# Centralized Cruise Database Oracle Package Testing Documentation

## Overview:

The Centralized Cruise Database (CCD) is used to track information about each PIFSC research cruise including activities, regions, etc. to remove the need for each division/program to manage this information. The CCD Oracle Package (CCDP) was developed to provide functions and stored procedures for the CCD. The stored procedures perform record operations on the database and the functions translate primary key values and return calculated values for the [Cruise Data Management Application (CRDMA)](../../../CRDMA/docs/Cruise%20Data%20Management%20Application%20-%20Technical%20Documentation.docx). There are two different methods for test case verification: SQL and PL/SQL. The standard method for defining formal, repeatable test cases for the CCDP and verifying them are defined in this document. All SQL queries should be executed on the CEN\_CRUISE schema. This SOP requires the process to be completed using Oracle SQL Developer.

## Resources:

* [CCD Documentation](../../Centralized%20Cruise%20Database%20-%20Technical%20Documentation.docx)
* [PL/SQL Coding Conventions](../../Centralized%20Cruise%20Database%20-%20PLSQL%20Coding%20Conventions.docx)
* [CCDP Test Cases](CCDP%20Test%20Cases.xlsx)
* [CRDMA Documentation](../../../CRDMA/docs/Cruise%20Data%20Management%20Application%20-%20Technical%20Documentation.docx)
  + CRDMA CCDP Tests

## Definitions:

* Test Case Definitions: This [excel file](CCDP%20Test%20Cases.xlsx) is used to define all formal test cases
* (SQL verification only) Verification Templates: These excel files (<verification_templates>) are used to list the individual test cases in a given category that are defined in the Test Case Definitions. The templates use excel formulas to verify that the results of a given script execution match the verified results.
* Verification Exports: These files ([verification\_templates\automated](verification_templates/automated)) are used to verify the results of a given test script match the verified results using a file comparison tool to streamline the process.
* CCDP: The CCD Oracle Package is CCD\_CRUISE\_PKG

## Test Case Verification SOP:

* Setup Test Cases:
  + Purge CCD and DVM records from the database
    - Execute [delete\_all\_DVM\_recs.sql](../../../SQL/queries/delete_all_DVM_recs.sql)
    - Execute [delete\_ref\_data.sql](../../../SQL/queries/delete_ref_data.sql)
  + Load test data
    - Execute the corresponding test CCD data and DVM rule loading scripts
* Automated Verification:
  + (SQL verification only) Export the data from the database after the DVM has been executed on the test data and compare it to the Verification Exports.
    - SOP:
      * Execute the corresponding DVM test script(s)
      * Generate the data reports (execute the [CCDP verification query](#CCDP_verification_query) for the given test case category and export the results in a .csv file with the specified naming convention)
      * Open a diff tool (e.g. WinMerge) and compare the exported query results (e.g. category\_2\_CCDP\_verification20200423.csv for a report generated on 4/23/2020) with the corresponding Verification Export (e.g. [category\_2\_CCDP\_verification.csv](verification_templates/automated/category_2_CCDP_verification.csv)) in the [verification\_templates\automated](verification_templates/automated) folder
        + If the two files' content matches exactly then the test cases have been verified successfully
  + (PL/SQL verification only)
    - SOP:
      * Execute the corresponding Test Cases Setup scripts
      * Clear the "script output" window
      * Execute the corresponding DVM test script
      * Copy the content in "script output" and save as a temporary text file (e.g. category\_1\_script\_output\_20200716.txt)
      * Open a diff tool (e.g. WinMerge) and compare the saved script output with the corresponding Verification Export (e.g. [category\_1\_script\_output\_verification.txt](verification_templates/automated/category_1_script_output_verification.txt)) in the [verification\_templates\automated](file:///C:\Users\Jesse.Abdul\Documents\Version%20Control\Git\centralized-cruise-database\docs\test%20cases\DVM_PKG\verification_templates\automated) folder
        + If the two files' content matches exactly then the test cases have been verified successfully

## Test Case Definition SOP:

* Update the Test Case Definitions in the [CCDP Test Cases](CCDP%20Test%20Cases.xlsx) workbook to add the expected results for the new test cases in the corresponding section based on the type of test case
* SQL Verification:
  + Update the corresponding <verification_templates> file(s) to add the expected result for the new test cases
    - Description: These Verification Templates translate the individual test cases in a given category defined in the [Test Case Definitions](CCDP%20Test%20Cases.xlsx) into their corresponding query results so they can be compared with the query results from subsequent script executions. These template files contain excel formulas to compare the expected verified results with the actual results of a given script execution.
    - SOP:
      * Update the corresponding test data loading script (e.g. [category\_1\_load\_test\_data.sql](SQL/category_1_load_test_data.sql)) and DVM rule script (e.g. [category\_1\_load\_DVM\_rules.sql](../DVM_PKG/SQL/category_1_load_DVM_rules.sql)) to load database records necessary to setup the test case conditions that can be used to verify that the expected outcome was produced.
        + [Cruise\_Leg\_DDL\_DML\_generator](../../Cruise_Leg_DDL_DML_generator.xlsx) can be used to generate the DML to load the DVM test data records in to the corresponding data loading script
        + \*\*Note: do not include any database fields in the verification queries that have a random element like primary key values or date/time values that depend on when the script was executed otherwise the automated test case verification approach will not work properly.
      * Update the corresponding CCDP test script(s) (e.g. [category\_2\_exec\_test\_cases.sql](SQL/category_2_exec_test_cases.sql)) to execute the new test cases and update the database accordingly.
      * (For new test case categories only) Define a naming convention for the Verification Template and Verification Export
      * Execute the SQL query for the given test case category and export the results in a .csv file with the specified naming convention for the Verification Export
      * Copy the exported data from the .csv file into the "Database Export" worksheet of the corresponding verification template.
      * Open the "verification" worksheet and search for the "false" value specifying "values" in the "Look in" option, update the excel formulas as necessary. Confirm there are no matches found, if so then the test cases have been successfully verified
  + Replace the corresponding Verification Export .csv file in the [verification\_templates\automated](verification_templates/automated) folder and include it in the version control commit.
* PL/SQL Verification:
  + Update the corresponding script [Verification Export](verification_templates/automated) file to add the expected result for the new test cases
    - Description: These Verification Export files contain the script output for the PL/SQL verification test cases.
    - SOP:
      * Update the corresponding test data loading script (e.g. [category\_1\_load\_test\_data.sql](SQL/category_1_load_test_data.sql)) and DVM rule script (e.g. [category\_1\_load\_DVM\_rules.sql](../DVM_PKG/SQL/category_1_load_DVM_rules.sql)) to load database records necessary to setup the test case conditions that can be used to verify that the expected outcome was produced.
        + [Cruise\_Leg\_DDL\_DML\_generator](file:///C:\Users\Jesse.Abdul\Documents\Version%20Control\Git\centralized-cruise-database\docs\Cruise_Leg_DDL_DML_generator.xlsx) can be used to generate the DML to load the test data records in to the corresponding data loading script
        + \*\*Note: do not include any database fields in the verification queries that has a random element like primary key values or date/time values that depend on when the script was executed otherwise the automated test case verification approach will not work properly.
      * Update the corresponding DVM test script(s) (e.g. [category\_1\_exec\_test\_cases.sql](SQL/category_1_exec_test_cases.sql)) to include the PL/SQL code to execute the new test cases and produce the desired script output
      * (For new test case categories only) Define a naming convention for the Verification Export
      * Copy the "script output" produced by the test script and save it as a text file with the specified naming convention for the Verification Export
        + Use a diff tool to verify that the script output matches the expected results defined in the corresponding script [verification export](verification_templates/automated) file
  + Include the new/modified Verification Export file in the version control commit to replace the previous version (if any).
* Update documentation (if necessary) and commit changes to the version control system.

## Test Case Types:

* DVM Tests
  + Description: The [test cases workbook](CCDP%20Test%20Cases.xlsx) lists instances of each CCDP test case for each test case category that is implemented in the CCD.
    - The columns in each test case category worksheet are based on the information that is necessary to verify the test cases
  + Category 1 Cases (PL/SQL verification)
    - These test cases verify the different error conditions for the CCDP that can be feasibly tested are handled correctly
      * A list of error codes that are tested in this category for the CCDP can be found in the [Business Rules List](../../Centralized%20Cruise%20Database%20-%20Business%20Rule%20List.xlsx) where the "Scope" column values are "CCD PKG Errors"
    - Test cases setup
      * To streamline the test case verification process a single script was compiled to purge the CCD and DVM data as well as execute all individual scripts listed below to setup the test cases for this test case category: [category\_1\_exec\_all\_scripts.sql](SQL/category_1_exec_all_scripts.sql)
        + Load test data:

Test data: [category\_1\_load\_test\_data.sql](SQL/category_1_load_test_data.sql)

DVM rules: [category\_1\_load\_DVM\_rules.sql](file:///C:\Users\Jesse.Abdul\Documents\Version%20Control\Git\centralized-cruise-database\docs\test%20cases\DVM_PKG\SQL\category_1_load_DVM_rules.sql)

* + - Test case script: [category\_1\_exec\_test\_cases.sql](SQL/category_1_exec_test_cases.sql)
    - Validation Issues:
      * Verification Export: [category\_1\_script\_output\_verification.txt](verification_templates/automated/category_1_script_output_verification.txt)
  + Category 2 Cases (SQL verification):
    - Description: These test cases verify that the CCD\_CRUISE\_PKG.DEEP\_COPY\_CRUISE\_SP procedure is processed successfully
    - To streamline the test case verification process a single script was compiled to purge the CCD and DVM data as well as execute the individual scripts listed below for this test case category: [category\_2\_exec\_all\_scripts.sql](SQL/category_2_exec_all_scripts.sql)
      * Load test data:
        + Test data: [category\_1\_load\_test\_data.sql](SQL/category_1_load_test_data.sql)
        + DVM rules: [category\_1\_load\_DVM\_rules.sql](../DVM_PKG/SQL/category_1_load_DVM_rules.sql)
      * Test case script: [category\_2\_exec\_test\_cases.sql](SQL/category_2_exec_test_cases.sql)
    - Validation Issues:
      * Execute the [CCDP Verification Query](#CCDP_verification_query)
      * Verification Files:
        + Template: [category\_2\_CCDP\_verification.xlsx](verification_templates/category_2_CCDP_verification.xlsx)
        + Export: [category\_2\_CCDP\_verification.csv](verification_templates/automated/category_2_CCDP_verification.csv)

## Procedures:

* DEEP\_COPY\_CRUISE\_SP
  + Verifying Test Cases
    - APEX Application
      * Execute the test cases by navigating to the given Cruise record and clicking the "Deep Copy" button on the View/Edit Cruise page.
      * Verify each test case by checking the success/error message after each button click, it should match the value in the "Expected Result" column
    - When the "Error Exists?" column is "N" verify that the values were copied over successfully using the [test\_case\_verification\_queries.sql](SQL/test_case_verification_queries.sql) script and define the "Cruise Name" column value at runtime for the :CRUISE\_NAME bind variable
      * Confirm that the value of the "VALUES\_EQUAL\_YN" column is "Y" for all returned rows, if so the test case has been successfully verified

## Functions:

* + Defining Test Cases
    - TBD
  + Verifying Test Cases
    - TBD

## Appendix:

* CCDP Verification Query:

Select \* from CCD\_CCDP\_DEEP\_COPY\_CMP\_V order by 1, 3;