



**MAIL RESPONSES TO:  
RETOURNER LES RÉPONSES À:**

Hamid Mohammad  
Contracting Authority | Autorité contractante  
Shared Services Canada | Services  
partagés Canada  
180 Kent Street, 13<sup>th</sup> floor, #K073  
Ottawa, Ontario K1P 0B6

**INVITATION TO QUALIFY**

**INVITATION À QUALIFIER**

<b>Title – Sujet</b> DATA CENTRE CO-LOCATION SERVICES (DCCS)	
<b>Solicitation No. – N° de l'invitation</b> 10032992/A	<b>Date</b> 2014-02-07
<b>Client Reference No. – N° référence du client</b> RAS 13-1075	
<b>File No. – N° de dossier</b> CAE10032992	
Solicitation Closes – L'invitation prend fin <b>on – le 2014-02-21</b>	
<b>F.O.B. - F.A.B.</b> Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
<b>Address Inquiries to : - Adresser toutes questions à:</b> Hamid Mohammad	<b>Buyer Id – Id de l'acheteur</b> CAE
<b>Telephone No. – N° de téléphone :</b> 613-716-9792	<b>FAX No. – N° de FAX</b> Not applicable
<b>Delivery required - Livraison exigée</b> See Herein	<b>Delivered Offered – Livraison proposée</b>
<b>Destination – of Goods, Services, and Construction:</b> <b>Destination – des biens, services et construction :</b>  See Herein	

**Comments - Commentaires**

***THIS DOCUMENT CONTAINS A SECURITY  
REQUIREMENT***

***CE DOCUMENT CONTIENT DES EXIGENCES  
RELATIVES À LA SÉCURITÉ***

**Issuing Office – Bureau de distribution**

SSC | SPC  
Procurement and Vendors Relationships |  
Achats et relations avec les fournisseurs  
180 Kent Street, 13<sup>th</sup> floor, #K073  
Ottawa, Ontario K1P 0B6

<b>Vendor/firm Name and address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Facsimile No. – N° de télécopieur</b>	
<b>Telephone No. – N° de téléphone</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/firm</b> <b>(type or print)-</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/de</b> <b>l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>



**INVITATION TO QUALIFY (ITQ)**  
**DATA CENTRE CO-LOCATION SERVICES(DCCS)**  
**FOR**  
**SHARED SERVICES CANADA**

**TABLE OF CONTENTS**

<b>PART 1</b>	<b>GENERAL INFORMATION</b>	<b>3</b>
1.1	Introduction	3
1.2	Overview of the Requirement	4
<b>PART 2</b>	<b>RESPONDENT INSTRUCTIONS</b>	<b>5</b>
2.1	Standard Instructions, Clauses and Conditions	5
2.2	Submission of Responses	6
2.3	Enquiries and Comments	6
2.4	Composition of Core Team	7
<b>PART 3</b>	<b>RESPONSE PREPARATION INSTRUCTIONS</b>	<b>8</b>
3.1	Response Preparation Instructions	8
3.2	Section I: Qualification Response	9
3.3	Section II: Certifications	10
<b>PART 4</b>	<b>EVALUATION PROCEDURES AND BASIS OF QUALIFICATION</b>	<b>10</b>
4.1	Evaluation Procedures	10
4.2	Technical Evaluation - Mandatory Technical Criteria	11
4.3	Basis of Qualification	16
<b>PART 5</b>	<b>CERTIFICATIONS AND AGREEMENTS</b>	<b>17</b>
5.1	Code of Conduct and Certifications – Related documentation	17
5.2	Non-Disclosure Agreement for Incorporation into ITQ	17

**Forms:**

Form 1 - Submission Form

Form 2 - ITQ Reference Project Form

**Annexes:**

Annex A	Procurement Process
Annex C	IT Supply Chain Security Information Form
Annex D	Data Centre Size and Scope Specification
Annex E	Tier III Equivalency of the Proposed Facility - Requirement Checklist
Annex F	Draft RFP
Annex G	Review and Refine Requirements Process Document
Annex H	Glossary of Terms
Annex I	Definition of Terms
Annex J	Uptime Institute Tier Standard Topology



## INVITATION TO QUALIFY (ITQ)

### DATA CENTRE CO-LOCATION SERVICES (DCCS)

#### FOR SHARED SERVICES CANADA

#### PART 1 GENERAL INFORMATION

##### 1.1 Introduction

This Invitation to Qualify (ITQ) is neither a Request for Proposal (RFP) nor a solicitation of bids or tenders and is intended only to pre-qualify suppliers. Together this ITQ, the Review and Refine Requirements (RRR) phase and the subsequent bid solicitation are the three parts of the solicitation process. No contract will result from this ITQ.

The pre-qualified suppliers will be referred to as the Qualified Respondents in this solicitation process. Only the Qualified Respondents will be permitted to bid on the subsequent bid solicitation. Below are the intended phases of the solicitation process. Each phase is briefly described in the attached Annex A.

Solicitation Process	
ITQ	Qualification Phase
Review and Refine Requirements (RRR)	Only Qualified Respondents will have an opportunity to enhance their understanding of the DCCS requirements
Bid solicitation (RFP)	Only Qualified Respondents can submit a bid

Given that this ITQ or the subsequent bid solicitation may be cancelled by Canada at any time in accordance with the applicable terms, it may not result in the subsequent procurement process described in this document. Because the ITQ is not a request for a proposal, suppliers who submit a response can choose not to bid on the subsequent bid solicitation.

This ITQ will address security functionality issues based on commercial solutions proposed to address the DCCS requirement. Accordingly, through this ITQ, Canada will assess the IT Supply Chain Security Information Form that is proposed to be part of DCCS that will interconnect with Canada's infrastructure in order to identify solutions that may potentially pose vulnerability or functionality threat to Canada. This is an issue of security and therefore evolving in nature and over time. The assessment of proposed solutions, however, will be applied uniformly based on the perceived threats at the time of closure of the ITQ.

The ITQ is divided into the following parts:

- Part 1 **General Information:** provides a general description of the requirement;
- Part 2 **Respondent Instructions:** provides the instructions, clauses and conditions applicable to the ITQ;
- Part 3 **Response Preparation Instructions:** provides suppliers with instructions on how to prepare their response;
- Part 4 **Evaluation Procedures and Basis of Qualification:** indicates how the responses will be evaluated and the basis of qualification;



Part 5 **Certifications**: includes the certifications to be provided.

## 1.2 Overview of the Requirement

Shared Services Canada (SSC) has the mandate to oversee the centralization of Government of Canada (GC) data centres and to provide overall enterprise-wide service delivery management for its 43 partner organizations. The goal is to optimize the delivery of GC data centre services by standardizing technologies, consolidating buildings and IT, centralizing operations, and re-engineering service delivery. This will reduce costs, improve service and security, and ensure the sustainability of GC data centre services.

As part of its mandate to consolidate the GC's data centres, SSC plans to pursue a multi-year Data Centre Co-Location Services (DCCS) contract for the provision of private sector data centre capacity. This capacity will augment existing and future projects to deliver the end state configuration for SSC data centres.

The specific requirement, as detailed in the attached draft RFP, is to acquire up to 2 Mega Watts of existing, highly available, commercial data centre co-location services to be delivered from one location within a range of not less than 10 kilometres in straight line distance and not more than 100 kilometres of fibre network distance, as measured from Angus Ontario (Latitude, Longitude: (44.313872, -79.8842912).

By utilizing this model, the Government of Canada will begin to benefit from its commitments in positioning SSC towards making use of an end-state data centre ready to accept high density, highly virtualized production workloads. The DCCS facility is intended to be paired with another primary site. The pairing of data centres will allow for high availability failover of business critical programs.

It is intended that the contract resulting from any subsequent bid solicitation will be used by SSC to provide shared services to its clients, which include SSC itself, those government institutions for whom SSC's services are mandatory at any point during the Contract Period, and those other organizations for whom SSC's services are optional at any point during the Contract Period and that choose to use those services from time to time. This solicitation process does not preclude SSC from using another method of supply for these or other entities of the Government of Canada with the same or similar needs.

Canada has invoked the National Security Exception in respect of this requirement and, as a result, none of the trade agreements apply to this requirement.



## PART 2 RESPONDENT INSTRUCTIONS

### 2.1 Standard Instructions, Clauses and Conditions

2.1.1 All instructions, clauses and conditions identified in the ITQ by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1.2 Respondents who submit a response agree to be bound by the instructions, clauses and conditions of the ITQ.

2.1.3 The 2003 (2013-06-01) Standard Instructions - Goods or Services - Competitive Requirements are incorporated by reference into and form part of the ITQ, except that:

- a) Wherever the term “bid solicitation” is used, substitute “Invitation to Qualify”;
- b) Wherever the term “bid” is used, substitute “response”;
- c) Wherever the term “Bidder(s)” is used, substitute “Respondent(s)”;
- d) Subsection 5(4), which discusses a validity period, does not apply, given that this ITQ invites suppliers simply to qualify.
- e) Section 3 of the Standard Instructions – Goods and Services – Competitive Requirements 2003 is amended as follows: delete “Pursuant to the *Department of Public Works and Government Services Act*, S.C. 1996, c.16”
- f) Subsections 4 and 5 of section 1 are deleted.
- g) Section 7 is replaced by the following:

- 1) A response delivered to the specified address after the closing date and time but before all responses have been assessed may be considered, provided the Respondent can prove the delay is due solely to a delay in delivery that can be attributed to the Delivery Company. Delivery Company means an incorporated courier company, Canada Post Corporation, or a national equivalent of a foreign country. The only pieces of evidence relating to a delay that are acceptable are:

- i) a cancellation date stamp; or
- ii) a courier bill of lading; or
- iii) a date stamped label

that clearly indicates that the response was received by the Delivery Company before the closing date.

- 2) Postage meter imprints, whether imprinted by the Respondent or the Delivery Company are not acceptable as proof of timely mailing.

h) Section 10 of the 2003 (2012-11-19) Standard Instructions – Goods and Services – Competitive Requirements is amended by:

1. changing the title to read “Legal Capacity and Ownership and Control Information”;
2. numbering the first paragraph as number 1.; and
3. adding the following paragraphs to the section:

2. The Bidder must provide, if requested by the Contracting Authority, the following information as well as any other requested information related to the ownership and control of the Bidder, its owners, its management and any related corporations and partnerships:

- (a) An organization chart for the Bidder showing all related corporations and partnerships;



- (b) A list of all the Bidder's shareholders and/or partners, as applicable; if the Bidder is a subsidiary, this information must be provided for each parent corporation or partnership, up to the ultimate owner; and
- (c) A list of all the Bidder's directors and officers, together with each individual's home address, date of birth, birthplace and citizenship(s); if the Bidder is a subsidiary, this information must be provided for each parent corporation or partnership, up to the ultimate owner.

In the case of a joint venture Bidder, this information must be provided for each member of the joint venture. The Contracting Authority may also require that this information be provided in respect of any subcontractors specified in a bid.

3. For the purposes of this section, a corporation or partnership will be considered related to another party if:

- (i) they are "related persons" or "affiliated persons" according to the *Canada Income Tax Act*;
- (ii) the entities have now or in the two years before the closing date had a fiduciary relationship with one another (either as a result of an agency arrangement or any other form of fiduciary relationship); or
- (iii) the entities otherwise do not deal with one another at arm's length, or each of them does not deal at arm's length with the same third party.

Section 12 of the 2003 (2012-11-19) Standard Instructions – Goods and Services – Competitive Requirements is amended by adding the following subsection 4:

4. Canada also reserves the right to reject a bid where Canada is of the opinion that awarding the contract to the Bidder could be injurious to the national interest or to national security.

- i) For the purposes of this ITQ, the PWGSC policies referenced within the Standard Instructions are adopted as SSC policies.

If there is a conflict between the provisions of 2003 and this document, this document prevails. All references to PWGSC contained within the Standard Instructions will be interpreted as a reference to SSC.

## 2.2 Submission of Responses

- a) Responses must be submitted to Shared Services Canada by the date, time and address indicated on page 1 of the ITQ.
- b) Due to the nature of the ITQ, responses delivered by hand or transmitted by facsimile to Shared Services Canada will not be accepted. Therefore, submissions must be mailed or couriered.
- c) Suppliers are requested to send an e-mail notification to [Consultationspc.sscconsultation@ssc-spc.gc.ca](mailto:Consultationspc.sscconsultation@ssc-spc.gc.ca) prior to the closing date indicating their intention to submit a response.

## 2.3 Enquiries and Comments

- a) All enquiries and comments, including suggestions to improve the specifications, regarding the ITQ and the draft bid solicitation must be submitted in writing to the Contracting Authority no later than 7 calendar days before the ITQ closing date. Enquiries received after that time may not be answered.
- b) Respondents should reference as accurately as possible the section and numbered item of the solicitation process to which the enquiry relates. Care should be taken by respondents to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a "proprietary" nature must be clearly marked



“proprietary” at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Respondent do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all respondents. Enquiries not submitted in a form that can be distributed to all respondents may not be answered by Canada.

- c) The draft RFP is attached herein in advance for the Qualified Respondents to provide written feedback during the next procurement RRR phase. Specific enquiries on the draft RFP may not be answered as further enhancement to the overall requirement may be conducted during the RRR phase only with the qualified respondents.

## **2.4 Composition of Core Team**

Each respondent submitting a Response to the ITQ must indicate the relevant company/organization names that comprise its Core Team in the ITQ Submission Form (Form 1).

The Core Team can be comprised of a maximum of 1 ITQ Response Lead and up to 2 additional core team members.

Once a Respondent has identified itself as the ITQ Response Lead, it must remain the ITQ Response Lead and cannot switch roles with any member of its team for the duration of the procurement process. This is because the contract will be awarded to the ITQ Response Lead. The ITQ Response Lead will be responsible for all contract deliverables. The other team members are there to support the ITQ Response Lead.



## PART 3 RESPONSE PREPARATION INSTRUCTIONS

### 3.1 Response Preparation Instructions

**3.1.1 Copies of Response:** Canada requests that Respondents provide their response in separately bound sections as follows:

- a) Section I: Qualification Response (3 hard copies) and 3 soft copies on DVD
- b) Section II: Certifications (2 hard copies)
- c) If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.
- d) Pricing is not a requirement and should not be included in the response.

**3.1.2 Format for Response:** Canada requests that Respondents follow the format instructions described below in the preparation of their response:

- a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- b) use a numbering system that corresponds to the ITQ;
- c) include a title page at the front of each volume of the response that includes the title, date, procurement process number, Respondent's name and address and contact information of its representative; and
- d) include a table of contents.

**3.1.3 Canada's Policy on Green Procurement:** In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process. See the Policy on Green Procurement (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Respondents should:

- a) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing a minimum of 30% recycled content; and
- b) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, and using staples or clips instead of cerlox, duotangs or binders.

### 3.1.4 Language for Future Communications

Respondents are requested to identify, in the Submission Form, which of Canada's two official languages the Respondent requests for future communications from Canada regarding this ITQ and all subsequent phases of the solicitation process.

### 3.1.5 Applicable Laws

Any resulting contract(s) which may result from the subsequent bid solicitation will be interpreted and governed and the relations between the parties determined, by the laws in force in Ontario.

A respondent may, at its discretion, substitute the above stated applicable laws to a Canadian province or territory of their choice without affecting the validity of its response, by indicating the name of the Canadian province or territory of its choice in the Submission Form. If no change is made, the Respondent acknowledges that the applicable laws specified above are acceptable to the Respondent.

### 3.1.6 Submission of Only One Response from a Responding Group:

- a) The submission of more than one response from members of the same responding group is not permitted in response to this ITQ. If members of a responding group participate in more than one response, Canada will provide the members of the responding group with 2 working





days to identify one response to be considered in this ITQ. Failure to meet this deadline will result in all responses being declared non-responsive and disqualified.

- b) For the purposes of this article, "responding group" means all entities (whether those entities include one or more natural persons, corporations, partnerships, limited liability partnerships, etc.) that are related to one another. Regardless of the jurisdiction where any of the entities concerned is incorporated or otherwise formed as a matter of law, entities are considered "related" for the purposes of this ITQ if:
- i) they are the same legal entity (i.e., the same natural person, corporation, partnership, limited liability partnership, etc.);
  - ii) they are "related persons" or "affiliated persons" according to the *Canada Income Tax Act*;
  - iii) the entities have now or in the two years before the ITQ closing had a fiduciary relationship with one another (either as a result of an agency arrangement or any other form of fiduciary relationship); or
  - iv) the entities otherwise do not deal with one another at arm's length, or each of them does not deal at arm's length with the same third party.

### 3.2 Section I: Qualification Response

3.2.1 A complete qualification response consists of the following:

- a) **Submission Form (Requested at ITQ Closing):** Respondents are requested to include the Submission Form with their responses. It provides a common form in which Respondents can provide information required for evaluation, such as a contact name, the Respondent's Procurement Business Number, the language for future communications etc. Using the form to provide this information is not mandatory, but it is recommended. If Canada determines that the information requested by the Submission Form is incomplete or requires correction, Canada will provide the Respondent with an opportunity to do so.

- b) **Mandatory Qualification Submission Requirements (Mandatory at ITQ Closing):**

Respondents must submit, with their Response on the ITQ closing date, the following:

**Supply Chain Security Information (mandatory at ITQ closing):**

- i) **IT Product List:** an IT Product List in accordance with Annex C.
- ii) **Network Diagrams:** One or more conceptual network diagrams that collectively show the complete network proposed to be used to deliver the services, including all mechanical and electrical components, as described in the draft Statement of Requirement. The network diagrams must include, at a minimum, physical and logical network topology, which must depict the nodes and connections among nodes in the network, and showing third party connections, if applicable. The network diagrams are only required to include portions of the Respondent's network (and its subcontractor's network(s)) over which Canada's data would be transmitted in performing any resulting contract.
  - (a) **List of Subcontractors:** The Respondent must provide a list of any subcontractors that could be used to perform any part of the Work (including subcontractors affiliated or otherwise related to the Respondent). The list must include at a minimum:
    - The name of the subcontractor;
    - The address of the subcontractor's headquarters;
    - The portion of the Work that would be performed by the subcontractor; and



- The location(s) where the subcontractor would perform the Work.

This list must identify all third parties who may perform any part of the Work, whether they would be subcontractors to the Respondent, or subcontractors to subcontractors of the Respondent down the chain. For the purposes of this requirement, a third party who is merely a supplier of goods to the Respondent, but who does not perform any portion of the Work, is not considered to be a subcontractor.

- c) **Technical Response:** In their technical response, respondents should demonstrate their understanding of the requirements contained in this ITQ and explain how they will meet these requirements. Respondents should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work. The technical response should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the response will be evaluated. Simply repeating the statement contained in the response is not sufficient. In order to facilitate the evaluation of the response, Canada requests that respondents address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, respondents may refer to different sections of their response by identifying the specific paragraph and page number where the subject topic has already been addressed.
- d) **Review and Refine Requirements (RRR) - Qualified Respondents participation and information forms (Required pre-RRR):** The Review and Refine Requirements (RRR) Process Document is provided in Annex G as a reference for the potential Qualified Respondents in advance of the RRR phase to expedite arrangements with Respondents resources for the RRR phase. Upon receiving the selection notice to participate in the RRR phase, Qualified Respondents will only be given 3 working days to submit signed Annex A – Agreement to Participate and Annex B – Information form of the RRR Process Document.

### 3.3 Section II: Certifications

See Part 5 regarding certification requirements.

## PART 4 EVALUATION PROCEDURES AND BASIS OF QUALIFICATION

### 4.1 Evaluation Procedures

- 4.1.1 Responses will be assessed in accordance with the entire requirement of the ITQ including the evaluation criteria.
- 4.1.2 An evaluation team composed of representatives of Canada will evaluate the responses. Canada may hire any independent consultant, or use any Government resources, to evaluate any response. Not all members of the evaluation team will necessarily participate in all aspects of the evaluation.
- 4.1.3 SSC has engaged Samson & Associates as a fairness monitor for this procurement. The fairness monitor will not be part of the evaluation team, but will observe the evaluation of the bids with respect to Canada's adherence to the evaluation process described in this bid solicitation.
- 4.1.4 In addition to any other time periods established in the ITQ:
- a) **Requests for Clarifications:** If Canada seeks clarification or verification from the Respondent about its response, including certifications, the Respondent will have 2 working days (or a longer period if specified in writing by the Contracting Authority) to provide the necessary information to Canada. Failure to meet this deadline will result in the response being declared non-responsive.



- b) **Extension of Time:** If additional time is required by the Respondent, the Contracting Authority may grant an extension in his or her sole discretion.

#### 4.2 Technical Evaluation - Mandatory Technical Criteria

4.2.1 Each response will be reviewed to determine whether it meets the mandatory requirements of the ITQ. Any element of the ITQ identified with the words “must” or “mandatory” is a mandatory requirement. Responses that do not comply with each and every mandatory requirement will be declared non-responsive and be disqualified.

Respondents are required to demonstrate compliance with all of the following Mandatory Technical Requirements. Respondents must submit Project References to SSC, as indicated in the section 4.2.2, and are required to provide the necessary documentation to support this compliance.

The Mandatory Technical Requirements listed below will be evaluated on a simple pass/fail (e.g. compliant / non-compliant) basis. Respondents that fail to meet any of the following Mandatory Technical Requirements will be not be considered Successful Respondents by Canada and will receive no further consideration following the completion of the ITQ Evaluation.

<b>Mandatory Location Requirement M01</b>
<p>The Respondent must provide an existing, single co-location service within a range of not less than 10 kilometres in straight line distance and not more than 100 kilometres of fibre network distance, as measured from Angus Ontario (Latitude, Longitude: (44.313872, -79.8842912)).</p> <p>The Respondent must provide:</p> <ul style="list-style-type: none"><li>(a) Proof supporting a distance separation of not less than 10 kilometres as evidenced through the use of cartography</li><li>(b) Proof supporting a distance separation of not more than 100 kilometres of fibre network distance as evidenced by a signed statement from one of the following telecommunications providers on their corporate letterhead: Bell, Telus, Allstream or Rogers.</li></ul>



### **Mandatory Experience Requirement M02**

The Respondent must demonstrate ownership or current operations of the proposed DCCS facility.

The Respondent must provide:

- (a) A signed copy of the title and deed from the provincial Land Registry Office OR substantiating document(s) that the Respondent is party to a written agreement with the owner of the facility and certifying that the Respondent currently has the right to, and does operate a data centre in the proposed existing facility , including provisions to extend the existing agreement..
- (b) The civic address of the proposed data centre.

The Respondent must reference the same data centre used in their response to M01.

### **Mandatory Tier III Equivalency of the Proposed Facility M03**

The Respondent must demonstrate that they meet the Tier III Equivalency of the Proposed Facility as detailed in Annex E. The Respondent must:

- (a) Check the compliance box for each element; and
- (b) Provide a description with supporting documentation that demonstrates how their facility is designed and constructed to be compliant with each specific requirement.

The Respondent must reference the same data centre used in their response to M01.



### Mandatory Experience Requirement M04

The Respondent must have a minimum of 5 years experience, in the successful management of an existing and operational data centre facility where co-location has been provided as a service for a minimum of 2 years. The data centre facility must have a size and scope equal to or greater than the specifications in Annex D Part 1– Data Centre Size and Scope Specification, and the data centre facility must have a co-location service that meets the requirements of Annex D Part 2 – Co-Location Requirements.

The Respondent must include a description of the location and specifications for the Respondent’s existing data centre facility where co-location is offered as a service. The description must address the requirements for size and scope in Annex D – Data Centre Specifications. The Respondent must include 2 co-location customer references which may be used to validate the Respondent’s successful co-location service management experience. The references must be from a client not affiliated with the Respondent. Each reference must support the required response to the following questions:

<ul style="list-style-type: none"> <li>a) Does your Service Level Agreement with the Respondent allow for planned outages to your IT processing while performing maintenance on the data centre mechanical and electrical subsystems?</li> <li>b) Do you have a current contract with the Respondent, for the provision of data centre co-location services, which has been in effect for a minimum of 2 years?</li> <li>c) Does your current IT equipment at a Respondent’s single location require a minimum of 50 KVA of UPS supplied power?</li> <li>d) Does your co-location service contract require facilities operation, 24 hours per day and 7 days per week?</li> <li>e) Have your availability (minimum 99%) service levels been met, on an annual basis, during the term of your existing contract?</li> <li>f) Does the Respondent use Security Guards to enforce positive identification and authentication of all personnel entering the facility?</li> <li>g) Does the Respondent secure your segregated client zone through use of physical barriers with controlled access points?</li> </ul>	<p>Must pass a) through g) to be compliant</p> <ul style="list-style-type: none"> <li>a) Yes response = Fail and No response =Pass</li> <li>b) Yes response = Pass and No response =Fail</li> <li>c) Yes response = Pass and No response =Fail</li> <li>d) Yes response = Pass and No response =Fail</li> <li>e) Yes response = Pass and No response =Fail</li> <li>f) Yes response = Pass and No response =Fail</li> <li>g) Yes response = Pass and No response =Fail</li> </ul>
---	---



#### 4.2.2 Client Organization Reference Check

##### i) ITQ Reference Project Form (mandatory at ITQ closing):

Respondents must demonstrate their previous experience by including fully completed versions of the ITQ Reference Project Form (Form 2) with their responses.

In the Respondent's Response to each requirement, where corporate experience is being evaluated, the Respondent may only specify its own corporate experience for evaluation, or where the Respondent is a joint venture, the corporate experience of one of the Joint venture partners.

Respondents are requested to indicate the page number(s) in their supporting project documentation that addresses a particular Mandatory Technical Experience Requirement.

As part of the reference verification process for the ITQ, Client Organizations may be contacted by email, to confirm that the information provided by Respondents in the Reference Project Form is true and accurate.

#### 4.2.3 Assessment of Supply Chain Security Information:

4.2.3.1 Canada will assess whether, in its opinion, the Supply Chain Security Information creates the possibility that the Respondent's solution could compromise or be used to compromise the security of Canada's equipment, firmware, software, systems or information.

4.2.3.2 In conducting its assessment:

- (a) Canada may request from the Respondent any additional information that Canada requires to conduct a complete security assessment of the Supply Chain Security Information. The Respondent will have 2 working days (or a longer period if specified in writing by the Contracting Authority) to provide the necessary information to Canada. Failure to meet this deadline will result in the response being disqualified.
- (b) Canada may use any government resources or consultants to conduct the assessment and may contact third parties to obtain further information. Canada may use any information, whether it is included in the response or comes from another source, that Canada considers advisable to conduct a comprehensive assessment of the Supply Chain Security Information.

4.2.3.3 If, in Canada's opinion, any aspect of the Supply Chain Security Information, if used in a solution, could compromise or be used to compromise the security of Canada's equipment, firmware, software, systems or information:

- (a) Canada will notify the Respondent in writing (sent by email) and identify which aspect(s) of the Supply Chain Security Information is subject to concern(s) or cannot be assessed (for example, proposed future releases of products cannot be assessed). Any further information that Canada might be able to provide to the Respondent regarding its concerns will be determined based on the nature of the concerns. In some situations, for reasons of national security, it may not be possible for Canada to provide further information to the Respondent; therefore, in some circumstances, the Respondent will not know the underlying reasons for Canada's concerns with respect to a product, subcontractor or other aspect of the Respondent's Supply Chain Security Information.



- (b) The notice will provide the Respondent with one opportunity to submit revised Supply Chain Security Information within the 10 calendar days following the day on which Canada's written notification is sent to the Respondent (or a longer period specified in writing by the Contracting Authority).
- (c) If the Respondent submits revised Supply Chain Security Information within the allotted time, Canada will perform a second assessment. If Canada determines that any aspect of the Respondent's revised Supply Chain Security Information could compromise or be used to compromise the security of Canada's equipment, firmware, software, systems or information, no further opportunities to revise the Supply Chain Security Information will be provided and the response will be disqualified.

4.2.3.4 By participating in this process, the Respondent acknowledges that the nature of information technology is such that new vulnerabilities, including security vulnerabilities, are constantly being identified. Also, the Respondent acknowledges that Canada's security assessment does not involve the assessment of a proposed solution. As a result:

- (a) qualification pursuant to this ITQ does not constitute an approval that the products or other information included as part of the Supply Chain Security Information will meet the requirements of the subsequent bid solicitation or any resulting contract or other instrument that may be awarded as a result of any subsequent bid solicitation;
- (b) qualification pursuant to this ITQ does not mean that the same or similar Supply Chain Security Information will be assessed in the same way for future requirements;
- (c) at any time during the subsequent bid solicitation process, Canada may advise a Respondent that some aspect(s) of its Supply Chain Security Information has become the subject of security concerns. At that point, Canada will notify the Respondent and provide the Respondent with an opportunity to revise its Supply Chain Security Information, using the same process described above.
- (d) during the performance of a subsequent contract, if Canada has concerns regarding certain products, designs or subcontractors originally included in the Supply Chain Security Information, the terms and conditions of that contract will govern the process for addressing those concerns.

**4.2.4** All Respondents will be notified in writing regarding whether or not they have qualified under this ITQ to proceed to the next stage of the procurement process.

**4.2.5** Any Respondent that has qualified under this ITQ will be required, when responding to any subsequent bid solicitation under this solicitation process, to propose a solution consistent with the final version of the Supply Chain Security Information it submitted with its response to this ITQ (subject to revision only pursuant to the paragraph below). Except pursuant to the paragraph below, no alternative or additional products or subcontractors may be proposed in the Respondent's solution. This is a mandatory requirement of this solicitation process.

**4.2.6** Once a Respondent has been qualified in response to this ITQ, no modifications are permitted to the Supply Chain Security Information except under exceptional circumstances, as determined by Canada. Given that not all the exceptional circumstances can be foreseen, whether changes may be made and the process governing those changes will be determined by Canada on a case-by-case basis.



#### 4.2.7 Security Clearance Requirement - mandatory at ITQ closing

Only those Respondents proposing its existing data centre co-location service within a range specified in M01 in section 4.2 of this document may request to be sponsored for the following security screening process.

Respondents and subcontractors that currently do not meet the security requirements as indicated in Part 7.6 – Resulting Contract Clauses described within the attached draft bid solicitation must initiate the security screening process immediately, as outlined below:

- a) Respondents (including any subcontractors, if applicable) that are not registered in the Industrial Security Program (ISP) of PWGSC's Canadian Industrial Security Directorate (CISD)<sup>1</sup> for DOS or FSC must ask to be registered in the ISP. Respondents must submit the request by e-mail to the Contracting Authority identified below. The request must include the following information:
  - (i) Solicitation Number for which the registration is requested;
  - (ii) Name of the Respondent;
  - (iii) Address of the Respondent's Office in Canada;
  - (iv) Telephone, fax numbers and e-mail address, as applicable;
  - (v) Name of President, CEO or contact, as applicable;
  - (vi) Language preference (English or French); and,
  - (vii) The Respondent's Procurement Business Number (PBN).

Hamid Mohammad  
Supply Team Leader  
Shared Services Canada  
180 Kent St., 13<sup>th</sup> floor, #K073  
Ottawa, Ontario K1P 0B6  
Canada

Email Address: [Consultationspc.sscconsultation@ssc-spc.gc.ca](mailto:Consultationspc.sscconsultation@ssc-spc.gc.ca)

Telephone: 613-716-9792

- b) Failure to comply with this request will render the response non-responsive.
- c) Canada will not delay its procurement in order to provide time for suppliers to obtain their registration for the required security clearances.

#### 4.3 Basis of Qualification

Respondent must comply with the requirements of the ITQ and meet all mandatory evaluation criteria to be declared a Qualified Respondent. Only Qualified Respondents will be invited to bid on the RFP. A Respondent whose response has been declared responsive is a Qualified Respondent for the next stage of the solicitation process. However, Canada reserves the right to re-evaluate the qualification of any Qualified Respondent at any time during the solicitation process.

---

<sup>1</sup> <http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>





## **PART 5 CERTIFICATIONS AND AGREEMENTS**

Respondents are requested to provide the certifications and documentation with their response. Respondents who do not provide some or all of the certifications, or where there appear to be errors in their certifications, will be given an opportunity after closing to submit or resubmit their certifications. The certifications provided by respondents to Canada are subject to verification by Canada at any time during this solicitation process. Canada will disqualify a response if any certification made by the Respondent is found to be untrue, whether made knowingly or unknowingly, during the ITQ evaluation period or during the subsequent bid solicitation.

The Contracting Authority will have the right to ask for additional information to verify the Respondent's certification at any time during this solicitation process. Failure to comply with this request will also render the response non-responsive or any bids submitted in subsequent phases will be declared non-responsive or will constitute a default under any resulting contract that may be issued during a subsequent phase of this solicitation process.

### **5.1 Code of Conduct and Certifications – Related documentation**

- a) By submitting a response, the Respondent certifies that the Respondent and its affiliates are in compliance with the provisions as stated in Sections 01 Code of Conduct and Certifications – Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.
- b) Respondents should provide, with their responses or promptly thereafter, a complete list of names of all individuals who are currently directors of the Respondent. If such a list has not been received by the time the evaluation of the responses is completed, the Contracting Authority will inform the Respondent of a time frame within which to provide the information. Respondents must submit the list of directors before the award of a contract award, failure to provide such a list within the required time frame will render the bid non-responsive.
- c) The Contracting Authority may, at any time, request that a Respondent provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form – PWGSC-TPSGC 229) for any or all individuals named in the aforementioned list within a specified delay. Failure to provide such Consent Forms within the delay will result in the response being declared non-responsive.

### **5.2 Non-Disclosure Agreement for Incorporation into ITQ**

By submitting a response, the Respondent agrees to the terms of the non-disclosure agreement below (the “Non-Disclosure Agreement”):

- a) The Respondent agrees to keep confidential any information it receives from Canada regarding Canada's assessment of the Respondent's Supply Chain Security Information (the “Sensitive Information”) including, but not limited to, which aspect of the Supply Chain Security Information is subject to concern, and the reasons for Canada's concerns.
- b) Sensitive Information includes, but is not limited to, any documents, instructions, guidelines, data, material, advice or any other information whether received orally, in printed form or otherwise and whether or not that information is labeled as classified, proprietary or sensitive.
- c) The Respondent agrees that it will not reproduce, copy, divulge, release or disclose, in whole or in part, in whatever way or form any Sensitive Information to any person other than a person employed by the Respondent who has a security clearance commensurate with the level of Sensitive Information being accessed, without the prior written consent of the Contracting Authority. The Respondent agrees to immediately notify the Contracting Authority if any person, other than those permitted by this Article, accesses the Sensitive Information at any time.



- d) All Sensitive Information will remain the property of Canada and must be returned to the Contracting Authority or destroyed, at the option of the Contracting Authority, if requested by the Contracting Authority, within 30 days following that request.
- e) The Respondent agrees that a breach of this Non-Disclosure Agreement may result in disqualification of the Respondent at either the ITQ or RFP stage, or immediate termination of the resulting Contract. The Respondent also acknowledges that a breach of this Non-Disclosure Agreement may result in a review of the Respondent's security clearance and review of the Respondent's status as an eligible respondent for other requirements.
- f) This Non-Disclosure Agreement remains in force indefinitely.



## FORM 1 - SUBMISSION FORM

<b>Respondent's full legal name</b> <i>[Note to Suppliers: Suppliers who are part of a responding group should take care to identify the correct corporation as the Respondent.]</i>	
<b>Authorized Representative of Respondent for evaluation purposes (e.g., clarifications)</b>	Name
	Title
	Address
	Telephone #
	Fax #
Email	
<b>Respondent's Procurement Business Number (PBN)</b> <i>[see the Standard Instructions 2003]</i> <b><i>[Note to Respondents: Please ensure that the PBN you provide matches the legal name under which you have submitted your response. If it does not, the Respondent will be determined based on the legal name provided, not based on the PBN, and the Respondent will be required to submit the PBN that matches the legal name of the Respondent.]</i></b>	
<b>Preferred language for future communications</b>	English _____  French _____
<b>Applicable Laws:</b> Respondent are requested to indicate the Canadian province or territory they wish to apply for applicable laws, as indicated in Part 3	
<b>Respondent's Proposed Site or Premises Requiring Safeguard Measures</b>	Address: Street Number / Street Name /, Unit / Suite / Apartment number City, Province, Territory / State Postal Code / Zip Code Country
<b>Security Clearance Level of Respondent</b> <i>[include both the level and the date it was granted]</i> <b><i>[Note to suppliers: Please ensure that the security clearance matches the legal name of the Respondent. If it does not, the security clearance is not valid for the Respondent.]</i></b>	
On behalf of the Respondent, by signing below, I confirm that I have read the entire ITQ including the documents incorporated by reference into the ITQ and I certify that: <ol style="list-style-type: none"> <li>1. The Respondent considers itself and its products able to meet all the mandatory requirements described in the ITQ; and</li> <li>2. All the information provided in the response is complete, true and accurate; and</li> <li>3. The Respondent agrees to be bound by the Non-Disclosure Agreement set out in Part 5 of this ITQ.</li> </ol>	
<b>Signature of Authorized Representative of Respondent</b>	



## Form 2: ITQ Reference Project Form

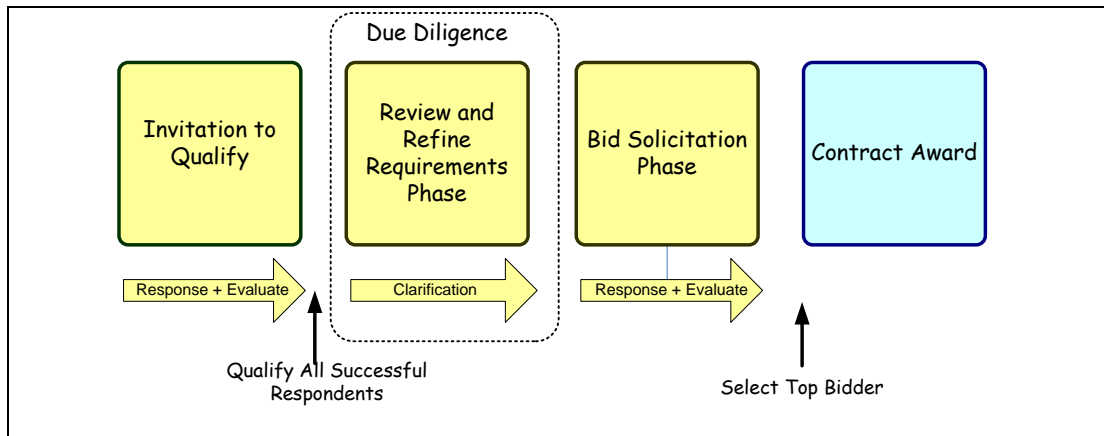
ITQ Reference Project Form	
<b>Respondent</b>	
<b>Name</b>	
<b>Address</b>	
<b>M04</b>	
<b>Reference Project 1 for M04</b>	
<b>Name of Client Organization</b>	
<b>Primary Client Organization Contact Name</b>	
<b>Primary Client Organization Contact Telephone</b>	
<b>Primary Client Organization Contact Email</b>	
<b>Backup Client Organization Contact Name</b>	
<b>Backup Client Organization Contact Telephone</b>	
<b>Backup Client Organization Contact Email</b>	
<b>Project Name</b>	
<b>Project Start Timeframe (dd-mm-yy)</b>	
<b>Project End Timeframe (dd-mm-yy or ongoing)</b>	
<b>Reference Project 2 for M04</b>	
<b>Name of Client Organization</b>	
<b>Primary Client Organization Contact Name</b>	
<b>Primary Client Organization Contact Telephone</b>	
<b>Primary Client Organization Contact Email</b>	
<b>Backup Client Organization Contact Name</b>	
<b>Backup Client Organization Contact Telephone</b>	
<b>Backup Client Organization Contact Email</b>	
<b>Project Name</b>	
<b>Project Start Timeframe (dd-mm-yy)</b>	
<b>Project End Timeframe (dd-mm-yy or ongoing)</b>	

## ANNEX A

### PROCUREMENT PROCESS

#### Overview

The DCCS multi-phase collaborative procurement solutions (CPS) process is shown in Figure 1 and summarized in Table 1. This process will be used until the final RFP(s) is issued to the Successful Respondents in the Bid Solicitation Phase. This approach will allow Canada to conduct due diligence of DCCS requirements with Successful Respondents before issuing bid solicitation(s).



Figure

1: DCCS Procurement Approach

Table 1: Summary of DCCS Procurement Phases

Procurement Phase	Objectives
Invitation to Qualify	<ul style="list-style-type: none"> <li>• Issue ITQ</li> <li>• Obtain ITQ responses from Respondents</li> <li>• Evaluate ITQ responses</li> <li>• Select the Qualified Respondents to continue to the Review and Refine Requirements Phase and Bid Solicitation Phase</li> </ul>
Review and Refine Requirements	<ul style="list-style-type: none"> <li>• Qualified Respondents have an opportunity to enhance their understanding of the DCCS requirements</li> </ul>
Bid Solicitation	<ul style="list-style-type: none"> <li>• Issue finalized RFP to all Qualified Respondents</li> <li>• Obtain bid responses from the Respondents</li> <li>• Evaluate the bid proposals</li> <li>• Select the successful proposal</li> </ul>
Contract Award	<ul style="list-style-type: none"> <li>• Award the DCCS contract to the winning Respondent</li> </ul>

Canada will not reimburse any Successful Respondent for expenses incurred during any of the DCCS ITQ Phase, Review and Refine Requirements Phase or Bid Solicitation Phase.



## Invitation to Qualify

The purpose of the Invitation to Qualify (ITQ) is to identify the Respondents who have demonstrated and proven necessary capabilities and experience in provisioning data centre co-location services.

The ITQ evaluation criteria focuses on the Respondent's capabilities and experience to deliver data centre co-location services, taking into consideration parameters for size, scope, and complexity. Please refer to Part 4 for the detailed evaluation criteria.

Respondents who meet all the mandatory criteria will be deemed Successful Respondents and will proceed to the "Review and Refine Requirements Phase", described below.

Once the Successful Respondents have been selected and have been notified that they have qualified for the next phase of the procurement process, Canada intends to proceed with the Review and Refine Requirements Phase. Successful Respondents may withdraw from the process by providing written notification to the Contracting Authority.

As part of ITQ, Canada has provided the Respondents with the RRR detailed process, see Annex G, that will be followed for the Review and Refine Requirements Phase.

## Review and Refine Requirements Phase

In this phase, Canada will engage Qualified Respondents in a collaborative review of its detailed requirements and request that the Qualified Respondents provide comments, suggestions, and/or identify areas that require additional clarification from Canada through the process as set out in the detailed materials provided to all Qualified Respondents. Canada will require a significant commitment from vendors during this phase, both in terms of time and resources. Canada will take into consideration the feedback provided by vendors and finalize its technical and solicitation requirements for use in the Bid Solicitation Phase. Canada may request input for topics, such as, but not limited to:

- a) Availability service levels;
- b) Liquidated damages;
- c) Power allocation models;
- d) Security
- e) Rack space provisioning models; and
- f) Cable plant.

It is the responsibility of each Qualified Respondent to take advantage of the Review and Refine Requirements Phase by asking the questions that are necessary to prepare a complete response(s) to the final bid solicitation(s).

The results of the Review and Refine Requirements Phase will be used by Canada to finalize the requirements for the RFP(s) in the Bid Solicitation Phase. They will not be used to evaluate Qualified Respondents.

## Documentation

During the Review and Refine Requirements Phase, in order to help the SSC understand Successful Respondents technology solutions, Canada may request specific documents including but not limited to:

- a) Physical security design specifications;
- b) Access control procedures;



- c) Racking standards; and
- d) Cabling standards.

**Bid Solicitation Phase**

In the Bid Solicitation Phase, Canada may issue a formal RFP to the Qualified Respondents who have participated in the Review and Refine Requirements Phase.

Each Qualified Respondent will be permitted to formally bid on the requirements set out in the RFP.

**Contract Award Phase**

Canada estimates the period of implementation of the DCCS to take up to 100 calendar days after contract award.

Canada is considering a 10-year contract(s) plus 3 five-year optional periods.

**Anticipated Schedule**

The anticipated schedule for the DCCS procurement phases, as well as Implementation, are shown in Table 2. The schedule is provided for information purposes, and will be used by Canada for planning purposes. It is subject to change by Canada.

**Table 2: Canada’s Anticipated Procurement and Implementation Schedule**

Phase	Estimated Duration
Invitation to Qualify	February 2014 to February 2014
Review and Refine Requirements	March 2014 to April 2014
Bid Solicitation(s)	April 2014 to May 2014
Contract Award	May 2014
Implementation and Initial Contract Period	June 2014 to August 2014



## **ANNEX C**

### **IT SUPPLY CHAIN SECURITY INFORMATION FORM**

(The IT Supply Chain Security Information Form is attached as PDF herein and as a separate fillable document in Excel)





---

## Annex D – Data Centre Specifications

### Part 1- Size and Scope Specifications:

The following represents the minimum data centre facility size and scope specifications for evaluation.

- a) Minimum of 1,000 KVA of UPS power;
- b) Minimum 10,000 square feet of data centre facility space dedicated to operational IT equipment;
- c) Concurrently maintainable mechanical and electrical subsystems, where no outage to client IT equipment is allowed during these maintenance activities;
- d) 24 hours per day, 7 days per week data centre operation;
- e) Minimum security and access controls as follows:
  - i) Video surveillance and alarm monitoring at all times for the areas including but not limited to all entrances to the property and data centre, entrances to the cage areas as applicable, loading docks and parking areas;
  - ii) Facility protection through use of multi-zone fire monitoring, detection and suppression systems;
  - iii) Access prohibited except through electronically controlled access points; and
  - iv) The use of security guards to enforce positive identification and authentication of all personnel entering the data centre.

### Part 2- Co-Location Requirements:

The following represents the minimum co-location requirements for evaluation.

- a) Co-location must be provided as a service as of the bid closing date;
- b) Physically segregated co-location clients through the use of cages or partition walls;
- c) Minimum 3 co-location clients, only 1 co-location client may be internal to the bidder's organization. Parent company, affiliates and subsidiaries are considered to be internal to the bidder;
- d) 99.98% availability or greater of the client co-location service on an annual basis;  
Total combined reserved power capacity sold to existing co-location clients is a minimum of 250KVA



## Annex E

### Tier III Equivalency of the Proposed Facility - Requirement Checklist

<b>Intent</b>
---------------

Shared Services Canada (SSC) has established that the Uptime Institute's (UTI) Tier III standard of data center performance is necessary to meet service level requirements. As such, SSC will make reference to the UTI Tier III standard (Annex J) throughout this document. Although references to the Tier III standard will be made, this is not to be interpreted as a requirement for official UTI certification in order to be found compliant. An official UTI certification (either design, construction or operational levels) is not a requirement.

The respondent's Data Centre Co-location Service (DCCS) must to have been designed and configured in a manner that is consistent with, and incorporates the UTI's Tier III performance requirements (as per UTI – "Data Centre Site Infrastructure Tier Standard: Topology" – 2012) or its equivalent, see Annex J. The UTI Tier III objectives herein do not inherently eliminate single points of failure. As such, the respondent must implement safe guards against any single points of failure in the mechanical and electrical systems.

Consistent with UTI Tier III, a suitable DCCS would feature complete concurrent maintainability of all elements of the critical infrastructure as well as incorporate redundant capacity components and independent distribution paths throughout the proposed facility for both power and cooling. As such, each and every critical infrastructure component at the site could be removed from service for maintenance activities while maintaining the full capacity of the DCCS and without ever interfering or requiring any shutdown of the client's active hosted services and business programs.

The key elements of the required DCCS performance objectives have been described in the UTI Tier III Equivalency Checklist included in this appendix. The purpose of the UTI Tier III Equivalency Checklist is to ensure that all respondents will be proposing a DCCS that will meet SSC's service level requirements and to ensure that all respondents propose a DCCS of similar and comparable quality.



## “UTI Tier III Equivalency Checklist” Terms and Definitions

**Requirement** - This column states the high level description of SSC’s requirement.

**Substantive Proof** - This column provides the respondent with a description of the required format of the information required for the SSC evaluation team to confirm that the requirements stated in the “Requirement” column are met. While the SSC recommendation for the format of the substantive proof has been stated, it will be the respondent's responsibility to provide all the necessary information beyond that listed in the substantive proof column if such is required to clearly demonstrate their compliance to the requirement.

**Compliance** – The Respondent’s answer in the “Compliance” column is intended to state the Respondents’ response to the requirements listed in the “Requirement” column. Please provide a “yes”, “no”, or “ex” (exception) in this column. The entry “ex” (exception) will indicate that the respondent provides “Substantive Proof” that demonstrates that they can meet the objective of the requirement by alternate means. Please note that if you reply “yes” or “ex” in this column you must provide the information described in the substantive proof column (or more) and include it with your response.

**Respondent Reference** - Please provide a clear reference to the location of the “Substantive Proof” provided in the Respondent’s response to this ITQ. Please provide either a page number or appendix reference so that the evaluation team can find the “Substantive Proof” provided.



**UTI Tier III Equivalency Checklist**

Item	Requirement	Substantive Proof	Compliance (yes/no/ex)	Respondent Reference
1	The proposed facility must have the ability to provide the capacity (power and cooling) requested as part of this ITQ. Please state the sites design capacity “N” (i.e. DCCS design capacity for IT loads at Tier III topology) and provide relevant and accurate system capacity data (based on the capacity rating design conditions consistent with UTI published methodology, as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 2.6) for all capacity elements in both electrical and mechanical distribution systems.	Provide a table listing all capacity elements along with their appropriate design capacity ratings. Please also state the ambient design conditions for the geographical location of the proposed facility		
2	The proposed facility must have a dedicated space for IT hardware (i.e. primary “computer room”), uninterruptible power supply (UPS) systems, dedicated cooling systems, and engine generators. (as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 2)	Provide floor plan layout with area square footage.		
3	The proposed facility must have redundant components for all capacity elements. Capacity elements are defined as engine generators, UPS systems, IT hardware cooling components including all related heat rejection equipment.( as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 2.3.1)	Provide high-level single line diagram(s) that clearly shows capacity for both electrical and mechanical capacity components.		
4	The proposed facility must meet the	Provide single line		



	requirements of concurrent maintainability for each and every electrical and mechanical capacity and distribution components and path (i.e. panel boards, feeders, transfer switches, pumps, heat transfer loop piping, isolation valves, pumps, fuel system, etc.). All maintenance at the facility must be capable of being performed without impact to the IT environment. (as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 2.3.2)	diagrams containing enough relevant detail to determine that the requirement is met. Additional documented process on how this is performed must be provided.		
5	The DCCS must meet all requirements of concurrent maintainability for all critical subsystems that would impact the continuous operation of the facility during maintenance procedures. This would include all related control systems (electrical and mechanical), emergency power off systems (if applicable), life safety or asset protection systems, and power sources for cooling equipment. (as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 3.4.3)	Provide single line diagrams containing enough relevant detail to determine if this requirement can be met. Additional documented process on how this is performed must be provided.		
6	The proposed facility must maintain a minimum of 12 hours of on-site fuel storage based on the stated site capacity “N”. (as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 2.3.1c)	Provide relevant engine generator fuel consumption data (at ambient design conditions) as well as on-site fuel storage capacity data.		
7	The proposed facility must provide on-site backup power (engine generators) that supports uninterrupted, continuous operation of the Co-location Service during all periods when power is unavailable from the utility company. The	Provide single line diagrams containing enough relevant detail to determine that this requirement is met. Additional		



	<p>engine-generator system must not have runtime limitations. Engine generator run time ratings must meet the UTI's Tier III rating requirements. (as per UTI – “Data Centre Site Infrastructure Tier Standard: Topology” – 2012 section 3.3). As well, the engine generator plant must meet the requirements of concurrent maintainability while carrying the critical load during periods when utility power is unavailable.</p>	<p>documentation on capacity and consumption must be provided.</p>		
8	<p>In addition to the requirements stated in this section, the facility must provide and configure the DCCS to include a concurrently maintainable dual active-active (A-B) conditioned electrical backbone configuration to all client racks and standalone IT equipment, regardless of circuit type and receptacle requirements.</p>	<p>Provide single line diagrams containing enough relevant detail to determine that this requirement is met. Additional documented process on how this is performed must be provided, such as electrical Standard Operational Procedures and supply chain agreements.</p>		
9	<p>The site will incorporate measures to minimize the time spent in “failover” mode or “maintenance” mode during either a component failure condition for scheduled maintenance condition at the facility. This time must be less than 12 hours.</p>	<p>Provide single line diagrams containing enough relevant detail to determine that this requirement is met, along with contract and documented procedures to support this.</p>		



## **Annex F**

### **Draft RFP**

**Note to Bidders:** Annex F, Draft RFP is provided as a separate document in PDF format.



## **Annex G**

### **Review and Refine Requirements Process Document**

**Note to Bidders:** Annex G, RRR Process Document is provided as attached.

*NOTE: Potential Qualified Respondents are reminded, Annex A of RRR Process Document– Agreement to Participate and Annex B of RRR Process Document – Information Form is due to the Contracting Authority no later than 3 business days upon receiving confirmation from the Contracting Authority of their successful selection in the participation in the RRR phase.*





## Annex H: Glossary of Terms

Acronym	Description
CPS	Collaborative Procurement Solutions
GC	Government of Canada
IM	Information Management
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITQ	Invitation to Qualify
ITSM	IT Service Management
MAN	Municipal Area Network
NATO	North Atlantic Treaty Organization
OGD	Other Government Department
PWGSC	Public Works and Government Services Canada
RFP	Request for Proposal
RRR	Review, Revise Requirement
SMS	Shared Municipal Area Network Service
SSC	Shared Services Canada
WAN	Wide Area Network



## Annex I: Definitions of Terms

Term	Definition
Affiliate	For the purposes of this solicitation, an Affiliate will include any entity which does not operate at arm's length from the Respondent, including a parent or a branch, division or subsidiary of the Respondent.
Bid	An offer to provide services or supply goods as a result of a solicitation.
Respondent	A person or entity (or, in the case of a joint venture, the persons or entities) submitting a bid to perform a contract for goods, services or both. It does not include the parent, subsidiaries or other affiliates of the Respondent, or its subcontractors.
Client Organization	An entity of users, from either a public or private sector organization, receiving services from an Email Solution operated by the ITQ Response Lead or Core Team Members 2 and/or 3.
Co-location	A service provisioned from a controlled and managed data centre space, including conditioned power, cooling, floor space and access. The service is typically shared by multiple customers that locate and administer their own network, server and storage gear and interconnect to a variety of telecommunications and other network service provider(s) with a minimum of cost and complexity.
Core Team	The Core Team can be comprised of a maximum of 1 ITQ Response Lead and up to 2 additional core team members.
Invitation to Qualify (ITQ).	Procurement instrument used to identify Qualified Respondents for the Review and Refine Requirements and Bid Solicitation phases of the CPS procurement approach.
Joint Venture	Association of two or more parties who combine their money, property, knowledge, expertise or other resources in a single joint business enterprise, sometimes referred as a consortium, to bid together on a requirement.
Project Reference	A reference of a project for a Client Organization that is being used by the Respondent for addressing the mandatory requirements in Form 2: ITQ Reference Project Form, whereby SSC reserves the right to check references with the Client Organization to verify information about the project.



Term	Definition
Protected Information	<p>This refers to specific provisions of the <i>Access to Information Act</i> and the <i>Privacy Act</i> and applies to sensitive personal, private, and business information.</p> <p>Protected A (low-sensitive): Applies to information that, if compromised, could reasonably be expected to cause injury outside the National Interest, for example, disclosure of exact salary figures.</p> <p>Protected B (particularly sensitive): applies to information that, if compromised, could reasonably be expected to cause serious injury outside the National Interest, for example, loss of reputation or competitive advantage.</p> <p>Protected C (extremely sensitive): applies to the very limited amount of information that, if compromised, could reasonably be expected to cause extremely grave injury outside the National Interest, for example, loss of life.</p>
Respondent	A supplier of data centre co-location services, who submits a Response to this ITQ, and who is accountable for ensuring that all of its deliverables, as required by the DCCS procurement process, are achieved. The Respondent can be a single firm, or a Joint Venture.
Response	The ITQ Response Submission Form, ITQ Reference Project Form, and Certification Form that the Respondent submits in satisfaction of this ITQ.
ITQ Response Lead	The Respondent of a Core Team.
Security Assessment	The on-going process of evaluating the performance of IT security controls throughout the lifecycle of information systems to establish the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the departmental business needs for security. Security assessment supports authorization by providing the grounds for confidence in information system security.
Qualified Respondent	A Respondent who is identified by Canada to participate in the Review and Refine Requirements and Bid Solicitation phases of the procurement.
Agreement	Means the Agreement to Participate to be entered into by the SSC with the Qualified Respondent for the Review and Refine Requirements phase, should the Respondent become a Qualified Respondent. A pro-forma Agreement is attached as Annex A to RRR Process Document.
Commercial Confidential Meeting (CCM)	Means a meeting between SSC and the Qualified Respondent in which aspects of the project, and potentially Qualified Respondent solutions are discussed in a commercially confidential setting that may involve the sharing of Confidential Qualified Respondent Information.



Term	Definition
Confidential Qualified Respondent Information	Means all Qualified Respondent information that is confidential by its nature or in the circumstances in which it is received, including all confidential information in the custody or control of SSC, regardless of whether it is identified as confidential or not, and whether recorded or not, and however fixed, stored, expressed or embodied, which comes into the knowledge, possession or control of SSC.
Fairness Monitor	Means an independent third party whose role is to observe the procurement process, to provide related feedback on fairness issues to SSC and to provide an unbiased and impartial opinion on the fairness of the observed procurement process.
Open Meeting	Means a meeting between SSC and all Qualified Respondents in which aspects of the Data Centre Co-location Services (DCCS) are discussed, excluding aspects that have been identified as Confidential Qualified Respondent Information.



## Annex J

### Uptime Institute Tier Standard Topology

**Note:** Annex J, Uptime Institute Tier Standard Topology follows.

Title: DATA CENTRE CO-LOCATION SERVICES(DCCS)  
for  
Shared Services Canada

ANNEX C: IT SUPPLY CHAIN SECURITY INFORMATION FORM

*ITQ no.: 10032992/A*

## ANNEX C: IT SUPPLY CHAIN SECURITY INFORMATION FORM

**ITQ no.:** \_\_\_\_\_

**Title:** \_\_\_\_\_

*Third party affiliates, partners, resellers, etc. will be identified as "subcontractors" in this text.*

### 1. IT Products List

1.1 Respondents must provide a complete list of all the Products that will be used in the IT infrastructure and services of the Respondent's proposed Solution (including, but not limited to, products used by the Respondent, its subcontractors and their subcontractors) using the IT Product List table of this attachment. If applicable to the Respondent's Solution, the list must include, but not limited to:

Control systems for UPSes;  
Generators;  
Power distribution units (PDUs);  
rack PDUs;  
Cooling systems;  
Access control (swipe access cards, biometrics);  
Monitoring (video, environmental);  
Main distribution frame (MDF);  
Intermediate distribution frame (IDF); and  
Structured cabling.

1.2 Respondents should indicate the Respondent's name, the page number and the total number of pages of the list on each page.

1.3 Respondents must use a separate table for each subcontractor, partner or reseller.

1.4 Respondents must insert a separate table row for each Product.

Respondents must adhere to the following guidelines to fill in the columns of the table for each Product:

- a) Product Type
  - i) A common product type generally recognized by Industry such as: appliance, server, software, etc.
- b) Product Name
  - i) The name brand of the product manufactured or software published by a company.
- c) Product Model and Version Number
  - i) Product model as advertised by the Product Manufacturer.
  - ii) Version of the product as established by the Product Manufacturer or Software Publisher.
  - iii) Firmware version as indicated by the Product Manufacturer (if applicable).
- d) Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components
  - i) Product Manufacturer: assembles component parts to manufacture a Product.
  - ii) Software Publisher: the owner of the copyright of the software, who has the right to license (and authorize others to license/sub-license) its software products.
  - iii) Original Equipment Manufacturer (OEM): manufactures components that are embedded by the Product Manufacturer in the Product.
  - iv) Respondents must provide the name of the Product Manufacturer of the Product and a complete list of all the components, whether used or not, along with their Original Equipment Manufacturer name.
- e) Country of Origin of Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components
  - i) Indicate in what country is the headquarters of the Product Manufacturer or Software Publisher.
  - ii) For each embedded component identified for the Product in column (d), the respondent must indicate in what country is the headquarters of the OEM and must provide a list of the countries where the OEM develops and produces any portion of the component including software and hardware. Respondents must clearly indicate what activities are taking place in each country.
- f) Open Source Code
  - i) Identify any open source components that are in the Product, whether enabled or not (open-source software is computer software with its source code made available and licensed with a license in which the copyright holder provides the rights to study, change and distribute the software to anyone and for any purpose).
- g) Third Party Components
  - i) Identify any other applications, features or components that are in the Product whether enabled or not (third party hardware refers to components that are developed by companies besides the original computer manufacturer and third party software refers to programs that are developed by companies other than the company that developed the computer's operating system).

1.5 See the example in the "Example-IT Products List" Table.

## ANNEX C: IT SUPPLY CHAIN SECURITY INFORMATION FORM

### 2. Subcontractors List

- 2.1 Respondents must provide a complete list of all the Subcontractors that will be used in the Respondent's Solution using the Subcontractors List table of this attachment. This includes any services involved in the operations of the IT infrastructure of the Respondent's proposed solution, including both software and hardware that are provided by a third party affiliate, partner or subcontractor of the Respondent and their own third party affiliates, partners or subcontractors, etc.
- 2.2 Respondents should indicate the Respondent's name, the page number and the total number of pages of the list on each page.
- 2.3 Respondents must insert a separate table row for each Subcontractor.
- Respondents must adhere to the following guidelines to fill in the columns of the table for each Subcontractor.
- a) Company Name
    - i) Name of Company proposed to provide the service.
  - b) Country
    - i) Country where proposed service will be performed.
  - c) Subcontractor Functions
    - i) General description of the intended usage or role in the Respondent's solution.

### 3. Network Diagram (if applicable)

- 3.1 Respondents must include in their IT Supply Chain Security Information Form a high level Network Diagram of the IT infrastructure that will be used in the Respondent's Solution.
- 3.2 The network diagrams must include, at a minimum, the physical and logical network topology, which must depict the nodes and connections among nodes in the network and show third party connections, if applicable. The network diagrams are only required to include portions of the Respondent's network (and its subcontractors' network(s)) over which Canada's data would be transmitted in performing any resulting contract.
- 3.3 If required, details of the nodes in the network, including protocols, bandwidths, IP addressing schema, router rules, Firewall rules, IP Tables and default gateway may be requested at any time during the assessment.



### ANNEX C: IT PRODUCTS LIST TABLE EXAMPLE

ITQ No.: \_\_\_\_\_

Respondent's Legal Name: Our Company Inc

Subcontractor's Legal Name (if applicable): Their Company Inc

Product Type (a)	Product Name (b)	Product Model and Version Number (c)	Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (d)	Country of Origin of Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (e)	Open Source Code (f)	Third Party Components (g)
Server	Advance Firewall ACME	Product Model X.X Firmware version Y.Y.Y	Company X HQ in USA. Software y developed in USA,Poland & India. Hardware z developed in USA & Taiwan	Company X HQ in USA Software Y created in USA. Hardware (component a) manufactured in Mexico	List components that are open source: X, Y and Z.	List components or provide list of components: e.g. Matrox G200e Video with 16 mb Memory integrated into the IMM2. See attached list.
<div style="font-size: 48px; opacity: 0.5; font-weight: normal;">EXAMPLE</div>						

**ANNEX C: IT PRODUCTS LIST TABLE EXAMPLE**

**ITQ No.:** \_\_\_\_\_

**Respondent's Legal Name:** Our Company Inc

**Subcontractor's Legal Name (if applicable):** Their Company Inc

Product Type (a)	Product Name (b)	Product Model and Version Number (c)	Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (d)	Country of Origin of Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (e)	Open Source Code (f)	Third Party Components (g)

**EXAMPLE**

**ANNEX C: IT PRODUCTS LIST TABLE**

**ITQ No.:** \_\_\_\_\_

**Respondent's Legal Name:**

**Subcontractor's Legal Name (if applicable):**

Product Type (a)	Product Name (b)	Product Model and Version Number (c)	Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (d)	Country of Origin of Product Manufacturer, Software Publisher and Original Equipment Manufacturer of embedded components (e)	Open Source Code (f)	Third Party Components (g)

**ANNEX C: SUBCONTRACTORS LIST TABLE EXAMPLE**

**ITQ No.:** \_\_\_\_\_

**Respondent's Legal Name:** Our Company Inc

Company Name ( a )	Country ( b )	Subcontractor Functions ( c )
ACME IT Services Ltd.	United States	Monitor and respond to network alerts outside normal business hours
	<p><b>EXAMPLE</b></p>	

### ANNEX C: SUBCONTRACTORS LIST TABLE EXAMPLE

**ITQ No.:** \_\_\_\_\_

**Respondent's Legal Name:** Our Company Inc

Company Name ( a )	Country ( b )	Subcontractor Functions ( c )

### ANNEX C: SUBCONTRACTORS LIST TABLE

ITQ No.: \_\_\_\_\_

Respondent's Legal Name:

Company Name ( a )	Country ( b )	Subcontractor Functions ( c )

### ANNEX C: SUBCONTRACTORS LIST TABLE

**ITQ No.:** \_\_\_\_\_

**Respondent's Legal Name:**

Company Name ( a )	Country ( b )	Subcontractor Functions ( c )

**Shared Services Canada**

**Data Centre Co-location Services (DCCS)**

**ANNEX G**

**Review and Refine Requirements Process Document**



# Table of Contents

<b>1</b>	<b>GENERAL INFORMATION .....</b>	<b>1</b>
1.1	SCOPE OF THE GUIDANCE DOCUMENT .....	1
1.2	CONTENT .....	1
<b>2</b>	<b>REVIEW AND REFINE REQUIREMENTS PROCESS .....</b>	<b>1</b>
2.1	OVERVIEW .....	1
2.2	SHARED SERVICES CANADA OBJECTIVES .....	1
2.3	APPROACH .....	2
2.4	QUALIFIED RESPONDENT OBLIGATIONS .....	3
2.5	KEY COLLABORATION ACTIVITIES .....	4
2.6	TOPICS FOR COLLABORATION ACTIVITIES .....	4
2.7	ANTICIPATED SCHEDULE .....	5
<b>3</b>	<b>ANNEX RRR - A – AGREEMENT TO PARTICIPATE .....</b>	<b>6</b>
<b>4</b>	<b>ANNEX RRR- B - INFORMATION FORM.....</b>	<b>9</b>

## **1 General Information**

### **1.1 Scope of the Guidance Document**

This document defines the process of formal interactions between SSC and Qualified Respondents during the Review and Refine Requirements Phase including:

- Commercial Confidential Meetings (CCMs) for flexible, open and confidential discussion between the Qualified Respondent and Shared Services Canada (SSC);
- Open Meetings for open discussions between all Qualified Respondents and SSC; and
- Written responses to documents and questions provided by SSC.

### **1.2 Content**

This document includes the following:

- Definitions of Terms;
- Description of the procurement process and the Review and Refine Requirements phase (RRR);
- Qualified Respondent obligations prior to and during the RRR; and
- The Agreement to be signed by the Respondents prior to commencement of the RRR.

## **2 Review and Refine Requirements Process**

### **2.1 Overview**

In this phase, Canada will provide Qualified Respondents with its draft detailed requirements and request that Qualified Respondents provide comments, suggestions, and/or identify areas that require additional clarification from Canada. Canada will require a significant commitment from Qualified Respondents during this phase, both in terms of time and resources. Canada will take into consideration the feedback provided by Qualified Respondents and finalize its technical and solicitation requirements for use in the Bid Solicitation Phase.

It is the responsibility of each Qualified Respondent to take advantage of the Review and Refine Requirements Phase by asking the questions that are necessary to prepare a complete response to the final bid solicitation.

The results of the Review and Refine Requirements Phase will be used by Canada to finalize the requirements for the RFP in the Bid Solicitation Phase. They will not be used to evaluate Qualified Respondents/Bidders.

### **2.2 Shared Services Canada Objectives**

- Understand key cost drivers
- Develop solution strategies for inclusion in the RFP
- Review and refine the requirements

## 2.3 Approach

- There will be a Kick-Off Open Meeting for all Qualified Respondents at the start of the RRR Phase.
- There will be at least 3 work topics of RRR activities, each with their own schedule and topics to be addressed. Although SSC will try to coordinate activities to minimize any overlap, due to time constraints, some parts of the topics schedules may run in parallel. Some of the topics are:
  - Availability service levels and associated liquidated damages;
  - Co-location provisioning models; and
  - Security.
- Each topic will have its own collaboration approach. These may incorporate some or all of the following:
  - Open Meetings (for open and collaborative discussions between all Qualified Respondents and SSC)
  - Commercial Confidential Meetings (one-on-ones for flexible, open and confidential discussion between Qualified Respondent and SSC)
  - Written Responses
- No videoconferencing will be made available during this phase. Teleconferencing may be available for some non-secret Commercial Confidential Meetings.
- All meetings and events will be located either in the National Capital Region (NCR) or Toronto. Teleconference capability will be available as appropriate.
- Meetings and events are scheduled by SSC and may not be rescheduled in order to accommodate Qualified Respondent availability. If a Qualified Respondent or individual is unable to attend a meeting or event, all documentation provided will be shared with the Qualified Respondent. SSC may not hold a separate meeting or event for Qualified Respondents or individuals unable to attend the scheduled meeting or event.
- Additional meetings or events may be scheduled. SSC will provide Qualified Respondents with a minimum of 2 business days' notice for any additional meetings or events.
- If SSC provides additional generic information to a Qualified Respondent during a Commercial Confidential Meeting, that information will also be made available to all other Qualified Respondents.
- SSC recognizes that each Qualified Respondent may require clarifications or materials that are specific to their solution and approach.
- All requirements provided by SSC during the RRR phase are to be deemed draft requirements only and are subject to change. The final requirements will be available at the Bid Solicitation phase.
- All communications outside of a fixed meeting or event will be directed to the Contracting Authority identified hereunder.

Hamid Mohammad  
Consultationspc.sscconsultation@ssc-spc.gc.ca  
819-956-0510

- The Fairness Monitor may be present at each meeting and event to ensure equitable treatment of all Qualified Respondents.
- SSC will conduct the RRR in a fair, open and transparent manner while respecting the commercially confidential materials of the Qualified Respondents.

## 2.4 Qualified Respondent Obligations

- Respondents must identify a Project Lead and one backup for the Review and Refine Requirements Phase. The Project Lead will be responsible for all communications with SSC outside of fixed meetings. The form at Annex B can be used to provide this information.
- Only Qualified Respondent Project Leads are permitted to communicate with the Contracting Authority, who will then disseminate the information to the appropriate parties within SSC. When providing the information to Qualified Respondents, the Contracting Authority will only provide the information to the Qualified Respondent Project Leads, who will be responsible for disseminating the information to the appropriate parties within their team.
- Respondents upon receiving confirmation of their successful selection to participate in the RRR phase must then provide in 3 business days, the name and contact information for the Project Lead, backup, as well as all personnel participating in the Review and Refine Requirements Phase (personnel who will be attending Open Meetings, Commercial Confidential Meetings. The form at Annex B can be used to provide this information.
- Respondents upon receiving confirmation of their successful selection to participate in the RRR phase must return in 3 business days the attached, non-negotiable Agreement to Participate in Annex A, signed by the Respondent's representative. Qualified Respondents will not be able to start participating in the RRR until such time as they have returned the signed Agreement to Participate. If a signed Agreement to Participate is returned after the RRR has started, SSC will provide the Qualified Respondent with all documentation provided to Qualified Respondents since the beginning of the RRR, but may not re-open discussion topics or hold additional meetings with the Qualified Respondent.
- If the Qualified Respondent wishes to replace or add personnel who will be participating in the RRR phase, they must notify the Contracting Authority and provide the required security information with a minimum of one-week's notice.
- Any statement made by any of SSC's representatives during meetings will not constitute a representation of a fact, is not in any way binding on SSC and cannot be deemed nor is it to be considered to be an indication of a preference or rejection by SSC of anything presented during the meeting. The entire requirement for the DCCS will be solely that which will be set out in the final RFP document.
- All materials released to Qualified Respondents will be considered "Draft" documents and are subject to change at SSC's discretion.
- Qualified Respondents shall not seek to obtain commitments from any of SSC's representatives during meetings or otherwise seek to obtain an unfair competitive advantage over any other Qualified Respondent.
- Each Qualified Respondent is solely responsible, at its own cost and expense, to carry out its own independent research, due diligence or to perform any other investigations, including seeking independent advice, considered necessary by the Qualified Respondent. Canada will not reimburse any Qualified Respondent for expenses incurred during the RRR Phase.
- Where applicable, Qualified Respondents are responsible for identifying any materials and documents they release as Commercial Confidential.

## 2.5 Key Collaboration Activities

- Collaborative Workshops
  - Will be used to validate requirements and evolve the DCCS strategy
  - Information may be distributed to all Qualified Respondents before workshops
  - It is anticipated that day one will be an open meeting with a questions and answers session and day two will be CCMs. Where time permits, CCMs may begin on the first Collaborative Workshop day.
  - Qualified Respondents will be required to register for the CCMs no later than the day before the Collaborative Workshop. When requesting a CCM, Project Leads are to email the Contracting Authority and identify the preferred date, time and duration for the CCM.
  - Qualified Respondents can submit written feedback on a subject from a Collaborative Workshop at any time.
- Written Submissions
  - For SSC to request additional information or feedback on an SSC position or decision point. The Contracting Authority will distribute these requests to the Project Leads.
- Open Discussion Forums
  - There may be online discussion forums available for SSC to present requirements, architecture and contracting-related decisions that SSC is facing and to encourage Qualified Respondents to use on-line collaboration techniques to exchange opinions/perspectives (example: forums). All information posted will be visible by all Qualified Respondents.
- Ad-hoc meetings and events
  - SSC may call an ad-hoc Open Meeting, CCM, or any other event. The Contracting Authority will advise the Project Leads with a minimum of 2 business days' notice.
  - A Qualified Respondent can request an ad-hoc Open Meeting, CCM, or any other event. The Project Lead must send a written request to the Contracting Authority detailing the request, the reason for the request as well as the suggested date, time and duration.
- Qualified Respondent Project Summary Presentations
  - Qualified Respondents will be provided with the opportunity to present their approaches to delivering DCCS, to demonstrate a capability, to provide final feedback on requirements, and to outline approaches to resolve any key outstanding issues. Qualified Respondents will set their own agenda.

## 2.6 Topics for Collaboration Activities

1. Availability service levels and associated liquidated damages;
  - a. Continuous availability
  - b. Penalties for lack of service
2. Co-location provisioning
  - a. Fit-up and timelines
  - b. Reserved power

- c. Power allocation
  - d. Cabling
  - e. Racking
3. Security
- a. Security Requirements
  - b. Security Certification
  - c. Security Operations

## **2.7 Anticipated Schedule**

Below is a preliminary summary schedule for the Review and Refine Requirements Phase that will take place three weeks after ITQ close

Week 1 – Kick-off meeting, Collaborative Workshops CCMs, topics 1, 2 and 3 and Respondents written feedback to the draft RFP published in advance with the ITQ

Week 2 – Collaborative Workshops CCMs, topics 1, 2, 3 and Vendor Showcase

Week 3 - Draft RFP Q and A

### 3 Annex RRR - A – Agreement to Participate

**Respondent Name:** \_\_\_\_\_

Agreement to Participate in the Review and Refine Requirements Phase for the Shared Services Canada (SSC) Data Centre Co-location Services (DCCS)

#### **Agreement to Participate**

The undersigned Respondent hereby agrees to participate in the RRR process as provided in the document entitled “Review and Refine Requirements Process Document”. In so agreeing to participate, the Respondent hereby acknowledges and agrees:

1. That the undersigned Respondent acknowledges and understands that it is not permitted to participate in the RRR process unless it has signed this Agreement to Participate.
2. That in agreeing to participate in the RRR process, the Respondent:
  - a. Agrees to be bound by the process through which the RRR will be conducted between SSC and Respondents participating in the RRR.
  - b. Agrees that any and all costs to participate will be borne by the Respondent where such costs may include but are not limited to people, logistics, demonstration products, demonstration platforms, and travel expense costs.
  - c. Agrees that to the following regarding personnel security clearances:
    - i. No security clearance is required for personnel attending unclassified meetings or events.
    - ii. No security clearance is required for personnel accessing unclassified SSC documents or materials.
  - d. Agrees to hold confidential any and all materials provided by SSC as being Confidential SSC Information. Similarly, SSC agrees to hold confidential any and all materials provided by the Respondent and identified as being Confidential Qualified Respondent Information. Specifically, the following Agreement to Participate Non-Disclosure terms apply:
    - i. That, it will not reproduce, copy, use, divulge, release or disclose, in whole or in part, in whatever way or form any Confidential SSC Information described above to any person other than its officers, directors, employees, agents and subcontractors who have a need-to-know for purposes of the project and undertakes to safeguard the same and take all necessary and appropriate measures, including those set out in any written or oral instructions issued by Canada, to prevent the disclosure of or access to such information in contravention of this agreement.
    - ii. Without limiting the foregoing, in the event that the Respondent uses any subcontractors, the Respondent shall enter into a confidentiality agreement with such subcontractors consistent with the terms and conditions of this Agreement. Notwithstanding the foregoing, the Respondent acknowledges that it shall remain liable for any acts or omissions of its officers, directors, employees, agents and subcontractors and any breach by them of their obligations hereunder.

- iii. SSC is subject to the *Access to Information Act* and *Privacy Act*, with respect to, and protection of, information under its custody and control. Accordingly, all documents provided to SSC by the Respondent pursuant to this Agreement to Participate may be available to the public unless the party submitting the information requests that it be treated as confidential.

---

## Acknowledgement

---

The undersigned Respondent hereby acknowledges and agrees:

1. That, any statement or commentary made by any of SSC's representatives, managers, employees, consultants, advisors and/or agents during meetings:
  - a. will not constitute a representation of any kind, whether a representation of fact or otherwise;
  - b. will not in any way amend or waive any provision of this agreement;
  - c. is not in any way binding on SSC nor on any of its representatives, managers, employees, consultants, advisors and/or agents;
  - d. cannot be deemed or considered to be an indication of a preference or rejection by SSC of anything presented during the meeting; and
  - e. SSC shall be under no obligation to confirm, in writing or otherwise, any information exchanged during the meeting.
2. That the undersigned shall not seek to obtain commitments from any of SSC's representatives, managers, employees, consultants, advisors and/or agents during meetings nor seek to obtain an unfair competitive advantage over any other Respondent.
3. That the undersigned shall not attempt to use any aspect of meetings to obtain information that is not equally available to other Respondents should they request such information.
4. That SSC is not obligated to and will not disclose the content of a Commercial Confidential discussion with any other Respondent save where such content uncovered during a Commercial Confidential discussion may materially impact the project as a whole. SSC will discuss with the Respondent prior to disclosing any Confidential Qualified Respondent Information.
5. That all meetings may be attended by the Fairness Monitor
6. That the entire requirement for the DCCS is solely that which will appear in the RFP.

## Acceptance

The Respondent agrees to flow-down the obligations of this agreement to its employees, partner's employees and any other entity participating in the RRR process as part of the Respondent's team.

The Respondent understands that any concerns with respect to the fairness of the RRR process should be brought to the attention of the Contracting Authority.

The Agreement to Participate and incorporated Acknowledgement shall apply to all elements of the RRR process.



**IN WITNESS WHEREOF** the Respondent has executed this Agreement to Participate and incorporated Acknowledgement, Waiver and Release effective as of the day and year first above written.

---

(Print) Name of Qualified Respondent:

---

Qualified Respondent Representative Signature:

---

(Print) Name of Qualified Respondent Representative:

---

(Print) Qualified Respondent Representative Job Title:

---

Witnessed By:

---

(Print) Name of Witness:

---

#### 4 Annex RRR- B - Information Form

The information requested in this form is due to the Contracting Authority no later than 3 business days upon receiving confirmation of their successful participation in the RRR phase.

**Respondent Company Name:** \_\_\_\_\_

	<b>First Name</b>	<b>Last Name</b>	<b>Email</b>	<b>Telephone</b>
<b>Project Lead</b>				
<b>Project Lead Backup</b>				
<b>RRR Participants (other than the above). Insert as many rows as required</b>				

**UPTIME INSTITUTE, LLC**

# **Data Center Site Infrastructure Tier Standard: Topology**

**Prepared by Uptime Institute Professional Services, LLC**

Copyright ©2009-2012 by Uptime Institute, LLC

20 West 37th Street - 6th Floor  
New York, NY 10018

All rights reserved.

The Uptime Institute's (Institute) Publications are protected by international copyright law. The Institute requires written requests at each and every occasion that the Institute's intellectual property or portions of the Institute's intellectual property are reproduced or used. The Institute copyright extends to all media—paper, electronic, and video content—and includes use in other publications, internal company distribution, company Web sites and marketing materials, and handouts for seminars and courses. For more information, please visit [www.uptimeinstitute.com/resources](http://www.uptimeinstitute.com/resources) to download a Copyright Reprint Permission Request Form.

**Abstract:** The Institute *Tier Standard: Topology* is an objective basis for comparing the functionality, capacity, and expected availability (or performance) of a particular site infrastructure design topology against other sites, or for comparing a group of sites. This Standard describes criteria to differentiate four classifications of site infrastructure topology based on increasing levels of redundant capacity components and distribution paths. This Standard focuses on the definitions of the four Tiers and the performance confirmation tests for determining compliance to the definitions. The Commentary, in a separate section, provides practical examples of site infrastructure system designs and configurations that fulfill the Tier definitions as a means to clarify the Tier classification criteria.

**Keywords:** ambient temperatures, autonomous response, availability, classification, Compartmentalization, Concurrent Maintenance, Concurrently Maintainable, Continuous Cooling, data center, dry bulb, dual power, Fault Tolerance, Fault Tolerant, functionality, infrastructure, metrics, Operational Sustainability, performance, redundant, reliability, Tier, Tier level, Tiers, topology, wet bulb

## Introduction

This introduction is not part of the Institute *Data Center Site Infrastructure Tier Standard: Topology*. It provides the reader with context for the application of the Standard.

This Institute *Data Center Site Infrastructure Tier Standard: Topology* is a restatement of the content previously published as the Institute publication *Tier Classifications Define Site Infrastructure Performance*. Selected content of this publication has been reedited into an ANSI Standards Model format. Future updates or changes to the Institute *Tier Standard: Topology* shall be accomplished through a review and recommendation process consistent with other recognized Standards bodies.

The Tier Classifications were created to consistently describe the site-level infrastructure required to sustain data center operations, not the characteristics of individual systems or subsystems. Data centers are dependent upon the successful and integrated operation of electrical, mechanical, and building systems. Every subsystem and system must be consistently deployed with the same site uptime objective to satisfy the distinctive Tier requirements. The most critical decision-making perspective owners and designers must consider, when making inevitable tradeoffs, is what effect does the decision have on the life-cycle-integrated operation of the Information Technology (IT) environment in the computer room.

Simply put, the Tier topology rating for an entire site is constrained by the rating of the weakest subsystem that will impact site operation. For example, a site with a robust Tier IV UPS configuration combined with a Tier II chilled water system yields a Tier II site rating.

This very stringent definition is driven by senior executives who have approved multi-million dollar investments for an objective report of actual site capabilities. Any exceptions and exclusions footnoted in the approval documents will be quickly lost and forgotten. If a site has been advertised within an organization as being Fault Tolerant (Tier IV), it will be inconsistent to have to plan a site shutdown at any time in the future—regardless of any “fine print” exclusions that diligently identified the risk. For this reason, there are no partial or fractional Tier ratings. A site's Tier rating is not the average of the ratings for the critical site infrastructure subsystems. The site's Tier rating is the lowest of the individual subsystem ratings.

Similarly, the Tier rating cannot be claimed by using calculated mean time between failures (MTBF) component statistical reliability to generate a predictive availability and then using that number to match the empirical availability results with those of sites representing the different Tier classifications. Statistically valid component values are not available, partly because product life cycles are getting shorter and no independent, industry-wide database exists to collect failure data.

Finally, this Standard focuses on the topology and performance of an individual site. High levels of end-user availability may be attained through the integration of complex IT architectures and network configurations that take advantage of synchronous applications running on multiple sites. However, this Standard is independent of the IT systems operating within the site.

## Copyrights

This document is copyrighted by the Uptime Institute, LLC. The Institute—in making this document available as a reference to governmental agencies, public institutions, and private users—does not waive any rights in copyright to this document.

## Participants

The original contents of the *Data Center Site Infrastructure Tier Standard: Topology* were developed by the following individuals:

W. Pitt Turner, IV

John H. Seader

Vincent E. Renaud

With editorial contribution by:

Julian S. Kudritzki

Kenneth G. Brill

**Contents**

1. Overview	1
1.1. Scope	1
1.2. Purpose	1
1.3. References	1
1.4. Related Publications	1
2. Tier Classification Definitions	1
2.1. Tier I – Basic Data Center Site Infrastructure	1
2.2. Tier II – Redundant Site Infrastructure Capacity Components	2
2.3. Tier III – Concurrently Maintainable Site Infrastructure	2
2.4. Tier IV – Fault Tolerant Site Infrastructure	3
2.5. Engine-Generator Systems	3
2.6. Ambient Temperature Design Points	4
2.7. Communications Routing	4
2.8. Makeup Water	4
2.9. Tier Requirements Summary	4
3. Commentary for Application of the Tier Standard: Topology	5
3.1. Outcome-Based Tier Standard	5
3.2. Impact of Ambient Design Conditions	5
3.3. Restrictions Against Engine-Generator Runtime Limitations (Tier III and Tier IV)	5
3.4. Tier Functionality Progression	6
3.5. Fractional or Incremental Tier Classification	6
3.6. Non-Compliance Trends	7
Modifications	7

## 1. Overview

### 1.1 Scope

This Standard establishes four distinctive definitions of data center site infrastructure Tier classifications (Tier I, Tier II, Tier III, Tier IV), and the performance confirmation tests for determining compliance to the definitions. The Tier classifications describe the site-level infrastructure topology required to sustain data center operations, not the characteristics of individual systems or subsystems. This Standard is predicated on the fact that data centers are dependent upon the successful and integrated operation of several separate site infrastructure subsystems, the number of which is dependent upon the individual technologies (e.g., power generation, refrigeration, uninterruptible power sources, etc.) selected to sustain the operation.

Every subsystem and system integrated into the data center site infrastructure must be consistently deployed with the same site uptime objective to satisfy the distinctive Tier requirements.

Compliance with the requirements of each Tier is measured by outcome-based confirmation tests and operational impacts. This method of measurement differs from a prescriptive design approach or a checklist of required equipment.

Commentary on this Standard is in a separate section that provides examples for the design and configuration of facility systems for each Tier topology level. The commentary section also offers guidance in the application and implementation of the Tier definitions. In addition, the commentary section includes discussion and examples to aid in understanding Tier concepts as well as information on common design topology shortfalls.

### 1.2 Purpose

The purpose of this Standard is to equip design professionals, data center operators, and non-technical managers with an objective and effective means for identifying the anticipated performance of different data center site infrastructure design topologies.

### 1.3 References

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, *ASHRAE Handbook – Fundamentals* (Latest Version).

Institute *Fault Tolerant Power Compliance Specification, Version 2.0*.

### 1.4 Related Publications

*Accredited Tier Designer Technical Paper Series*

Further information can be found at [www.uptimeinstitute.com/resources](http://www.uptimeinstitute.com/resources).

## 2. Site Infrastructure Tier Standards

### 2.1 Tier I: Basic Site Infrastructure

#### 2.1.1 The fundamental requirement:

- a) A Tier I basic data center has non-redundant capacity components and a single, non-redundant distribution path serving the critical environment. Tier I infrastructure includes: a dedicated space for IT Systems; a UPS to filter power spikes, sags, and momentary outages; dedicated cooling equipment; and an engine generator to protect IT functions from extended power outages.
- b) Twelve hours of on-site fuel storage for engine generator(s).

#### 2.1.2 The performance confirmation tests:

- a) There is sufficient capacity to meet the needs of the site.
- b) Planned work will require most or all of the site infrastructure systems to be shut down affecting critical environment, systems, and end users.

#### 2.1.3 The operational impacts:

- a) The site is susceptible to disruption from both planned and unplanned activities. Operation (Human) errors of site infrastructure components will cause a data center disruption.
- b) An unplanned outage or failure of any capacity system, capacity component, or distribution element will impact the critical environment.

- c) The site infrastructure must be completely shut down on an annual basis to safely perform necessary preventive maintenance and repair work. Urgent situations may require more frequent shutdowns. Failure to regularly perform maintenance significantly increases the risk of unplanned disruption as well as the severity of the consequential failure.

## 2.2 Tier II: Redundant Site Infrastructure Capacity Components

### 2.2.1 The fundamental requirement:

- a) A Tier II data center has redundant capacity components and a single, non-redundant distribution path serving the critical environment. The redundant components are extra engine generators, UPS modules and energy storage, chillers, heat rejection equipment, pumps, cooling units, and fuel tanks.
- b) Twelve hours of on-site fuel storage for 'N' capacity.

### 2.2.2 The performance confirmation tests:

- a) Redundant capacity components can be removed from service on a planned basis without causing any of the critical environment to be shut down.
- b) Removing distribution paths from service for maintenance or other activity requires shutdown of critical environment.
- c) There is sufficient permanently installed capacity to meet the needs of the site when redundant components are removed from service for any reason.

### 2.2.3 The operational impacts:

- a) The site is susceptible to disruption from both planned activities and unplanned events. Operation (Human) errors of site infrastructure components may cause a data center disruption.
- b) An unplanned capacity component failure may impact the critical environment. An unplanned outage or failure of any capacity system or distribution element will impact the critical environment.
- c) The site infrastructure must be completely shut down on an annual basis to safely perform preventive maintenance and repair work. Urgent situations may require more frequent shutdowns. Failure to regularly perform maintenance significantly increases the risk of unplanned disruption as well as the severity of the consequential failure.

## 2.3 Tier III: Concurrently Maintainable Site Infrastructure

### 2.3.1 The fundamental requirements:

- a) A Concurrently Maintainable data center has redundant capacity components and multiple independent distribution paths serving the critical environment. Only one distribution path is required to serve the critical environment at any time.
- b) All IT equipment is dual powered as defined by the Institute's *Fault Tolerant Power Compliance Specification, Version 2.0* and installed properly to be compatible with the topology of the site's architecture. Transfer devices, such as point-of-use switches, must be incorporated for critical environment that does not meet this specification.
- c) Twelve hours of on-site fuel storage for 'N' capacity.

### 2.3.2 The performance confirmation tests:

- a) **Each and every** capacity component and element in the distribution paths can be removed from service on a planned basis without impacting any of the critical environment.
- b) There is sufficient permanently installed capacity to meet the needs of the site when redundant components are removed from service for any reason.

### 2.3.3 The operational impacts:

- a) The site is susceptible to disruption from unplanned activities. Operation errors of site infrastructure components may cause a computer disruption.
- b) An unplanned outage or failure of any capacity system will impact the critical environment.
- c) An unplanned outage or failure of a capacity component or distribution element may impact the critical environment.



- d) Planned site infrastructure maintenance can be performed by using the redundant capacity components and distribution paths to safely work on the remaining equipment.
- e) During maintenance activities, the risk of disruption may be elevated. (This maintenance condition does not defeat the Tier rating achieved in normal operations.)

## 2.4 Tier IV: Fault Tolerant Site Infrastructure

### 2.4.1 The fundamental requirements:

- a) A Fault Tolerant data center has multiple, independent, physically isolated systems that provide redundant capacity components and multiple, independent, diverse, active distribution paths simultaneously serving the critical environment. The redundant capacity components and diverse distribution paths shall be configured such that 'N' capacity is providing power and cooling to the critical environment after any infrastructure failure.
- b) All IT equipment is dual powered as defined by the Institute's *Fault Tolerant Power Compliance Specification, Version 2.0* and installed properly to be compatible with the topology of the site's architecture. Transfer devices, such as point-of-use switches, must be incorporated for critical environment that does not meet this specification.
- c) Complementary systems and distribution paths must be physically isolated from one another (compartmentalized) to prevent any single event from simultaneously impacting both systems or distribution paths.
- d) Continuous Cooling is required.
- e) Twelve hours of on-site fuel storage for 'N' capacity.

### 2.4.2 The performance confirmation tests:

- a) A single failure of any capacity system, capacity component, or distribution element will not impact the critical environment.
- b) The infrastructure controls system demonstrates autonomous response to a failure while sustaining the critical environment.
- c) **Each and every** capacity component and element in the distribution paths can be removed from service on a planned basis without impacting any of the critical environment.
- d) There is sufficient capacity to meet the needs of the site when redundant components or distribution paths are removed from service for any reason.

### 2.4.3 The operational impacts:

- a) The site is not susceptible to disruption from a single unplanned event.
- b) The site is not susceptible to disruption from any planned work activities.
- c) The site infrastructure maintenance can be performed by using the redundant capacity components and distribution paths to safely work on the remaining equipment.
- d) During maintenance activity where redundant capacity components or a distribution path shut down, the critical environment is exposed to an increased risk of disruption in the event a failure occurs on the remaining path. This maintenance configuration does not defeat the Tier rating achieved in normal operations.
- e) Operation of the fire alarm, fire suppression, or the emergency power off (EPO) feature may cause a data center disruption.

## 2.5 Engine-Generator Systems

Engine-generator systems are considered the primary power source for the data center. The local power utility is an economic alternative. Disruptions to the utility power are not considered a failure, but rather an expected operational condition for which the site must be prepared. Accordingly, engine generators must automatically start and assume load upon loss of utility.

### 2.5.1 Site on Engine-Generator Power

A Tier III or IV engine-generator system, along with its power paths and other supporting elements, shall meet the Concurrently Maintainable and/or Fault Tolerant performance confirmation tests while they are carrying the site on engine-generator power.

### 2.5.2 Manufactures' Runtime Limitation

Engine generators for Tier III and IV sites shall not have a limitation on consecutive hours of operation when loaded to 'N' demand. Engine generators that have a limit on consecutive hours of operation at 'N' demand are appropriate for Tier I or II.

### 2.5.3 Regulatory Runtime Limitation

Engine-generator systems often have an annual regulatory limit on operating hours driven by emissions. These environmental limits do not impact the consecutive hours of operation constraint established in this section.

## 2.6 Ambient Temperature Design Points

The effective capacity for data center facilities infrastructure equipment shall be determined at the peak demand condition based on the climatological region and steady state operating set points for the data center. All manufactures' equipment capacities shall be adjusted to reflect the extreme observed temperatures and altitude at which the equipment will operate to support the data center.

### 2.6.1 Extreme Annual Design Conditions

The capacity of all equipment that rejects heat to the atmosphere shall be determined at the Extreme Annual Design Conditions that best represents the data center location in the most recent edition of the *ASHRAE Handbook – Fundamentals*. (Each ASHRAE Handbook is revised and published every 4 years.) The design Wet Bulb (WB) temperature shall be the listed Extreme Max WB value and the design Dry Bulb (DB) temperature for design shall be the "N=20 years" value.

### 2.6.2 Computer Room Set points

The capacity for computer room cooling equipment shall be determined at the return air temperature, and relative humidity established by the owner for steady state data center operations.

## 2.7 Communications Routing

Conveyance for fiber or communications connections from off site to data center communication demarcation must be in accordance with Concurrently Maintainable requirements for Tier III and Fault Tolerant, Compartmentalized requirements for Tier IV.

## 2.8 Makeup Water

On-site, backup makeup water storage is required for Tier III and Tier IV sites using evaporative cooling. Accordingly, the makeup water system must also be Concurrently Maintainable and Fault Tolerant as required to the point of delivery for a minimum duration of 12 hours.

## 2.9 Tier Requirements Summary

A summary of the preceding requirements defining the four distinct Tier classification levels is in Table 1.

Table 1: Tier Requirements Summary

	Tier I	Tier II	Tier III	Tier IV
Active Capacity Components to Support the IT Load	N	N+1	N+1	N After any Failure
Distribution Paths	1	1	1 Active and 1 Alternate	2 Simultaneously Active
Concurrently Maintainable	No	No	Yes	Yes
Fault Tolerance	No	No	No	Yes
Compartmentalization	No	No	No	Yes
Continuous Cooling	No	No	No	Yes

### 3. **Commentary for Application of the Tier Standard: Topology**

*This Commentary is not part of the Data Center Site Infrastructure Tier Standard: Topology. It provides the reader with context for the application of the Standard.*

#### 3.1 **Outcome-Based Tier Standard**

The definitions used in the Institute's Tier Standard are necessarily and intentionally very broad to allow innovation and client manufacture and equipment preferences in achieving the desired level of site infrastructure performance or uptime. The individual Tiers represent categories of site infrastructure topology that address increasingly sophisticated operating concepts, leading to increased site infrastructure availability.

The operational performance outcomes that define the four Tiers of site infrastructure are very straightforward. Many designs that pass a checklist approach will fail an operational performance requirements approach. This means that, in addition to the rigorous application of engineering principles, there is still considerable judgment and flexibility in the design for uptime and how subsystems are integrated to allow for multiple operating modes.

#### 3.2 **Impact of Ambient Design Conditions**

The sustainable effective capacity of most cooling and power generating equipment is impacted by the actual ambient conditions in which it operates. These components typically require more energy to operate and provide less usable capacity as altitude and ambient air temperatures rise.

A common practice for conventional facilities is to select design values applicable to most but not all anticipated hours of operation of that facility. This results in an economical choice of equipment that meets requirements most of the time. This is not appropriate for data centers that are expected to operate on a 24 x Forever basis.

Using a DB temperature for design that is exceeded 2% of the time results in selection of a component that is undersized 175 hours of the year. Although this may seem to imply that the owner runs an operational risk for a little over one week each year, these hours actually occur incrementally spread over several days. The 2% design value could result in actual conditions exceeding the design parameters of the equipment several hours every afternoon for a 1- to 2-month period. A 0.4% value, considered conservative by many design professionals, still results in equipment performing below requirements approximately 35 hours each year.

Another example concerning ambient conditions arises when selecting heat rejection systems for split system direct expansion cooling system. Many manufactures provide product selection tables based on 95°F/35°C ambient outside conditions. These components will only produce the nominal capacity listed when operating in up to 95°F/35°C outside air. These component capacities must be adjusted downward to provide the required capacity when temperatures exceed 95°F/35°C.

#### 3.3 **Restrictions Against Engine-Generator Runtime Limitation (Tier III and Tier IV)**

The intent of the restriction against engine-generator runtime limitation is to ensure the engine-generator plant is capable of supporting the site load on a continuous basis. Tier topology requires that the load capacity of engine generators bearing one of the three main ISO 8528-1 ratings (Continuous, Prime, Standby) must be considered differently, based on the specific rating.

a) **Continuous**-rated engine generators can be run for an unlimited number of hours at the rated kW.

b) **Prime**-rated engine generators can be run for a limited number of hours at the rated kW. This capacity does not meet the intent of Section 2.5. As stated in ISO 8528-1, the capacity of a Prime-rated engine generator must be reduced to 70% (derated) to operate on an unlimited basis. Some manufactures state a different reduced capacity (may be more or less than 70%) at which the engine generator can operate on an unlimited basis either in the product specification, or by separate letter. The manufactures' certification of capacity at an unlimited duration will be used to determine compliance with Tier requirements.

c) **Standby** engine generators are, by definition, held to an annual run-hour limitation. This limitation does not meet the intent of Section 2.5. Some manufactures state a different, reduced capacity at which the engine generator can operate on an unlimited basis either in the product specification, or by separate letter. The manufactures' certification of capacity at an unlimited duration will be used to determine compliance with Tier requirements.

### 3.4 Tier Functionality Progression

Owners who select Tier I and Tier II solutions to support current IT technology are typically seeking a solution to short-term requirements. Both Tier I and Tier II are usually tactical solutions, i.e., driven by first-cost and time-to-market more than life-cycle cost and uptime (or availability) requirements. Rigorous uptime requirements and long-term viability usually lead to the strategic solutions found more often in Tier III and Tier IV site infrastructure. Tier III and Tier IV site infrastructure solutions have an effective life beyond the current IT requirement. Strategic site infrastructure solutions enable the owner to make strategic business decisions concerning growth and technology, unconstrained by current site infrastructure topology.

#### 3.4.1 Tier I

Tier I solutions acknowledge the owner's desire for dedicated site infrastructure to support IT systems. Tier I infrastructure provides an improved environment over that of an ordinary office setting and includes: a dedicated space for IT systems; a UPS to filter power spikes, sags, and momentary outages; dedicated cooling equipment not shut down at the end of normal office hours; and an engine generator to protect IT functions from extended power outages.

#### 3.4.2 Tier II

Tier II solutions include redundant critical power and cooling capacity components to provide an increased margin of safety against IT process disruptions due to site infrastructure equipment failures. The redundant components are typically extra UPS modules, chillers, heat rejection equipment, pumps, cooling units, and engine generators. A malfunction or normal maintenance will result in loss of a capacity component.

#### 3.4.3 Tier III

Tier III site infrastructure adds the concept of Concurrent Maintenance beyond what is available in Tier I and Tier II solutions. Concurrent Maintenance means that **each and every** capacity or distribution component necessary to support the IT processing environment can be maintained on a planned basis without impact to the IT environment. The effect on the site infrastructure topology is that a redundant delivery path for power and cooling is added to the redundant critical components of Tier II. Maintenance allows the equipment and distribution paths to be returned to 'like-new' condition on a frequent and regular basis.

Thus, the system will reliably and predictably perform as originally intended. Moreover, the ability to concurrently allow site infrastructure maintenance and IT operation requires that **each and every** system or component that supports IT operations must be able to be taken offline for scheduled maintenance without impact to the IT environment. This concept extends to important subsystems such as control systems for the mechanical plant, start systems for engine generators, EPO controls, power sources for cooling equipment and pumps, isolation valves, and others.

#### 3.4.4 Tier IV

Tier IV site infrastructure builds on Tier III, adding the concept of Fault Tolerance to the site infrastructure topology. Similar to the application of Concurrent Maintenance concepts, Fault Tolerance extends to **each and every** system or component that supports IT operations. Tier IV considers that any one of these systems or components may fail or experience an unscheduled outage at any time. The Tier IV definition of Fault Tolerance is based on a single component or path failure.

However, the site must be designed and operated to tolerate the cumulative impact of every site infrastructure component, system, and distribution path disrupted by the failure. For example, the failure of a single switchboard will affect every subpanel and equipment component deriving power from the switchboard. A Tier IV facility will tolerate these cumulative impacts without affecting the operation of the computer room.

### 3.5 Fractional or Incremental Tier Classification

The four Tier Standard Classifications address topology, or configuration, of site infrastructure, rather than a prescriptive list of components to achieve a desired operational outcome. For example, the same number of chillers and UPS modules can be arranged on single power and cooling distribution paths resulting in a Tier II solution (Redundant Components), or on two distribution paths that may result in a Tier III solution (Concurrently Maintainable).

Consistent, across-the-board application of Tier topology concepts for electrical, mechanical, automation, and other subsystems is required for any site to satisfy the Tier standards defining any classification level. Selecting the appropriate topology solution based on the IT availability requirements to sustain well-defined business processes, and the substantial

financial consequences for downtime, provides the best foundation for investment in data center facilities. It is preferable for the owner's focus during the data center design and delivery process to be on the consistent application of the Tier Performance Standard rather than on the details that make up the data center site infrastructure

However, site infrastructure has been occasionally described by others in the industry in terms of fractional Tiers (e.g., Tier 2.5), or incremental Tiers (Tier III +, Enhanced Tier III, or Tier IV-lite). Fractional or incremental descriptions for site infrastructure are not appropriate and are misleading. Including a criteria or an attribute of a higher Tier Classification in the design does not increase the overall Tier Classification. However, deviation from the Tier objective in any subsystem will prevent a site from being Certified at that Tier.

- a) A site that has an extra (redundant) UPS module but needs all the installed cooling units running to keep the computer room temperature within limits does not meet the redundancy requirements for Tier II.
- b) A switchboard that cannot be shut down without affecting more than the redundant number of secondary chilled water pumps (reducing the available capacity to less than N) is not Concurrently Maintainable and will not be Certified as Tier III.
- c) Including a UPS system patterned after a Tier IV system within a site having a Tier II power distribution backbone yields a Tier II Certification.

### 3.6 Non-Compliance Trends

The most significant deviations from the Tier Standard found in most sites can be summarized as inconsistent solutions. Frequently, a site will have a robust, Fault Tolerant electrical system patterned after a Tier IV solution, but will utilize a Tier II mechanical system that cannot be maintained without interrupting computer room operations. This results in an overall Tier II site rating.

Most often, the mechanical system fails Concurrent Maintenance criteria because of inadequate coordination between the number and location of isolation valves in the chilled water distribution path. Another common oversight is branch circuiting of mechanical components, which results in having to shut down the entire mechanical system to perform electrical maintenance. If more than the redundant number of chillers, towers, or pumps is de-energized for electrical maintenance, computer-room cooling is impacted.

Electrical systems often fail to achieve Tier III or Tier IV criteria due to design choices made in the UPS and the critical power distribution path. UPS configurations that utilize common input and output switchgear are almost always unmaintainable without critical environment outages and will fail the Tier III requirements even after spending many hundreds of thousands of dollars. Topologies that include static transfer switches in the critical power path for single-corded IT devices will likely fail both the Fault Tolerance criteria and the Concurrent Maintenance criteria.

Consistent application of standards is necessary to have an integrated solution for a specific data center. It is clear that the IT organization invests heavily in the features offered by newer critical environment technology. Often, as the electrical and mechanical infrastructures are defined and the facility operations are established, there is a growing degree of inconsistency in the solutions incorporated in a site. An investment in one segment must be met with a similar investment in each of the other segments if any of the elements in the combined solution are to have the desired effect on IT availability. A well-executed data center master plan or strategy should consistently resolve the entire spectrum of IT and facility requirements.

### Modifications

This Standard incorporates the 2010 voting results of the Owners Advisory Committee. The engine-generator fuel storage requirements is effective 1 May 2010.

The changes incorporated are a result of the 2012 discussion and voting by the Owners Advisory Committee. All updates specific to this version are effective 1 August 2012.

## ABOUT THE UPTIME INSTITUTE

**Uptime Institute** is an unbiased, third-party data center research, education, and consulting organization focused on improving data center performance and efficiency through collaboration and innovation. The Uptime Institute serves all shareholders of the data center industry, including enterprise and third-party operators, manufacturers, providers, and engineers. This collaborative approach, complemented with the Uptime Institute's capability to recognize trends on a global basis and to interface directly with owners, results in solutions and innovations freed from regional constraints for the benefit of the worldwide data center industry.

Questions?

[info@uptimeinstitute.com](mailto:info@uptimeinstitute.com)

+1 206.706.4149

**UptimeInstitute™, LLC**

20 West 37th Street, 6th Floor, New York, NY 10018

+1 206.706.4149 · Fax: +1 206.706.3083

<http://uptimeinstitute.com> · <http://uptimeinstitute.com/professional-services>

© 2009-2012 Uptime Institute, LLC

TS102120-0812