

Oracle Banking Credit Facilities Process Management Development Security Guide



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Preface

1.1 Before Begin

Before begin, user can refer to the **Getting Started User Guide**. It helps user to know the basic prerequisites to get started with Oracle Banking Credit Facilities Process Management.

1.2 Pre-requisites

Specify the **User ID** and **Password**, and login to **Home** screen.

1.3 Purpose

This guide is designed to help the user to quickly get acquainted with the Customer Standard Instructions maintenance process.

1.4 Acronyms and Abbreviations

The list of the acronyms and abbreviations used in this guide are as follows:

Table 1-1 Acronyms and Abbreviations

| Abbreviation | Description |
|--------------|---------------------|
| RWA | Risk Weighted Asset |

1.5 Audience

This guide is intended for the central administrator of the Bank who controls the system and application parameters and ensures smooth functionality and flexibility of the banking application.

1.6 Basic Actions

Table 1-2 Basic Actions

| Action | Description |
|------------------|---|
| Approve | Used to approve the initiated report. This button is displayed, once the user click Authorize . |
| Audit | Used to view the maker details, checker details, and report status. |
| Authorize | Used to authorize the report created. A maker of the screen is not allowed to authorize the report. Only a checker can authorize a report, created by a maker. |

Table 1-2 (Cont.) Basic Actions

| Action | Description |
|-----------------------------|---|
| Close | Used to close a record. This action is available only when a record is created. |
| Confirm | Used to confirm the performed action. |
| Cancel | Used to cancel the performed action. |
| Compare | Used to view the comparison through the field values of old record and the current record. This button is displayed in the widget, once the user click Authorize . |
| Collapse All | Used to hide the details in the sections. This button is displayed, once the user click Compare . |
| Expand All | Used to expand and view all the details in the sections. This button is displayed, once the user click Compare . |
| New | Used to add a new record. When the user click New , the system displays a new record enabling to specify the required data. |
| Ok | Used to confirm the details in the screen. |
| Save | Used to save the details entered or selected in the screen. |
| View | Used to view the report details in a particular modification stage. This button is displayed in the widget, once the user click Authorize . |
| View Difference only | Used to view a comparison through the field element values of old record and the current record, which has undergone changes. This button is displayed, once the user click Compare . |
| Unlock | Used to update the details of an existing record. System displays an existing record in editable mode. |

1.7 Conventions

The following text conventions are used in this document:

Table 1-3 Conventions

| Convention | Meaning |
|-----------------|--|
| boldface | Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary. |
| <i>italic</i> | Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values. |
| monospace | Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter. |

1.8 Critical Patches

Oracle advises customers to get all their security vulnerability information from the Oracle Critical Patch Update Advisory, which is available at [Critical Patches, Security Alerts and Bulletins](#). All critical patches should be applied in a timely manner to ensure effective security, as strongly recommended by [Oracle Software Security Assurance](#).

1.9 Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

1.10 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookupctx=acc&id=docacc>.

1.11 Related Resources

For more information on any related features, refer to the following documents

- *Oracle Banking Credit Facilities Process Management Getting Started User Guide.*
- *Oracle Banking Credit Facilities Process Management Maintenance User Guide.*

1.12 Screenshot Disclaimer

Personal information used in the interface or documents is dummy and does not exist in the real world. It is only for reference purposes.

1.13 Icons

The following icons are used in the screens.

Table 1-4 Icons - Common





| Symbol/Icon | Function |
|---|----------------|
|  | Minimize |
|  | Maximize |
|  | Close |
|  | Perform Search |

Table 1-4 (Cont.) Icons - Common













| Symbol/Icon | Function |
|---|--|
|  | Open a list |
|  | Add a new record |
|  | Navigate to the first record |
|  | Navigate to the last record |
|  | Grid view |
|  | List view |
|  | Refresh |
|  | Click this icon to add a new row. |
|  | Click this icon to delete an existing row. |
|  | Click to view the created record. |
|  | Click to modify the fields. |
|  | Click to unlock, delete, authorize or view the created record. |

Table 1-5 Symbols and Icons - Audit Details









| Symbol/Icon | Function |
|---|-------------------------------|
|  | A user |
|  | Date and time |
|  | Unauthorized or Closed status |
|  | Authorized or Open status |

Table 1-6 Symbols and Icons - Widget

| Symbol/Icon | Function |
|---|---------------------|
|  | Open status |
|  | Unauthorized status |
|  | Closed status |
|  | Authorized status |

1.14 Post-requisites

After finishing all the requirements, please log out from the Home screen.

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How to Address the OWASP

This topic describes about how to address the OWASP Top10 in Oracle Banking Credit Facilities Process Management

- [Injection](#)
This topic describes about injection.
- [Broken Authentication and Session Management](#)
This topic describes about Broken Authentication and Session Management.
- [Cross-Site Scripting \(XSS\)](#)
This topic describes about Cross-Site Scripting (XSS).
- [Insecure Direct Object References](#)
This topic describes about Insecure Direct Object References.
- [Security Misconfiguration](#)
This topic describes about Security Misconfiguration.
- [Sensitive Data Exposure](#)
This topic describes about Sensitive Data Exposure.
- [Missing Function Level Access Control](#)
This topic describes about Missing Function Level Access Control.
- [Cross-Site Request Forgery \(CSRF\)](#)
This topic describes about Cross-Site Request Forgery (CSRF).
- [Using Components with Known Vulnerabilities](#)
This topic describes about using components with known vulnerabilities.
- [Unvalidated Redirects and Forwards Network Security](#)
This topic describes about Unvalidated Redirects and Forwards Network Security.

2.1 Injection

This topic describes about injection.

Injection flaws occur when an application sends untrusted data to an interpreter. Injection flaws are very prevalent, particularly in legacy code. They are often found in SQL, LDAP, Xpath, or SQL queries; OS commands; XML parsers, SMTP Headers, program arguments, etc. Injection flaws are easy to discover when examining code.

Oracle Banking Credit Facilities Process Management uses Oracle database and it has adequate inbuilt techniques to prevent SQL injections as underlined below:

- **Use of prepared statements (parameterized queries):** Oracle Banking Credit Facilities Process Management uses parameterized JPQL/SQL queries with bind variables to construct and execute SQL statements in JAVA.
- **Escaping all user supplied input:** This third technique is to escape user input before putting it in a query. If it is a concern that rewriting the dynamic queries as prepared statements or stored procedures might break the application or adversely affect performance, then this might be the best approach for the purpose. However, this

methodology is frail compared to using parameterized queries and there is no guarantee that it will prevent all SQL Injection in all situations

2.2 Broken Authentication and Session Management

This topic describes about Broken Authentication and Session Management.

In Oracle Banking Credit Facilities Process Management, applications are stateless micro services based architecture.

Cryptography used

PCI council defines Strong Cryptography as:

Cryptography based on industry-tested and accepted algorithms, along with strong key lengths and proper key-management practices. Cryptography is a method to protect data and includes both encryption (which is reversible) and hashing (which is not reversible, or “one way”). SHA-1 is an example of an industry-tested and accepted hashing algorithm. Examples of industry-tested and accepted standards and algorithms for encryption include AES (128 bits and higher), TDES (minimum double-length keys), RSA (1024 bits and higher), ECC (160 bits and higher), and ElGamal (1024 bits and higher).

Encryption algorithm:

The application leverages AES encryption algorithm to store sensitive information into properties file. This algorithm uses 256-bit secret key for encryption and decryption, which would be stored at property file.

Hashing algorithm:

Oracle Banking Credit Facilities Process Management platform service leverages HS-512 hashing algorithm with random salt for JWT.

2.3 Cross-Site Scripting (XSS)

This topic describes about Cross-Site Scripting (XSS).

XSS for Oracle Banking Credit Facilities Process Management handled by OJET. Hence application developer's need not to handle specifically.

2.4 Insecure Direct Object References

This topic describes about Insecure Direct Object References.

Use of prepared statements (parameterized queries):

Oracle Banking Credit Facilities Process Management uses parameterized JPQL/SQL queries with bind variables to construct and execute SQL statements in JAVA.

Input Validation:

Oracle Banking Credit Facilities Process Management is a web based application, the request data from browser to server will be passed using request headers and request parameters. All the request fields coming from the client are validated using white list validation to prevent cross-site scripting.

User defined methods used for input validation, which checks each character of the request field with a range of allowed characters. In addition, OJET framework handles the input attribute validations. User defined methods `escapeJavaScript()`, `escapeHTML()` and `escapeURL()` will sanitize the output data before flushing it into client browser.

`escapeJavaScript()` will escape all characters except immune JavaScript characters and alphanumeric characters in the ASCII character set. All other characters are encoded using the `\xHH` or `\uHHHH` notation for representing ASCII or Unicode sequences.

`escapeHTML()` will escape the characters with equivalent HTML entities obtained from the lookup map. Lookup map will have entities such as `amp`, `quot`, `lt`, `gt` etc.

`escapeURL()` will encode the URL using `URLEncoder` class.

White list validation is also used to restrict Image/signature/excel upload and to check rights for every operation performed by user.

Field validation:

Field level validations exist for all mandatory fields. Database too had limits on the type and the length of data. Blacklisted characters are not allowed in the mandatory fields. Nevertheless, Oracle Banking Credit Facilities Process Management has free-text fields, which takes all data, entered by the user, as a String.

Restriction on Blacklist characters:

Blacklisted characters on Oracle Banking Credit Facilities Process Management handled by OJET. Hence application developer's need not to handle specifically.

2.5 Security Misconfiguration

This topic describes about Security Misconfiguration.

Configuration files:

Configuration files are securely placed inside the Classes folder of the WEB-INF folder, which is not publicly accessible

Exception handling in java:

Different types of exceptions can rise in application. Java exceptions handled using try catch blocks available in java. Sometimes we use the Throw statement to throw an exception, which is caught by the catch block. Caught exceptions will be written into the log files for the debug purpose whenever required. Whenever any exception occurs in application, proper information used to send to the front end user by showing alert.

BI Publisher Reports – generation and access:

The application uses a sandbox for placing the generated reports file into a sandbox area. The sandbox is placed in a specified location (the location will be specified in the properties file) on the server. The application validates if the user has explicit Rights to generate Reports.

2.6 Sensitive Data Exposure

This topic describes about Sensitive Data Exposure.

- Secure Transformation of Data (SSL)
- Sign-On messages

- CACHE Control in Servlet and jsp
- Clickjacking/Frame-bursting

Secure Transformation of Data (SSL):

The Oracle Banking Credit Facilities Process Management allows a deployer to configure the application such that all HTTP connections to the application are over SSL/TLS. In other words, all HTTP traffic in the clear will be prohibited; only HTTPS traffic will be allowed. It is mandatory to enable this option in a production environment, especially when WebLogic Server acts as the SSL terminator.

A two-way SSL is used when the server needs to authenticate the client. In a two-way SSL connection, the client verifies the identity of the server and then passes its identity certificate to the server. The server then validates the identity certificate of the client before completing the SSL handshake.

In order to establish a two-way SSL connection, need to have two certificates, one for the server and the other for client. This is required for de-centralized setup of application.

Below configuration has to be ensured in weblogic.xml within the deployed application ear.

- Cookies are set with Http only as true
- Cookie secure flag set to true
- Cookie path to refer to deployed application

Always make sure Cookies are set with always Auth Flag enabled by default for WebLogic server.

Sign-On messages:

Below table shows, the general Sign-On messages which would be displayed to the user during invalid authentication

Table 2-1 Sign-On messages

| Message | Explanation |
|---|---|
| User Authentication Failed | An incorrect user ID or password was entered. |
| User Status is Disabled. Please contact your System Administrator | The user profile has been disabled due to number of dormancy days allowed for the user has exceeded the dormancy days configured in the system. |
| User Status is Locked. Please contact your System Administrator | The user profile has been locked due to an excessive number of attempts to login, using an incorrect user ID or password. The number of attempts could have matched either the successive or the cumulative number of login failures (configured for the system). |

CACHE Control in Servlet and jsp:

There are three basic HTTP response headers that prevent a page from being cached to disk. Different browsers handle them in slightly different ways, so they need to be used in combination to ensure all browsers do not cache the specific page. These headers are "Expires", "Pragma" and "Cache-control". In addition, these headers can either be sent directly by the server or placed in the HTML code as HTTP-EQUIV META tags within the HEAD section. The "Expire" header gives a date at which point the page should expire and no longer be cached. Internet Explorer supports a date of "0" for immediately and any negative number

for already expired. The "Pragma: no-cache" header indicates that the page should not be cached.

Clickjacking/Frame-bursting:

Oracle JET handles clickjacking/Frame-bursting attack. Oracle Banking Credit Facilities Process Management uses the X-Frame-Options HTTP response header to indicate whether or not a browser should be allowed to render a page in a or . This is used to avoid Clickjacking attacks, by ensuring that the content is not embedded into other sites.

2.7 Missing Function Level Access Control

This topic describes about Missing Function Level Access Control.

It is likely that users working in the same department at the same level of hierarchy need to have similar user profiles. In such cases, you can define a Role Profile that includes access rights to the functions that are common to a group of users. A user can be linked to a Role Profile by which you give the user access rights to all the functions in the Role Profile.

Application level access has implemented via the Security Management System (SMS) module.

SMS supports "ROLE BASED" access of Screens and different types of operations.

Roles are granted to a user at the level of each branch, thereby controlling what functions the user can perform in which branch.

Oracle Banking Credit Facilities Process Management solutions supports dual control methodology, wherein every operation performed has to be authorized by another user with the requisite rights.

2.8 Cross-Site Request Forgery (CSRF)

This topic describes about Cross-Site Request Forgery (CSRF).

Oracle Banking Credit Facilities Process Management services are stateless. Oracle Banking Credit Facilities Process Management generates JWT upon successful authentication of the users. The generated token works to prevent CSRF.

2.9 Using Components with Known Vulnerabilities

This topic describes about using components with known vulnerabilities.

Source code scanning done using the latest fortify to identify the sources code issue and will provide the proper fix for the reported issues.

3rd party libraries scanning for every release has been done to validate if any security issues rise for any of the components or not. Update the 3PL with latest security patch or upgraded to latest version.

2.10 Unvalidated Redirects and Forwards Network Security

This topic describes about Unvalidated Redirects and Forwards Network Security.

Application uses 302 redirect wherever required. Oracle Banking Credit Facilities Process Management uses `response.sendRedirect(newURL)`.

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Securing API Services

This topic describes about Securing API Services.

Different applications deployed on disparate platforms and using different infrastructure need to be able to communicate and integrate seamlessly with Oracle Banking Credit Facilities Process Management in order to exchange data. The Oracle Banking Credit Facilities Process Management Service API Gateway will cater to these integration needs.

The integration needs supported by the Gateway can be broadly categorized from the perspective of the Gateway as follows:

- **Inbound application integration:** Used when any external system needs to add, modify or query information within Oracle Banking Credit Facilities Process Management.
- **Outbound application integration:** Used when any external system needs to be accessed for processing transactions within Oracle Banking Credit Facilities Process Management.

Glossary

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