

**CREW LEAVE RECONCILIATION SYSTEM**

**SYSTEM OPERATION DOCUMENT**

**MAB/GROUP IT/SOD/CLRS/1.2**

**Prepared by :**

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1. - MANUAL ADMINISTRATION

# RECORD OF REVISION

| **No.** | **Description Of Changes** | **Issue No.** | **Revision No.** | **Author** | **Effective Date** |
| --- | --- | --- | --- | --- | --- |
| 1 | Original | 1 | 0 | Chandana P | 10-Mar-18 |
| 2 | Integrate MHCLRS with SSO. CHG0018163 | 1 | 1 | Prashant Chauhan | 21-May-20 |
| 3 | Updated the Contract Management | 1 | 1 | Prashant Chauhan | 25-June-20 |
| 4 | Updated the CR | 1 | 2 | Prashant Chauhan | 07-Aug-20 |
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| 1 | 1-1 | 1 | 0 | 10-03-18 |  |  |  |  |  |  |
|  | 1-2 | 1 | 0 | 10-03-18 |  |  |  |  |  |  |
|  | 1-2 | 1 | 1 | 25-06-20 |  |  |  |  |  |  |
|  | 1-2 | 1 | 2 | 07-08-20 |  |  |  |  |  |  |
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| 4 | 4-1 | 1 | 0 | 10-03-18 |  |  |  |  |  |  |
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|  | 4-5 | 1 | 2 | 29-01-21 |  |  |  |  |  |  |
|  | 4-6 | 1 | 0 | 10-03-18 |  |  |  |  |  |  |
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*Table 1-Distribution List*

# LIST OF ABBREVIATIONS

The following are the abbreviations used for the purpose of simplification.

|  |  |
| --- | --- |
| **Abbreviation** | **Denote** |
| AMS | Application Maintenance & Support |
| MAB | Malaysia Airlines Berhad |
| SOD | System Operating Document |
| SSO | Single Sign On |

*Table 2-List of Abbreviations*

# 

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1. - MANUAL BACKGROUND

# INTRODUCTION

This is the CLRS SOD, hereinafter referred to as ‘the Policy’ provides comprehensive operating procedures within the scope and application herein defined in Part 2 Section 3.0 for Malaysia Airlines Berhad (MAB).

# PURPOSE

The objective of this document is to provide relevant information required to operate and support a completed project, ready for implementation and handover to IT Operations.

# SCOPE AND APPLICATION

This document covers relevant information required to operate and support the CLRS system in the production environment. This covers the maintenance operation of the system, database and interfaces.

# DEFINITION OF TERMS

The below table depicts abbreviations used in this document.

|  |  |
| --- | --- |
| **Abbreviation** | **Denote** |
| CLRS | Crew Leave Reconciliation System |
| EAI | Enterprise Application Integration |
| MAB | Malaysia Airlines Berhad |
| SFTP | Secure File Transfer Protocol |
| SOD | System Operating Document |

*Table 3-Definition of Terms*

# REFERENCES

The below table depicts the references related to this SOD.

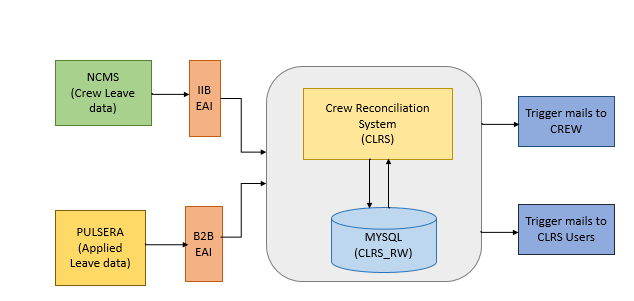
|  |  |  |
| --- | --- | --- |
| **No.** | **Documents** | **Description** |
| 1 | SOW | Statement of Work as supplied as agreed upon between TCS and MAB |
| 2 | Technical Design Document | Document highlighting the Technical Design & architecture of the collaboration platform. This is supplied by TCS |
| 3 | Test Plan Document | Document highlighting the Test plan for the collaboration platform. This is supplied by TCS |

*Table 4-References*

1. – OVERVIEW OF BUSINESS PROCESS

# OVERVIEW OF BUSINESS PROCESS

Following is the overview of the business process.



*Figure 1-Overview of Business Process*

Crew Reconciliation System (CLRS) sends reminder mails to crew to apply their leaves by validating the leave data received from NCMS and Pulsera systems. CLRS application also facilitate to trigger mails with discrepancy data as an attachment to the CLRS Users.

1. - MANUAL CONTENT TITLE

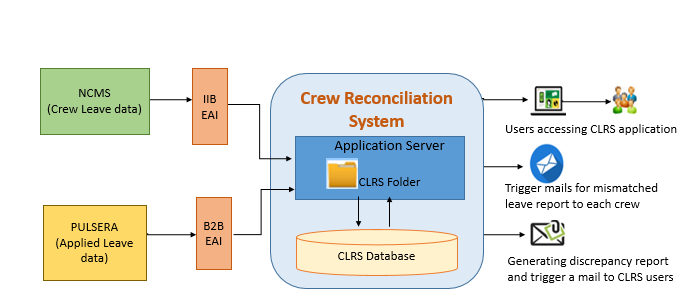
# SYSTEM OVERVIEW

CLRS application is used to send reminder mails to the crew members to apply leaves .The application has a functionality to validate the leave data in NCMS against the actual leave applied in Pulsera. The application also facilitates to change the job schedule time, crew mail template and also provides view to discrepancy data and notified crew data.

The CLRS application falls under BCD 4.

# SYSTEM CONCEPT DIAGRAM

Following is the system concept diagram.



*Figure 2 System Concept Diagram*

# INTERFACES

### 4.3.1. User Interfaces

* Google Chrome is the recommended browser to access CLRS application as it offers best suitability and stability.
* The usage of Internet Explorer, Mozilla Firefox, Safari and Opera will also provide the similar stability and access.

### 4.3.2. System Interfaces

Following are the interfacing systems for CLRS application:

* NCMS Interface

CLRS application is interfaced with NCMS through EAI. The application receives crew leave data in CSV format from NCMS system.

* Pulsera Interface

CLRS application is interfaced with Pulsera through EAI. The application receives applied crew leave data in CSV format from Pulsera System.

# WARRANTY AND MAINTENANCE PERIOD

The following table contains warranty and maintenance period details.

|  |  |  |
| --- | --- | --- |
|  | **Start Date** | **End Date** |
| Product Warranty | 01-Apr-2018 | 30-Sep-2018 |
| Maintenance and Support contract | 01-Apr-2018 | 30-Sep-2018 |

# ROLES AND RESPONSIBILITIES

Following are the roles and responsibilities of the team:

| **Role** | **Responsibilities** |
| --- | --- |
| Midrange Team | Troubleshooting infrastructure related problems. |
| DBA Team | Maintaining database |
| Application Support  (AMS) | * Monitoring system performance * Providing application support * Deploying application and publishing it to user. * Maintaining CLRS application second level support |
| MAB Helpdesk | * As single point of contact to coordinate when CLRS problems occurred. * Coordinating problem reporting to the respective supporting team. |

*Table 4 –Roles and Responsibilities*

# TECHNICAL SPECIFICATIONS

### 4.6.1. Hardware Specifications

Following are the hardware specifications:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hostname** | **IP Address** | | **Environment** | **Server Function** | **Location** | **CPU** | **RAM (GB)** | **Processor Speed** |
| MASG-1SRASJAVAAPP1 | 10.221.4.29 | PROD | | Application | Azure VM : (Public cloud-Singapore) | 2 | 4 | E5-2673 v3 @ 2.40GHz |
| MASG-1SRASJAVADB1 | 10.221.6.28 | PROD | | Database | Azure VM : (Public cloud-Singapore) | 2 | 4 |
| MASG-3SRASJAVAAPP1 | 10.221.12.29 | DEV/TEST | | Application | Azure VM : (Public cloud-Singapore) | 2 | 4 |
| MASG-3SRASJAVADB1 | 10.221.14.26 | DEV/TEST | | Database | Azure VM : (Public cloud-Singapore) | 2 | 4 |

*Table 5* –*Hardware Specifications*

### 4.6.2. Software Specifications

Following are the software specifications

|  |  |  |
| --- | --- | --- |
| **No.** | **Software** | **Specification** |
|  | Application Server | apache-tomcat-9.0.36 |
|  | Web Server | Apache - 2.4.23 |
|  | Database | MySQL – 8.0.20 |
|  | Front-end | IE 8+, Firefox 5+, Chrome 18+, Safari 5+, Opera 9+ |

*Table 6-SoftwareSpecification*

### 4.6.3. Communication / Network Specification

Following are the communication/ network specification:

|  |  |
| --- | --- |
| **Category** | **Configuration** |
| Protocol | Server : HTTP  Client : HTTP  Mail : SMTP |

*Table 7–Communication and network specification*

### 4.6.4. User And Equipment Locations

Following are the user and equipment locations.

|  |  |  |  |
| --- | --- | --- | --- |
| **Hostname** | **Location** | **Contact Name** | **Contact Number** |
| MASG- 1SRASJAVAAPP1 | MASG Azure | GD\_TCSMidrange | 1800817802 - Option 3 |
| MASG-1SRASJAVADB1 | MASG Azure | GD\_TCSDatabase | 1800817802 - Option 4 |
| MASG-3SRASJAVAAPP1 | MASG Azure | GD\_TCSMidrange | 1800817802 - Option 3 |
| MASG-3SRASJAVADB1 | MASG Azure | GD\_TCSDatabase | 1800817802 - Option 4 |

*Table 8-User and Equipment locations*

### 4.6.5. File ManagemenT

Following are the file management details.

| **LIBRARIES AND FILES** | **LOCATION (MOUNT POINT)** |
| --- | --- |
| Apache | /usr/local/apache |
| Tomcat | /tomcat |
| File Server / Mount Point | /ftpdata |
| MySQL and Databases | /mysql  /mysqldata  /mysqlbackup |

*Table 9**–File management*

#### 4.6.5.1. DBMS SETUP

A total of 9 tables exist in the database instance. The database do not use database specific features such as stored procedures.

DB instance: clrs

jdbc.driverClassName = com.mysql.jdbc.Driver

jdbc.url = jdbc:mysql://1srasjavadb1.mas.net:3036/clrs

# TECHNICAL OPERATIONS GUIDE

### 4.7.1. Installation Procedures

* The application will be deployed in Tomcat Server as war file format by AMS Deployment Team. The following is the Tomcat Server URL.

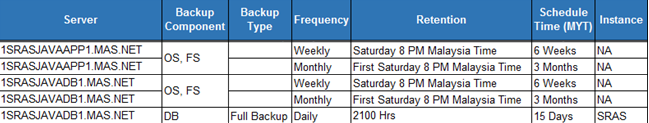
<http://1srasjavaapp1.mas.net:8080/manager/>

* The DBA team will perform the Database setup through MySQL.

### 4.7.2. Backup And Recovery

**SERVER LEVEL:**

Recovery Services vault is an entity that stores all the backups and recovery points that have been created over time. The vault also contains the backup policies that will be applied to the virtual machines being backed up when the Recovery services initiates a backup job at the scheduled time, it triggers the backup extension to take a point-in-time snapshot. The Azure Recovery service uses the VMSnapshot extension in Windows, and the VMSnapshotLinux extension in Linux. The extension is installed during the first VM backup. Once the Azure Backup service takes the snapshot, the data is transferred to the vault. To maximize efficiency, the service identifies and transfers only the blocks of data that have changed since the previous backup. When the data transfer is complete, the snapshot is removed and a recovery point is created.



*Figure 3 Server Backup and Retention*

**DATABASE LEVEL:**

Following are the database level details.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Server Name** | **Backup Type** | **Frequency** | **Retention** | **Schedule Time (MYT)** |
| MASG-1SRASJAVADB1 | Full backup | Daily | 15 days | 21:00 hrs |
| MASG-3SRASJAVADB1 | Full backup | daily | 15 days | 12:00 hrs |

*Table 10 –Database Level*

|  |  |  |  |
| --- | --- | --- | --- |
| **Server/Database** | **Frequency** | **Schedule (MYT)** | **Remarks** |
| MASG-1SRASJAVAAPP1 | Daily | 1.00 AM MYT | Daily incremental backup is applicable only for /ftpdata/CLRS/NCMS/ /ftpdata/CLRS/Pulsera/ |

4.7.3. System Startup and restart

Following are the system startup and restart procedures.

|  |  |
| --- | --- |
| **Procedure** | **Description** |
| Tomcat 🡪 Bin 🡪 startup.sh | Execute startup.sh to start Tomcat services in application server |
| Apache 🡪 Bin 🡪 apachectl start | Execute apachectl to start Apache services in web server |
| /mysql/inst/mysql/bin/mysqld –defaults-file=my.cnf & | To start MySQL as mysql user. |

*Table 11 –System startup and restart*

### 4.7.4. System Shutdown

Following are the system shutdown procedures.

|  |  |
| --- | --- |
| **Procedure** | **Description** |
| Tomcat 🡪 Bin 🡪 shutdown.sh | Execute shutdown.sh to bring down Tomcat services in application server |
| Apache 🡪 Bin 🡪 apachectl stop | Execute apachectl to stop Apache services in web server |
| mysqladmin –u root –p shutdown | To stop MySQL as mysql user. |

*Table 12-System Shutdown*

**Note**: Application services have to be taken care by AMS team, also any issue related to application related services has to be addressed by AMS team.

### 4.7.5. MONITORING Tools

CLRS servers and processes are monitored by SCOM.

### 4.7.6. Source Code Version Control

CLRS Binaries are available as per the following table.

|  |  |
| --- | --- |
| **Binaries** | **Description** |
| clrs.war | http://svn.mas.net/svn/SRAS/SRAS/CLRS/ 03\_Executables/03\_PROD/b1\_CHG0011203 |
| Code Base | http://svn.mas.net/svn/SRAS/SRAS/CLRS/ 02\_Source\_Code/01\_Application/branches/Branch1/ |

*Table 13-Source code version control*

### 4.7.7. Preparation Of Production Environment

The application is a web-based application and hence a browser is required for accessing the application across devices.

#### 4.7.7.1. NETWORK DEFINITIONS

All user PCs/Laptops that are connected to MAB Local LAN/WIFI will be able to access the CLRS Application.

#### 4.7.7.2. DESKTOP CONFIGURATION

Web Browser with Java enabled. Refer Sec 4.6.2 for software / hardware requirements.

### 4.7.8. Baseline Performance Information

Following is the baseline performance information.

|  |  |
| --- | --- |
| **Activity** | **Expected Response Time** |
| Loading each module | < 5 seconds |
| Loading each screen | < 5 seconds |

*Table 14 –Baseline performance information*

# MAINTENANCE AND SUPPORT

### 4.8.1. Problem Solving

* Users will log any problem pertaining CLRS to Helpdesk by calling the team or by sending an email to HELPDESK.
* Helpdesk will be equipped with guidelines on how to perform 1st level troubleshooting and log problem accordingly.

#### 4.8.1.1 FREQUENT ISSUES AND RESOLUTIONS

Following table contains the frequent issue faced and resolution for it.

|  |  |
| --- | --- |
| **Issue** | **Resolution** |
| Cannot login to CLRS | The user might not registered to access the application. The user should raise a request to get access. |

*Table 15* – *Frequent issues and Resolutions*

#### 4.8.1.2 FINDING LOGS AND TRACKING ISSUES

* Get the CLRS log file from the path /tomcat/apache-tomcat-9.0.0.M11/logs/
* Track the error log in the log file based on the reference number

### 4.8.2. Problem Categorization and Escalation

The helpdesk will analyze the problem and assign a ticket number and a severity level which is mutually agreed by the user. However, the severity will be revised downward based on business assessment and impact as shown in the following table.

|  |  |  |
| --- | --- | --- |
| **Severity** | **Code** | **Definition of Severity Level** |
| Critical | S1 | Total Biz Operation Disruption |
| High (Urgent) | S2 | Partial Biz Operation Disruption |
| Moderate (Minor) | S3 | No critical impact to Biz operations, Workaround is available |
| Low (Minor) | S4 | Problem that cause inconvenience |

*Table 16-Problem categorization and escalation*

* If there are any issues with CLRS application, users will escalate to MAB IT HELPDESK.
* Level 1 MAB Helpdesk will create the problem ticket and route to the MAB second level support.
* For application related problem will be assigned to AMS team, system related problem to Midrange team and database related problem to DBA team.

| **Users** | **Business Unit** | **1st Level Support** | **2nd Level Support** |
| --- | --- | --- | --- |
| Business Users | Business Support | MAB IT Helpdesk | IT Operations - AMS |
| IT Operations - DBA |
| IT Operations - Infra |

*Table 17 –Support levels*

### 4.8.3. Application / Technical Support

The following is the Problem Resolution Structure:

| **2nd Level Support** | **Name** | Contact No/Memo |
| --- | --- | --- |
| Application Support | SITO-CLRS | CLRS Applications :  Prashant Chauhan, +918305968583  Krishnakant Bairagi, +919977839491  Group email : GD\_AMS\_CLRS@malaysiaairlines.com |
| System Support | TCS\_MIDRANGE | 1800817802 # 3 Option  [GD\_TCSMidrange@malaysiaairlines.com](mailto:GD_TCSMidrange@malaysiaairlines.com) |
| Database Support | TCS\_DATABASE | 1800817802 # 4 Option  [GD\_TCSDatabase@malaysiaairlines.com](mailto:GD_TCSDatabase@malaysiaairlines.com) |
| Network Support | TCS\_NETWORK | 1800817802 # 1 Option  GD\_TCSNetwork@malaysiaairlines.com |

*Table 18-Application/Technical support*

# USER GUIDE

Refer to the Appendix for details.

# ACCESSING THE APPLICATION

Users can access the application by using the following URL in their browsers.

<http://clrs.mas.net/clrs/>

# CONTRACT MANAGEMENT

Following are the contract management details.

|  |  |  |
| --- | --- | --- |
|  | **Contract** | **Parties** |
| 1. | Service contract from AMS support service | Signed between MAB and ATOS |

*Table 19* – *Contract management*

# HANDOVER ITEMS

The following documents / items will be handed over to Operations together with this System Operation Document during the Handover session.

* UAT signoff by Business Owner
* CLRS User Guide
* CLRS Technical Manuals and Installation Guides
* Softcopy of this System Operations Document

# INFORMATION SECURITY

### 4.13.1. Audit And Compliance Requirements

Following table contains the audit and compliance requirements.

| **Activity** | **Frequency** | **Responsible Party** |
| --- | --- | --- |
| Perform ID review every quarter and submit result to IRS | Quarterly | ID Admin |
| Update user access matrix and submit to IRS | Yearly | System Owner |
| Install Critical Security Patches for the application and submit report to IRS | Quarterly | System Owner |
| Perform Backup restoration | Yearly | System Owner |
| Review and update security documentation and submit to IRS:   * Super/privilege IDs and access * Security Controls Setting * Audit Logs setting * System bypass * List of connections and integration * List of used ports * Data encryption setting * Application/system schematic diagram | Yearly | System Owner |

*Table 20 –Audit and Compliance requirement*

### 4.13.2. Password And Policy Compliance

Following are the password and policy compliance details:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No.** | **Password Policy Requirements** | **Yes** | **No** | **Remarks** |
|  | Password length at least 8 characters (minimum) | Yes |  | Uses LDAP authentication for login |
|  | Alphanumeric | Yes |  | NA |
|  | Change temporary password at first logon |  | No | Uses LDAP authentication for login |
|  | Password expiry = 90 days (maximum) | Yes |  | NA |
|  | Password reuse generation = 5 (minimum) | Yes |  | NA |
|  | Account lock out after 3 failed login attempts | Yes |  | NA |
|  | Application shall disconnect or suspend inactive sessions= 15 Minutes | Yes |  | NA |
|  | Wrong password shall be recorded in an audit log | Yes |  | NA |

*Table 21 –Password and Policy compliance*

### 4.13.3. User Access Matrix

The following table shows the user access matrix of CLRS application

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **USER TYPE** | **ACCESS LEVEL** | | | |
| **Download Reports** | **View** | **Update** | **Delete** |
| Admin | X | X | X | X |
| User | X | X |  |  |

*Table 22 –User access matrix*

# DOCUMENTATION AND REFERENCES

**Following are the documentation and references details.**

|  |  |  |
| --- | --- | --- |
| **S. No.** | **Document** | **Location of source** |
| 1. | System Operation Document | http://svn.mas.net/svn/SRAS/SRAS/CLRS/ 01\_Documents/01\_Application\_Documents |
| 2. | User Guide | http://svn.mas.net/svn/SRAS/SRAS/CLRS/ 01\_Documents/01\_Application\_Documents |

*Table 23* – *Documentation and Reference*

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# APPENDIX

* User Guide



* Interface Control Document



* SSO -Single Sign On - Integration [CHG0018163]

**** ****

|  |  |  |
| --- | --- | --- |
| **Ref. No** | **Description** | **Implementation Date** |
| CHG0018163 | Integrate MHCLRS with SSO. | 21-May-2020 |
| CHG0018709 | Migration from mysql-connector-java-5.1.26 to mysql-connector-java-8.0.20 | 23-July-2020 |
| CHG0015324 | CLRS - Discrepancy report included the new status, Leave type requested. | 23-July-2020 |
| CHG0019610 | Azure backup | CLRS Application SOD Updated | Additional incremental backup for a file system in below listed servers | 29-Jan-2021 |

**PATCH MANAGEMENT REPORT**

Application : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Owner **: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **Date** | **Patch / Service Pack Applied** |
|  |  |
|  |  |
|  |  |
|  |  |

**Prepared By: Approved By:**

**.................................................... ....................................................**

**System Admin System Owner**

**BACKUP RESTORATION REPORT**

Application : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Owner **: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **Date** | **Status of Restoration** |
|  |  |
|  |  |
|  |  |
|  |  |

**Prepared By: Approved By:**

**.................................................... ....................................................**

**Backup Admin System Owner**

**NON COMPLIANCE REPORT**

Application : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Owner **: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Date** | **Reference Number** | **Description** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Prepared By: Approved By:**

**.................................................... ....................................................**

**System Admin System Owner**

**END OF DOCUMENT**