

**Appendix 1 to  
Fourth Amendment of  
Master Services Agreement**

DIR-ESS-MSI-407  
June 6, 2019

**State of Texas**

**Department of Information Resources**



**Exhibit 2.3**

**IT Service Continuity Management**

**Multi-Sourcing Services Integrator**

**DIR-ESS-MSI-407**

June 6, 2019

## Table of Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>5</b>
<b>2</b>	<b>DISASTER RECOVERY.....</b>	<b>5</b>
2.1	General .....	5
2.2	Disaster Recovery Plan (DRP) .....	6
2.3	Disaster Recovery Testing.....	6
2.4	Disaster Recovery Testing for Server and Mainframe Services .....	7
2.5	Disaster Recovery Testing for Consolidated Data Centers .....	8
2.6	Disaster Recovery as a Service.....	8
<b>3</b>	<b>Disaster Recovery Testing for Active Directory Federation Services with Office 365.....</b>	<b>9</b>
<b>4</b>	<b>RECOVERY TIME OBJECTIVE (RTO) .....</b>	<b>9</b>
4.2	Disaster Recovery Level Application Requirements.....	11
<b>5</b>	<b>DISASTER RECOVERY FOR UTILITY SERVERS.....</b>	<b>13</b>
<b>6</b>	<b>OTHER CONSIDERATIONS .....</b>	<b>14</b>
6.1	Texas Emergency Management Council .....	14
<b>7</b>	<b>DISASTER RECOVERY PLAN CONTENTS .....</b>	<b>15</b>
7.1	Disaster Recovery Plan (DRP) Information .....	16
7.2	STANDARD DISASTER RECOVERY PLAN CONTENTS.....	16
<b>8</b>	<b>TECHNICAL RECOVERY GUIDE (TRG) CONTENTS .....</b>	<b>16</b>
8.1	Technical Recovery Documentation, Distribution, Review & Approval .....	16
8.2	Technical Recovery Procedures .....	17
8.3	Recovery Technology Standards .....	17

Change Log			
CCR/CN	Amendment	Date	Description
CCR-000XXX	Amendment 4	6/6/2019	<ul style="list-style-type: none"><li>• Clean up items: Section 2.2, 2.2.8 reference should be for 2.3 not 2.6 and Section 2.6 clean-up for misspelling, periods, DCS to DIR Customer, and capitalization.</li><li>• Updated the note in Section 5 related to the specified DR class in the CMDB.</li><li>• Deleted the tables in Sections 5.1 and 5.2.</li><li>• Revised the language in Section 2.6 to incorporate DRaaS Custom Full Recovery Exercise.</li></ul>

## 1 INTRODUCTION

Upon the occurrence of a disaster, the Successful Respondent and Service Component Providers (SCPs) shall promptly provide Disaster Recovery (DR) Services, in accordance with the applicable Disaster Recovery Plans (DRPs), including as described in, and in accordance with, the requirements of this Exhibit. In addition, this Exhibit sets forth certain requirements that the Successful Respondent and SCPs shall comply with in developing, maintaining, and implementing DRPs.

## 2 DISASTER RECOVERY

### 2.1 General

Texas has been pursuing a DR strategy based on having dual data centers to provide DR capabilities for each other. The highest levels of recovery are based on the use of the alternate Consolidated Data Center, and should be architected to meet the Recovery Time Objective (RTO) of Applications through appropriate replication and storage of data.

SCP(s) are responsible for providing the resources, including network connectivity between the Consolidated Data Centers, and to such disaster location facilities needed to support its disaster recovery strategy.

- 2.1.1 The Successful Respondent and SCP(s) shall work with DIR to establish declaration procedures and document those procedures in the Service Management Manual (SMM).
- 2.1.2 The Successful Respondent and SCP(s) will use the Disaster Recovery Plan (DRP) and Technical Recovery Guide (TRG) templates as defined in the SMM and referred to in **Section 7**.
- 2.1.3 The Successful Respondent and SCP(s) shall support testing of all Third-Party Disaster Recovery contracts in existence, and continue to support such contracts until such time that a successful test has been achieved for alternative solutions, or the DIR Customer requests the cancellation of the contract.
- 2.1.4 For IBM mainframes, SCP(s) will leverage and maintain the current DR strategy within both Consolidated Data Centers which includes processor recovery via Capacity Back Up (CBU) capabilities, data replication for Applications designated as having Class M RTO, and all necessary network, coupling facilities and channel resources required to meet the RTO.
- 2.1.5 If a disaster affects more than one (1) data center, such as a Legacy Data Center (LDC), and capacity is available to recover more than one (1) affected site, SCP(s) will proceed with recovery activities consistent with the Statewide Priorities, Categories, and RTOs as defined in the SMM.
- 2.1.6 The Successful Respondent shall design and implement new disaster recovery strategies as technologies evolve, including but not limited to hybrid cloud DR offerings, DR as a Service offerings, and so forth.

## 2.2 Disaster Recovery Plan (DRP)

The Successful Respondent and SCPs shall leverage and maintain DRPs where they currently exist in support of DIR Shared Services provided to DIR Customers and in relation to any DIR Customer-specific DRPs, in each case subject to the DIR Customer's prior review and approval.

- 2.2.1 The Successful Respondent and SCP(s) shall define and maintain DRPs where they do not exist in support of DIR Shared Services provided to DIR Customers and in relation to any DIR Customer-specific DRPs, in each case subject to the DIR Customer's prior review and approval.
- 2.2.2 DRPs shall include the DIR Customer-specific plan and the associated TRGs for each of the DIR Customer's Applications.
- 2.2.3 For all Applications, within three (3) months of the Commencement Date, the Successful Respondent shall update all existing DIR Customer-specific DRPs to reflect all changes implemented during the performance of Transition Services.
- 2.2.4 Such DRPs shall be updated annually to reflect all changes implemented over the course of SCPs' performance of the Services. TRGs shall be updated whenever a change is made to the environment or Application.
- 2.2.5 Updated DRPs and TRGs shall be sent for the applicable DIR Customer's review, and must document and demonstrate Successful Respondent's and SCPs' plan and SCP capability to restore Applications within their applicable RTOs.
- 2.2.6 The Successful Respondent and SCP(s) will adjust the applicable DRPs and TRGs whenever a DIR Customer needs and use of the Services change.
- 2.2.7 Ensure DR Recovery and Test environments in the hybrid cloud align to customer DR class requirements based on solutions available in the DCS program.
- 2.2.8 All DRPs that are developed by Successful Respondent and SCP(s) shall comply with all DIR Standards, including the National Institute of Standards and Technology Special Publication 800-34 and 800-66 Section 4.7, and shall be tested in accordance with applicable Laws and this **Exhibit 2.3**.

## 2.3 Disaster Recovery Testing

- 2.3.1 The Successful Respondent and SCP(s) will assume the DR test schedules in existence at the Commencement Date, and work with DIR Customers to ensure that the DIR Customer annual test schedules continue without disruption.
- 2.3.2 In cooperation with DIR, DIR Customers, and SCPs, the Successful Respondent shall establish and schedule reasonable windows to accomplish all DR testing for DIR Customer Applications as documented in the Successful Respondent's annual DR test plan and schedule, in accordance with the Disaster Recovery Test Schedule critical deliverable in **Exhibit 3.3 Critical Deliverables**.
- 2.3.3 The Successful Respondent shall assist DIR and the appropriate governance committee in prioritizing the test schedule of DIR Customer Applications, as specified in **Exhibit 1.2 Governance**.

- 2.3.4 The Successful Respondent shall actively engage DIR, DIR Customers, and SCP(s) in planning and preparation for annual test activities, including setting the objectives of the test. Each such test shall address the specific needs of each DIR Customer (e.g., split-window testing, preparation testing prior to an annual test, off-site tape location review and reconciliation, etc.) The Successful Respondent and SCP(s) test execution must demonstrate, at a minimum, the Successful Respondent's and SCP(s)' ability to meet or exceed the designated RTOs for those Applications in the event of a disaster.
- 2.3.5 SCP(s) will, in conjunction with DR tests, include the associated Mainframe and/or Servers, as required to meet the objectives of the test.
- 2.3.6 SCP(s) will conduct all testing activities in a manner designed to minimize impacts to active production, test, and development environments. If an active environment is required to execute the test, the SCP will, prior to the test, communicate the use of the environment to and obtain approval from the DIR Customer.
- 2.3.7 The Successful Respondent shall notify DIR and DIR Customers of any anticipated DR risks, in accordance with Risk Management, where a DIR Customer may choose not to participate in testing.
- 2.3.8 The Successful Respondent and SCP(s) shall evaluate the results of the test and identify potential corrective actions.
- 2.3.9 The Successful Respondent and SCP(s) shall provide initial test results to the DIR Customer and incorporate DIR Customer feedback into the final test results report.
- 2.3.10 The Successful Respondent and SCP(s) shall facilitate test result review sessions with the DIR Customer to gain consensus on the success level of the test (e.g., successful, successful with issues, unsuccessful, etc.) and to identify corrective actions.
- 2.3.11 The Successful Respondent shall coordinate the implementation across the appropriate SCPs and track corrective actions until resolved.

## **2.4 Disaster Recovery Testing for Server and Mainframe Services**

- 2.4.1 All Mainframe and Server Applications shall adhere to the DR classification definitions.
- 2.4.2 For all Applications designated as having Class P, Class 1, and Class M RTOs, SCP(s) will perform annual DR tests, except where directed otherwise by DIR and DIR Customers, and will complete the initial DR testing within twelve (12) months after the Commencement Date.
- 2.4.3 Upon DIR Customer request, SCP(s) will perform documented tabletop exercises, for all Applications eligible for testing, as described in the SMM, where no other DCS DR testing has been performed.
- 2.4.4 In cooperation with DIR Customers, SCP(s) will conduct DR failover tests for Applications architected with high availability failover environments, as requested by the DIR Customer; such failover tests may be conducted several times per year as required by Application criticality.
- 2.4.5 In conjunction with Application DR tests, SCP(s) will include the associated Utility Servers and other related servers.

## 2.5 Disaster Recovery Testing for Consolidated Data Centers

- 2.5.1 The Successful Respondent and SCP(s) shall perform an annual enterprise DR tabletop exercise of each Consolidated Data Center, to include the Successful Respondent's Shared Services Systems, in accordance with the applicable DRP.
- 2.5.2 The schedule for such testing shall be approved by DIR and appropriately coordinated with DIR and DIR Customers, providing the opportunity for DIR and DIR Customers to observe and participate in the test.

## 2.6 Disaster Recovery as a Service

Disaster Recovery as a Service (DRaaS) is a service offering provided to discretionary DIR Customers to support their Service Continuity Management. DRaaS is governed by the following objectives:

- The standard Server DRaaS offering is offered as a Class 3 Recovery strategy. All eligibility and recovery objectives for Class 3 apply.
- The standard Mainframe DRaaS offering is offered as a Class M Recovery strategy. All eligibility and recovery objectives for Class M apply.
- Custom Server and Mainframe DRaaS offerings may have different RTOs, RPOs and recovery strategies from those described in this **Exhibit 2.3**.
- Application support is NOT included in DRaaS.
- The DRaaS Customer owns and manages the production site and environment.
- Site level disaster assessment and disaster declaration authority is owned by the DRaaS Customer and DIR.
- DIR will initiate any disaster declaration in alignment with the established SMM.
- Return to normal (production site) process will be owned by the DRaaS Customer.
- Customers who utilize the standard DRaaS offering must have DCS Backup and Recovery Services. Customers who utilize a custom DRaaS offering must have partial DCS Backup and Recovery Services (e.g., replication of backups from DRaaS Customer's production environment).

The Successful Respondent shall perform the following services to support Disaster Recovery as a Service (DRaaS):

- 2.6.1 Develop and maintain one DR Plan for each DRaaS Customer.
- 2.6.2 For standard Server DRaaS Customers, conduct standard DR exercise planning, execution, and post-reporting processes in accordance with an annual Class 3 Enterprise Tabletop Exercise. Include standard DRaaS Customers in the same annual Class 3 Enterprise Tabletop Exercise with the full DIR Customers.
- 2.6.3 For standard Mainframe DRaaS Customers, conduct standard DR exercise planning, execution, and post-reporting processes in accordance with an annual Class M Full Recovery Exercise.
- 2.6.4 For custom Server and Mainframe DRaaS Customers, conduct standard DR exercise

- planning, execution, and post-reporting processes in accordance with the DR Class recovery strategy architected.
- 2.6.5 Measure DR Exercise results using the existing DR Service Levels and/or performance metrics.
- 2.6.6 Include DRaaS Customer data for DR Exercise planning and reporting.
- 2.6.7 Modify, maintain, and coordinate TRG format as needed.
- 2.6.8 Maintain Service Management Manual (SMM) in collaboration with SCPs and DIR.
- 2.6.9 Provide chargeback updates, reporting, data validation, and dispute management.
- 2.6.10 Provide Service Performance and Reporting support, operations reporting, training, compliance assessments, and validate Service Level results.
- 2.6.11 Provide tools support, including tools customization, ticket resolution, and trouble-shooting support.

### 3 Disaster Recovery Testing for Active Directory Federation Services with Office 365

DIR Customers may request annual DR testing of Active Directory Federation Service (ADFS) services designated as having Class 1 RTOs. The DIR Customer is responsible for performing the O365 configurations to enable testing. DR testing performed on ADFS servers will result in Agency production email services being unavailable while alternate ADFS services are brought on line to test and again when the service is returned to the primary servers. ADFS servers with applications at Class 3 will be covered in the annual enterprise Class 3 tabletop exercise. Integrated Test Lab (ITL) testing for O365 Federation Services is not available.

### 4 RECOVERY TIME OBJECTIVE (RTO)

Each Application that is addressed by a DR Plan has a designated RTO. DIR and DIR Customers will designate a DR Class and a DR Functional Category Code that issued to establish a priority for the recovery of Applications within the RTO. The RTO and Category Code must be maintained in the Contract Management Database (CMDB).

The codes are provided in **Table 1: DR Functional Category Codes**.

**Table 1: DR Functional Category Codes**

Code	Summary	Description
SAFE	Physical Security and Safety and Public Health	Includes all systems that support functions protecting physical security and safety of individuals and the public including but not limited to law enforcement, criminal justice, protective and related services, and homeland security; and systems that protect against imminent threats to public health including but not limited to disease outbreak and sanitation.

Code	Summary	Description
ASST	Essential assistance to vulnerable populations	Includes all systems that provide financial, medical, or other life-sustaining (e.g., food, shelter) assistance benefits or services to eligible citizens such as aged, persons with disabilities, unemployed persons, and child support recipients. Includes both disaster-related support and continuation of ongoing benefits. The focus for this category is support for the individual beneficiary.
TRAN	Public transportation and movement of goods	Includes all systems that enable the use of roads, bridges, ports, airports, and other critical infrastructures and other ancillary support of transportation.
GOVT	Essential government administration	Includes all systems that enable essential government functions including but not limited to critical vendor payments and financial transactions, especially those activities which if not performed would result in a significant financial loss to the state. The focus of this item is the business of government and may include items that support the functions above.
REGU	Education, regulation, taxation, business and economic development and general government administration	Includes all systems supporting government functions not listed above, including but not limited to providing for education, regulating industry and business entities, collecting taxes, supporting business and economic development and general government.

- 4.1.1 The Successful Respondent and SCP(s) shall perform DR Services to meet or exceed the applicable RTO for each Application, as indicated in the relevant DIR Customer DRP and tracked in the CMDB.
- 4.1.2 DIR Customers may change an Application's DR Class Level, using the appropriate DCS process. SCP(s) will perform a technical assessment of the Application's capability to meet the minimum requirements of the requested RTO, identifying any changes needed to meet the minimum requirements, and propose a solution, as needed, which implements those changes.

## 4.2 Disaster Recovery Level Application Requirements

4.2.1 To meet RTOs, each Application requires an appropriate supporting infrastructure, tools, and management; as described in the following table. Eligibility for DR testing for each DR class also is noted.

**Table 2: DR Exercise Eligibility**

<b>DR Level</b>	<b>RTO</b>	<b>RPO</b>	<b>Minimum Requirements</b>	<b>DR Exercise Eligibility</b>
Class P	1 hour	1 hour	<ol style="list-style-type: none"> <li>1. Application resides on servers within the Consolidated Data Centers</li> <li>2. Application has automatic failover</li> <li>3. Application has appropriate data replication</li> </ol>	Annual exercise of DR capability with the Successful Respondent, SCPs, and appropriate Third Parties
Class M	24 hours	1 hour	<ol style="list-style-type: none"> <li>1. Application resides on Mainframes within the Consolidated Data Centers</li> <li>2. Application has identified target Mainframes installed and managed in appropriate DR location</li> <li>3. Application has appropriate data replication</li> </ol>	Annual exercise of DR capability with Successful Respondent, SCPs, and appropriate Third Parties
Class 1	72 hours	6 hours	<ol style="list-style-type: none"> <li>1. Application resides on servers within the Consolidated Data Centers</li> <li>2. Application has identified target systems installed and managed in appropriate DR location</li> <li>3. Application has appropriate data replication</li> </ol>	Annual exercise of DR capability with Successful Respondent, SCPs, and appropriate Third Parties

<b>DR Level</b>	<b>RTO</b>	<b>RPO</b>	<b>Minimum Requirements</b>	<b>DR Exercise Eligibility</b>
Class 2A	7 days	48 hours	<ol style="list-style-type: none"> <li>1. Application resides on servers within the Consolidated Data Centers</li> <li>2. Application has identified target systems installed and managed in appropriate DR location with sufficient allocated storage</li> <li>3. Application has appropriate data backup and restore methods and processes</li> </ol>	Annual exercise or tabletop exercise of DR capability with the Successful Respondent, SCPs, and appropriate Third Parties.
Class 2B	14 days	48 hours	<ol style="list-style-type: none"> <li>1. Application has identified target systems installed in appropriate DR location with sufficient allocated storage</li> <li>2. Application has appropriate data backup and restore methods and processes</li> <li>3. Application has compatible tape technologies at appropriate DR location</li> </ol>	Annual tabletop exercise of DR capability Successful Respondent, SCPs, and appropriate Third Parties
Class 3	21 days	48 hours	<ol style="list-style-type: none"> <li>1. Application recovery is supported by “acquired at time of disaster” contracts from the Service Component Provider available to deploy in an appropriate DR location</li> <li>2. Application has appropriate data backup and restore methods and processes</li> <li>3. Application has compatible tape technologies at appropriate DR location</li> </ol>	<p>Annual enterprise tabletop exercise of DR capability with Service Providers and appropriate Third Parties</p> <p>Application recovery is out of scope</p> <p>Upon request during annual planning cycle, annual DIR Customer tabletop exercise of DR capability with Service Providers and appropriate Third Parties</p>
Class 4	Low Priority, as part of Service Restore	Low Priority, as part of Service Restore	Application has appropriate data backup and restore methods and processes	No Exercise

DR Level	RTO	RPO	Minimum Requirements	DR Exercise Eligibility
Class 6	14 days	48 hours	<ol style="list-style-type: none"> <li>1. Application resides on servers within the Consolidated Data Centers</li> <li>2. Application has identified target systems installed and managed in appropriate DR location with sufficient allocated storage</li> <li>3. Application has non-Transactional Data only. Agency Assumes the risk that the application will provide acceptable performance on slower disk</li> <li>4. Application has appropriate data backup and restore methods and processes</li> </ol>	Annual tabletop exercise of DR capability with Service Providers and appropriate Third Parties
Class 8	As per the DR Recovery contract	As per the DR Recovery contract	Application has appropriate data backup and restore methods and processes	Annual exercise of DR capability, as per DR contract, with Service Providers and appropriate Third Parties

4.2.2 On an ongoing basis, Successful Respondent shall report to DIR and DIR Customer where applications do not have appropriate methods to support an Application's DR Level rating, as part of Successful Respondent's annual DR Planning update and as part of Successful Respondent's annual Capacity Planning activities.

4.2.3 When an Application has not been included in DR Testing activities in more than two (2) years, Successful Respondent shall raise risks to DIR and DIR Customer, in conjunction with Risk Management, where SCP reasonably may not be able to meet that Application's RTO.

## 5 DISASTER RECOVERY FOR UTILITY SERVERS

1. For those servers classified as Utility Servers, Service Component Provider will recover Utility Server functions as per the specified DR class in the CMDB.
2. Service Component Provider will provide the necessary recovery of the appropriate corresponding Utility Server functions to an alternate recovery site, such as a Consolidated Data Center, or through a DR contract (e.g., BCRS, SunGard).
3. Service Provider will assist each DIR Customer to confirm the mapping of Utility Servers to the complete support structure for Application Servers and update the CMDB with this information.

## 6 OTHER CONSIDERATIONS

Related considerations for Successful Respondent and SCP support of DR.

- 1) Business continuity planning for DIR Customer business shall remain a function retained by DIR Customers; the Successful Respondent and SCP support the DIR Customer's business continuity planning through appropriate IT Service continuity planning.
- 2) DR and business continuity planning in respect of any sites, applications or systems that are managed, controlled or owned by the Successful Respondent and SCP shall be the responsibility of the Successful Respondent and SCP respectively. This includes all tools, facilities and technologies the Successful Respondent and SCP respectively uses to deliver the Services.
- 3) DR planning in respect of out-of-scope equipment shall remain the responsibility of the DIR Customers.
- 4) DIR Customer Test Slots:
  - a) The Successful Respondent will develop an Annual DR Test Plan and Schedule that will be limited to one (1) full DR exercise test slot and one tabletop DR exercise test slot per DIR Customer.
  - b) After annual planning, the testing schedule and test slots can only be changed throughout the year by mutual agreement between SCP and MSI. Consideration is based on business requirements, test environments, and the availability of resources.
  - c) Successful Respondent shall provide an annual DIR Customer DR plan update for each DIR Customer.
  - d) A test slot lasts up to one (1) week (seven (7) calendar days).
  - e) Full DR exercises are standard for Class P, Class M, Class 1, and Class 8 applications.
  - f) All of the DIR Customer Class P, Class M, Class 1, and Class 8 applications are eligible to be tested in the full DR exercise test slot.
  - g) If the ITL does not have sufficient capacity to support the applications within the full DR exercise test slot, then additional test slots will be made available to the DIR Customer.
  - h) DIR Customers are expected to fully use the ITL capacity to limit the number of test slots.

### 6.1 Texas Emergency Management Council

Any disaster that potentially affects the Consolidated Data Centers and Non-Consolidated Service Locations will require DIR and the DCS Service Component Providers and MSI to interact with the State's Emergency Management Council ("the Council"). The Council, composed of thirty-two (32) agencies, the American Red Cross and The Salvation Army, is established by Law to advise and assist the Governor of the State in all matters relating to disaster mitigation, emergency preparedness, disaster response, and recovery.

During major emergencies, the Council representatives convene at the State Operations Center to

provide advice on and assistance with response operations and coordinate the activation and deployment of State resources to respond to the emergency. Generally, State resources are deployed to assist local governments that have requested assistance because their own resources are inadequate to deal with an emergency. The Council is organized by emergency support function, or groupings of agencies, that have legal responsibility, expertise, or resources needed for a specific emergency response function.

## **7 DISASTER RECOVERY PLAN CONTENTS**

DIR expects the DRP and TRGs to provide sufficient level of detail for the Successful Respondent to successfully recover within the RTO.

## **7.1 Disaster Recovery Plan (DRP) Information**

DRPs should adhere to the format and contents as defined in the SMM as approved by DIR.

## **7.2 STANDARD DISASTER RECOVERY PLAN CONTENTS**

All DRPs that are developed by Successful Respondent and SCPs shall adhere to the Disaster Recovery Plan format and contents as defined in the SMM as approved by DIR and address the following topics unless otherwise directed by DIR, (e.g., Background, Scope, Declaration Criteria, Call-Out Procedure, Contingency Model Resource Plan, Key Documents and Procedures, Notification and Reporting, Technical Recovery Guide Activities for various system types).

## **8 TECHNICAL RECOVERY GUIDE (TRG) CONTENTS**

TRGs shall adhere to the format and contents as defined in the SMM as approved by DIR and address the following items, unless otherwise directed by DIR and the respective DIR Customer.

### **8.1 Technical Recovery Documentation, Distribution, Review & Approval**

1. Server configurations will be identified, documented, and maintained for each environment ensuring technical recovery to required configurations can be accomplished, such as:
  - a. Hardware;
  - b. OS;
  - c. Storage; and
  - d. Network.
2. Server and application environment dependencies will be identified, documented, and maintained ensuring technical recovery steps are known and can be sequenced appropriately to ensure business services operations can be restored including:
  - a. OS dependencies required to support applications and databases;
  - b. Directories, File system and other mount points required such as Network File Service (NFS);
  - c. Inter-server environment relationships and dependencies;
  - d. Security dependencies;
  - e. Interface dependencies;
  - f. Application and/or database specific dependencies; and
  - g. Operations dependencies associated to the server/application such as required job task procedures (processes and services which will be enabled).
3. TRGs will be maintained, reviewed and approved. This will include processes of quality control performed by the MSI and review and concurrence with the DIR Customer.
4. The process of maintaining currency of the TRGs will be fully documented and repeatable.
5. TRGs will capture operational elements of the environments including:
  - a. System operational requirements which need to be re-enabled as required to support the business purpose of the environment

- b. Post boot instructions required
- c. Integration instructions required for cross teams support in restoring the overall business purpose of the environment

## **8.2 Technical Recovery Procedures**

1. SCPs will utilize technical recovery approaches based on sequenced recovery events and restoration of associated dependencies for each environment. This sequenced order of recovery events will be documented for every environment and be relevant to end-to-end recovery requirements.
2. Focus of technical recovery will be focused on restoration of business service ensuring all related recovery dependencies are addressed.
3. Backup and recovery technical requirements and related processes in the context of recovering specific environments will be fully described as part of the technical recovery procedures as required to enable end-to-end technical recovery of the business purpose for each environment. This includes specifics associated to each environment including distinction of:
  - a. Hardware/OS recovery
  - b. Application software and related OS configuration recovery
  - c. Non-database data recovery
  - d. Database recovery

## **8.3 Recovery Technology Standards**

1. Enterprise recovery technology standards will be fully documented and demonstrate technology standards used to enable technical recovery of all environments supported.
  - a. Hardware/OS recovery for all platforms supported
  - b. Application software and related OS configuration recovery
  - c. Non-database data recovery
  - d. Database recovery (all DB platforms)