03-10-2007
Approved (LogicaCMG)	:	Stuart Parsons	Date: 03-10-2007
Agreed (Customer)	:	David Sturt	Date:

Amendment history

date	issue	status	author
20/04/2007	0.1	Initial draft of document	Osa Olaye
03/05/2007	0.2	Updated post internal review	Joel Smith
03/05/2007	0.3	Reviewed	Stuart Parsons
11/05/2007	0.4	Reviewed post UNFCCC	Osa Olaye
03/10/2007	0.5	Updated for Production Tests	Osa Olaye

Detailed contents

1 Introduction

1.1 Purpose

This document defines the tests that will be performed to ensure that bi-directional 2-way SSL (Secure Sockets Layer) communication between Registries and the UNFCCC International Transaction Log (ITL) is configured correctly, as per the design specification

The document contains a template for completion to record the various stages of the testing process. It is intended that this template will be completed by the Logica staff member assigned to assist in the SSL Connectivity testing.

1.2 Process Overview

The testing process forms part of the overall SSL Connectivity setup.

The test procedure presented in this document cannot be started until the VPN connection between the Registry and ITL has been established and the SSL client and server certificates have been generated and installed on the Registry systems.

The comprehensive set of connectivity tests as identified in this document will then be performed to ensure that the SSL certificates are installed correctly and that bidirectional 2-way SSL communication is established and passes the acceptance tests.

1.3 Roles & Responsibilities

The roles and responsibilities are as follows:

- Project Manager, responsible for scheduling and management of the tests, and for final sign-off.
- Test Manager, responsible for the scope of testing and approving the test description and results.
- Implementation Team, responsible for defining and executing the tests, and recording test failures.

1.4 Observation Reports

An Observation Report will be raised detailing the results for each step of the SSL Connectivity process. This will be completed by the Test Manager.

The following information will be entered:

Form Field	Description
Observation Number	Prefixed with a unique reference to the test specification: [redacted] Followed by the test identification number and a sequential number for the Observation raised e.g.: SSL01.02-02 where: - SSL Test Deployment 01 Test number 01 02 Test Sequence number 02 02 2nd Observation for the test sequence
Priority	• **High** - Serious error, unable to continue with test script. • **Medium** - Error requiring resolution but it may be possible to continue with test script. • **Low** - Variation from expected result, can continue with test script, may not need a configuration change.
Retest	Flag to indicate this test needs to be re-run after a correction has been made.
Observation Detail	The text should be as descriptive as possible to assist in diagnosis. This should include (where appropriate): • Version numbers of configuration • Error codes and associated messages • Screen dumps
Diagnosis	A description of the action required to resolve the error. This should include (where appropriate): • Affected files or configurations • Type of change required, • Projected effort to resolve the problem
Change request	• Internal (implementation) or External (Client Authorisation required) • Description of action required • Date due • Designated authority

Double asterisk (**) and ***Blue Font*** has been used to highlight the actions that the Registry is required to carry out.

2 Test Description

2.1 Confirm Registry SSL Server and Client Certificate Details

Test No.	**SSL-01**
Function Area	**SSL Server Certificate Details**
Objective	**Confirm Registry's SSL Server Certificate ([redacted]r) is installed properly**

Device – Registry Server Endpoint

Test Seq. No.	Action	Expected Result		Pass/ Fail	Observation No (if fail)
01.	** Confirm Registry has requested and installed a [redacted]SL Certificate.	[redacted]		Pass	
02.	** Confirm the Common Name of the Registry's SSL Certificate.	[redacted]		Pass	
03.	** Confirm SSL Certificate appears in the Personal certificate store of Registry Server.	[redacted]		Pass	
04.	** Check the SSL certificate's general properties attributes.	[redacted]		Pass	
05.	** Check the SSL Certificate's ***Certification Path Chain***.	[redacted]		Pass	

06.	** Confirm Intermediate CA is installed in the [redacted] store of Registry Server.	[redacted]		Pass	
07.	** Confirm the specific [redacted] for the Registry Server from the allocated range.	[redacted]		Pass	
08.	** Confirm the [redacted] the Registry Server is listening on.	[redacted]		Pass	
09.	Confirm the ITL [redacted]	[redacted]		Pass	
10.	** Confirm the steps in Test Seq. No. 1 – 9 have been completed for each environment hosted by the Registry.	[redacted]		Pass	

Double asterisk (**) and *Blue Font used for Registry Actions

Test No.	SSL-02
Function Area	Client Certificate Details
Objective	Confirm Registry's Client Certificate (VeriSign MPKI Lite) is installed properly

Device – Registry Server Endpoint

Test Seq. No.	Action	Expected Result	Pass/ Fail	Observation No (if fail)
01.	** Confirm the Registry has enrolled for and installed a [redacted]	[redacted]	Pass	
02.	** Confirm the ***Common Name*** and ***Organisation Name*** of the Registry's Client Certificate.	[redacted]	Pass	
03.	** Confirm Client Certificate appears in the Personal certificate store of Registry Server.	[redacted]	Pass	
04.	** Check the Client certificate's general properties attributes.	[redacted]	Pass	
05.	** Check the Client Certificate's ***Certification Path Chain***.	[redacted]	Pass	

06.	** Confirm that the Root CA is installed in the ***Trusted Root Certificate Authority*** store of the Registry Server.	[redacted]	Pass	
07.	Confirm the mapping on the ITL Big IP Load Balancer has been setup for the Client certificate.	[redacted]	Pass	
08.	** Confirm that the Registry Server is setup to require Client Certificates.	[redacted]	Pass	
09.	** Confirm that the Registry Server is setup to trust Client Certificates issued by the CA: [redacted]	[redacted]	Pass	
10.	** Confirm the Registry Server has access to the [redacted]	[redacted]	Pass	
11.	** Confirm the steps in Test Seq. No. 1 – 9 have been completed for each environment hosted by the Registry.	[redacted]	Pass	

Double asterisk (**) and *Blue Font used for Registry Actions

2.2 Test Registry's SSL Server and Client Certificate

Test No.	**SSL-03**
Function Area	**Connectivity Test to SSL Server Certificate**
Objective	**Test SSL connectivity to the Server certificate installed on the Registry Server**

Device – Registry Server Endpoint

Test Seq. No.	Action	Expected Result	Pass/ Fail	Observation No (if fail)
01.	** Registry to confirm details of any test page hosted on their server that the ITL could access using a web browser.	[redacted]	Pass	
02.	** Registry to confirm [redacted] from ITL servers to their server.	[redacted]	Pass	
03.	ITL to confirm [redacted] from ITL servers to Registry server.	[redacted]	Pass	
04.	ITL administrator to launch web browser on both [redacted]	[redacted]	Pass	

05.	ITL administrator to type the Registry's test URL details into the web browser.	[redacted]	Pass	
06.	ITL administrator required to select the Client Certificate installed on the server and click OK.	[redacted]	Pass	
07.	ITL administrator required to check the certificate properties/details.	[redacted]	Pass	
08.	ITL administrator to accept the SSL security alert message.	[redacted]	Pass	
09.	** Registry to confirm the URL details for their [redacted] Services where applicable.	[redacted]	Pass	
10.	ITL Administrator to confirm the equivalent URL details for the Registry is updated on the ITL-AA application server.	[redacted]	Pass	
11.	ITL Administrator to start a tcp packet trace on the BigIP Load Balancers and enable logging on firewalls.	[redacted]	Pass	
12.	** Registry to start a tcp packet trace (capture) and enable logging on firewalls.	[redacted]	Pass	Trace performed by Logica
13.	ITL to send a ***Provide Time*** request to the Registry server.	[redacted]	Pass	

14.	ITL and Registry to stop tcp packet trace and analyse the result. ** Registry to confirm the [redacted] slightly between software vendors.	[redacted]		Pass	
15.	** Registry to confirm their Application logs recorded the ***Provide Time*** request	[redacted]		Pass	Delta Time = 1.8sec

Test No.	**SSL-04**
Function Area	**Client Certificate connectivity Test**
Objective	**Test SSL connectivity to the ITL using the Client Certificate installed on the Registry Server**

Device – Registry Server Endpoint

Test Seq. No.	Action	Expected Result		Pass/ Fail	Observation No (if fail)
01.	ITL to confirm details of the test URL page for each environment the Registry will access. Registries without the ability to test SSL connectivity using a browser should go to ***Test Seq. No 10***	[redacted]		Pass	
02.	**Registry to confirm their production servers are setup to use the [redacted] servers.	[redacted]			DNS not setup. Host Files in use
03.	**Registry to confirm Firewall access allowed to the ITL servers from their server.	[redacted]		Pass	
04.	ITL to confirm [redacted]lowed for the Registry's NAT range.	[redacted]		Pass	
05.	**Registry administrator to launch web browser on their server.	[redacted]		Pass	
06.	**Registry administrator to type the ITL test URL details into the web browser.	[redacted]		Pass	

07.	**Registry administrator required to select the appropriate Client Certificate installed on the server and click OK.	[redacted]		Pass	
08.	**Registry administrator required to check the certificate properties/details.	[redacted]		Pass	
09.	**Registry administrator to accept the SSL security alert message.	[redacted]		Pass	
10.	ITL to confirm for each environment the URL details for the Transaction Log and Account Management Services where applicable.	[redacted]		Pass	
11.	**Registry to confirm the equivalent URL details for the ITL is updated on their servers.	[redacted]		Pass	
12.	ITL Administrator to start a tcp packet trace on the BigIP Load Balancers and enable logging on firewalls.	[redacted]		Pass	
13.	**Registry to start tcp packet trace (capture) and enable logging on firewalls.	[redacted]		Pass	Trace performed by Logica

14.	**Registry to send a ***Get Transaction Status Message, Proposal Request Message*** or ***Text Message*** to the ITL server.	[redacted]		Pass	
15.	ITL and Registry to stop tcp packet trace and analyse the result. **Registry to confirm the Web Service software they are using as the exact tcp flow differs slightly between software vendors.	[redacted]		Pass	
16.	ITL administrator to confirm the Application logs recorded the ***Get Transaction Status*** message.	[redacted]		Pass	

Double asterisk (**) and *Blue Font used for Registry Actions

COMPLETED SSL CONNECTIVITY TEST SIGN OFF			
Test Completed / Registry Sign-Off	**Registry's Implementation Team**	**Full Name** *Jean-Louis Legros* *Allan James*	**Signature & Date** ***09-05-2008*** ***09-05-2008***
Test Completed / ITL Administrator Sign-Off	**Implementation Team**	**Full Name** *Osa Olaye*	**Signature & Date** ***09-05-2008***
Technical Sign-off / SDM Informed	**Implementation Team**	**Full Name** *Osa Olaye*	**Signature & Date** ***09-05-2008***
Documentation Updated	**Test Manager**	**Full Name** *Osa Olaye*	**Signature & Date** ***09-05-2008***
SSL Connectivity Test Sign-Off	**Service Provision Manager**	**Full Name** *Harvey Bolton*	**Signature & Date** ***09-05-2008***

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UNFCCC International Transaction Log
Registry Initial Questionnaire

This questionnaire is designed to collect information from Registries intending to participate in the International Transaction Log (ITL) service, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat. The information will be used by the service support providers (Trasys and LogicaCMG) to facilitate the Initialization process, contributing to the successful introduction of each Registry into the ITL service in line with agreed schedules. Full and accurate details will also assist the ongoing support of participating Registries within the ITL service, enabling prompt response to any difficulties encountered and a proactive approach to preventing potential problems.

Ref:	*Category*	*Subject*	*Question*	*Response*
1	**Registry**			
1.1		**Organisation & system**	Country or Organisation?	Government of Canada (Environment Canada)
			By what name is your organisation known?	Environment Canada Legislative and Regulatory Affairs Division
			By what name is your Registry system known?	Canada's Kyoto Protocol National Registry (CKPNR)
1.2		**Location**	Where / in which nation is your Registry located?	Canada
			Please provide your full address for correspondence.	351 St Joseph Blvd Quebec, Canada K1A OH3
1.3		**General contact details:**	Please provide the following details:	Judith Hull Director, Environment Canada Trading Regimes Division
			• Telephone number	(819)953-5963
			• Fax number	(819)953-8963
			• Email address	Judith.Hull@ec.gc.ca
1.4		**Time zone:**	Please state GMT +/- hours.	Eastern Standard Time (EST): -5 Eastern Daylight Time (EDT): -4 • November – April: Eastern Standard Time (EST) April – November: Eastern Daylight Time

UNFCCC International Transaction Log
Registry Initial Questionnaire

Ref:	*Category*	*Subject*	*Question*	*Response*
				(EDT)
1.5		**Days/hours of operation**	Please indicate periods when the system will be operational, including uptime / downtime.	User Support Monday to Friday 8:30 am – 4:30pm (EST/EDT) (excluding Canadian Statutory Holidays): • November – April: Eastern Standard Time (EST) • April – November: Eastern Daylight Time (EDT) Downtime: • Mon-Fri: 17:00 – 02:00 Sat 08:00 – Sun 24:00
1.6		**Calendar constraints**	Please identify critical dates/periods (e.g. service deadlines, holidays/reduced service, etc.)	Holidays for the remainder of 2008: June 24, July 1, August 4, September 1, October 13, November 11, December 25 and December 26.

Ref:	*Category*	*Subject*	*Question*	*Response*
2	**Personnel**			
2.1		**Primary (Business) contact:**	Please provide the following details for your business Registry System Administrator. This is the person responsible for day-to-day operation of the Registry:	
			• Name	Christian Weber
			• Role / Job title	Manager, Canada/US Emissions Trading
			• Telephone number	(819)997-0084
			• Fax number	(819)953-8963
			• Email address	Christian.weber@ec.gc.ca
			• Level of training / expertise in registry system (e.g. developer, administrator, user)	Administrator
			• Competence level in English (e.g. native, fluent, proficient, etc.)	native
2.2		**Secondary (Technical) contact:**	Please provide the following details for your technical support. This is the person responsible for technical support of your infrastructure and networking operation of the Registry:	
			• Name	Allan James
			• Role / Job title	IT Project Manager
			• Telephone number	819-934-4581
			• Fax number	
			• Email address	allan.james@ec.gc.ca
			• Level of training / expertise in registry system (e.g. developer, administrator, user)	Administrator
			• Competence level in English (e.g. native, fluent, proficient, etc.)	Native
2.3		**Other possible contacts?**	How many other members of staff are regularly involved on a frequent basis?	Stephen Hairsine, (819) 953-5975 stephen.hairsine@ec.gc.ca

UNFCCC International Transaction Log
Registry Initial Questionnaire

Ref:	*Category*	*Subject*	*Question*	*Response*
3	**Technology**			
3.1		**Registry application:**	By what name is your Registry application generally referred to?	Canada's Kyoto Protocol National Registry (CKPNR)
			Is your registry system product based (e.g. based on a product such as Seringas or Greta) or a bespoke development?	Registry system is product based – PQA EATS based product
			If product based please indicate:	
			• the current version in production that you use	Application is not in production. Version 1.4
			• if an upgrade is required prior to connection to the ITL	No
			• whether the product is customised in any way, other than localisation changes.	No
3.2		**Registry hosting**	Which organisation provides the infrastructure (the hardware, network and software that the registry system runs on) that hosts the production registry application?	Environment Canada, Chief Information Officer Branch
			Where (i.e. geographical location) is it hosted?	Gatineau, Quebec K1A OH3
			Are the pre-production versions hosted on the same infrastructure?	No
			Which organisation is responsible for the day-to-day support and operation of the infrastructure and software?	Environment Canada, Chief Information Officer Branch is responsible for the support and operation of the infrastructure including web/application servers, database administration and telecommunications. The registry supplier is responsible for ongoing support of the software application.
			Do you provide hosting services for other registry	No

Ref:	Category	Subject	Question	Response
			systems on your infrastructure? If so please indicate which registries.	
			Will these Registries share a common VPN connection to the ITL?	N/A
			A registry might be hosted at difference locations for the purposes of resilience. Please indicate how many different sites your Registry is hosted on.	2 sites - Primary - Remote
			Do you conduct pre-production tests from the same infrastructure as production, or a distinct infrastructure?	All pre-production testing is conducted in an environment that is distinct from the production infrastructure.
3.3		**Registry system**:	Which operating system & version does the Registry system run under?	MS Windows Server 2003 SP2
			Which software provides the web (Server) services support, for example: • IIS • J2EE (e.g. WebLogic & WebSphere), or • other, such as Apache Axis. Please clearly state the version of the software.	Microsoft .NET 2005
			Which database system (if any) & version does the Registry system use?	Microsoft SQL Server 2005
3.4		**Architecture:**	Is the Registry system client/server-based or an alternative architecture?	Client/Server – web-browser user interface.
			What separate environments are used? (distinct instances of the registry application such as development, QA/test, production/live)	The product is vendor-supplied. All new versions will be provided by the registry vendor. We utilize four (4) environments at the primary Registry site: • User Acceptance/Quality Assurance /Operational Test/New Version Training,

Ref:	Category	Subject	Question	Response
				• Production Training/Vendor Support • Initialization/Pre-production • Production System
			Which of these environments will connect to the ITL environments for testing purposes?	• User Acceptance/Quality Assurance /Operational Test/New Version Training, • Initialization/Pre-production
3.5		**Volumetrics:**	Please indicate average & peak volumes (based on estimates or 2006 actuals) of:	
			• transaction volumes, number of unit blocks involved, frequency	No previous data to base volumetrics on.
			• data volumes & growth	Would expect increased volume starting in 2010 when Legal Entities will be allowed to use CERs for compliance with domestic GHG regulations.
3.6		**Operating hours**	(please clearly state time zone(s) relevant to response)	
			Please state the hours of operation of the registry server application.	User Support Monday to Friday 8:30 am – 4:30pm (EST/EDT) (excluding Canadian Statutory Holidays): • November – April: Eastern Standard Time (EST) • April – November: Eastern Daylight Time (EDT) Downtime: • Mon-Fri: 17:00 – 02:00 • Sat 08:00 – Sun 24:00
			Please state the hours of service for the registry users,	Service and support for registry users

Ref:	*Category*	*Subject*	*Question*	*Response*
			and the hours support is provided to registry users (if different).	Monday to Friday 8:30 am - 4:30 pm (EST/EDT): • November – April: Eastern Standard Time (EST) April – November: Eastern Daylight Time (EDT)