



PROCESS AND ARTIFACT COMPLIANCE TOOL

User Manual

February 2020

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TABLE OF CONTENTS

Table of Contents

Section1: PROCESS AND ARTIFACT COMPLIANCE TOOL COMPONENTS	1
1.1 PROCESS AND ARTIFACT COMPLIANCE TOOL OVERVIEW	1
1.2 PROJECT LIST	2
1.2.1 PROJECT INTERFACE - NEW PROJECT	4
1.2.2 PROJECT INTERFACE - VIEW PROJECT	5
1.2.3 PROJECT - CONFIGURATION ITEM - ARTIFACT (SEE SECTION 2 FOR FULL DETAILS)	6
1.2.3.1 PROJECT- CONFIGURATION ITEM – NEW CONFIGURATION ITEM	6
1.2.4.....	8
PROJECT- SYSTEM REQUIREMENTS.....	8
1.2.4.1 PROJECT- SYSTEM REQUIREMENTS LIST.....	8
1.2.4.2 PROJECT- CREATING A NEW SYSTEM REQUIREMENT	9
1.2.4.3 PROJECT- EDITING A SYSTEM REQUIREMENT	10
1.2.4.4 PROJECT- VIEWING A SYSTEM REQUIREMENT	10
1.2.4.5 PROJECT- EXPORTING SYSTEM REQUIREMENTS	10
1.2.4.6 PROJECT- IMPORTING SYSTEM REQUIREMENTS.....	11
1.2.4.7 PROJECT- RENUMBERING SYSTEM REQUIREMENTS	11
1.2.4.8 PROJECT- DELETING SYSTEM REQUIREMENTS.....	11
1.3 PROJECT- PROBLEM REPORTS OVERVIEW	12
1.3.1 PROJECT- THE PROBLEM REPORTS LIST	12
1.3.2 PROJECT- NEW PROBLEM REPORT.....	13
1.3.3 PROJECT- EDITING A PROBLEM REPORT	14
1.3.4 PROJECT- VIEWING A PROBLEM REPORT.....	14
1.3.5 PROJECT- All PROBLEM REPORTS.....	14
1.3.6 PROJECT- MY PROBLEM REPORTS.....	14
1.3.7 PROJECT - PRs ASSIGNED TO ME.....	15
1.3.8 PROJECT- OPEN PROJECT REPORTS.....	15
1.3.9 PROJECT- PROBLEM REPORTS - HISTORY OVERVIEW	15
1.3.9.1 PROJECT- PROBLEM REPORTS - HISTORY LIST	15
1.3.9.2 PROJECT- PROBLEM REPORTS - HISTORY – EDIT PROBLEM HISTORY	16
1.3.9.3 PROJECT- PROBLEM REPORTS - HISTORY – DELETE PROBLEM HISTORY	16
1.4 PROJECT- REVIEW STATUS	17
Section 2: CONFIGURATION ITEM - ARTIFACTS INTERFACE	18
2.1 CONFIGURATION ITEM - ARTIFACTS INTERFACE overview	18
2.2 THE CONFIGURATION ITEM LIST	18
2.3 CREATING A NEW CONFIGURATION ITEM	19
2.4 EDITING A CONFIGURATION ITEM	20
2.5 VIEWING A CONFIGURATION ITEM	20
2.6 EXPORTING A CONFIGURATION ITEM	21
2.7 CONFIGURATION ITEM - NAVIGATION.....	22

TABLE OF CONTENTS

2.7.1	CONFIGURATION ITEM- HIGH LEVEL REQUIREMENTS.....	23
2.7.1.1	CONFIGURATION ITEM - HIGH LEVEL REQUIREMENTS LIST.....	23
2.7.1.2	CONFIGURATION ITEM - CREATING A NEW HIGH LEVEL REQUIREMENT.....	24
2.7.1.3	CONFIGURATION ITEM - EDITING A HIGH LEVEL REQUIREMENT.....	25
2.7.1.4	CONFIGURATION ITEM – LINKING HIGH LEVEL REQUIREMENTS TO SYSTEM EQUIREMENTS	25
2.7.1.5	CONFIGURATION ITEM - VIEWING A HIGH LEVEL REQUIREMENT	26
2.7.1.6	CONFIGURATION ITEM - EXPORTING HIGH LEVEL REQUIREMENTS.....	26
2.7.1.7	CONFIGURATION ITEM - IMPORTING HIGH LEVEL REQUIREMENTS	26
2.7.1.8	CONFIGURATION ITEM - RENUMBERING HIGH LEVEL REQUIREMENTS	27
2.7.1.9	CONFIGURATION ITEM - DELETING HIGH LEVEL REQUIREMENTS	27
2.7.2	CONFIGURATION ITEM- LOW LEVEL REQUIREMENTS	28
2.7.2.1	CONFIGURATION ITEM - LOW LEVEL REQUIREMENTS LIST.....	28
2.7.2.2	CONFIGURATION ITEM - CREATING A NEW LOW LEVEL REQUIREMENT	29
2.7.2.3	CONFIGURATION ITEM - EDITING A LOW LEVEL REQUIREMENT	30
2.7.2.4	CONFIGURATION ITEM – LINKING LOW LEVEL REQUIREMENTS TO SYSTEM REQUIREMENTS.....	30
2.7.2.5	CONFIGURATION ITEM - VIEWING A LOW LEVEL REQUIREMENT	31
2.7.2.6	CONFIGURATION ITEM - EXPORTING LOW LEVEL REQUIREMENTS	31
2.7.2.7	CONFIGURATION ITEM - IMPORTING LOW LEVEL REQUIREMENTS	31
2.7.2.8	CONFIGURATION ITEM - RENUMBERING LOW LEVEL REQUIREMENTS	32
2.7.2.9	CONFIGURATION ITEM - DELETING LOW LEVEL REQUIREMENTS	32
2.7.3	CONFIGURATION ITEM- TEST CASES	33
2.7.3.1	CONFIGURATION ITEM - TEST CASES LIST	33
2.7.3.2	CONFIGURATION ITEM - CREATING A NEW TEST CASE.....	34
2.7.3.3	CONFIGURATION ITEM - EDITING A TEST CASE.....	34
2.7.3.4	CONFIGURATION ITEM – LINKING TEST CASES TO HIGH LEVEL REQUIREMENTS	35
2.7.3.5	CONFIGURATION ITEM - VIEWING A TEST CASE	35
2.7.3.6	CONFIGURATION ITEM - EXPORTING TEST CASES.....	36
2.7.3.7	CONFIGURATION ITEM - IMPORTING TEST CASES	36
2.7.3.8	CONFIGURATION ITEM - RENUMBERING TEST CASES.....	37
2.7.3.9	CONFIGURATION ITEM - DELETING TEST CASES.....	37
2.7.4	CONFIGURATION ITEM - SOURCE CODES.....	38
2.7.4.1	CONFIGURATION ITEM - SOURCE CODES LIST.....	38
2.7.4.2	CONFIGURATION ITEM - CREATING A NEW SOURCE CODE	39
2.7.4.3	CONFIGURATION ITEM - EDITING A SOURCE CODE	41
2.7.4.4	CONFIGURATION ITEM – LINKING SOURCE CODES TO LOW LEVEL REQUIREMENTS.....	42
2.7.4.5	CONFIGURATION ITEM – LINKING SOURCE CODES TO HIGH LEVEL REQUIREMENTS	43
2.7.4.6	CONFIGURATION ITEM - VIEWING A SOURCE CODE	43
2.7.4.7	CONFIGURATION ITEM - EXPORTING SOURCE CODES	44
2.7.4.8	CONFIGURATION ITEM - IMPORTING SOURCE CODES	44
2.7.4.9	CONFIGURATION ITEM – SCANNING GITHUB FILES	46
2.7.4.10	CONFIGURATION ITEM – SCANNING GITLAB FILES.....	49
2.7.4.11	CONFIGURATION ITEM - RENUMBERING SOURCE CODES.....	51
2.7.4.11.12	CONFIGURATION ITEM – SOURCE CODE - CODE COVERAGE	52
2.7.4.12.1	CONFIGURATION ITEM – SOURCE CODE – INSTRUMENTING C CODE.....	52
2.7.4.12.2	CONFIGURATION ITEM – SOURCE CODE – SETTING UP COVERAGE.....	56
2.7.4.12.3	CONFIGURATION ITEM – SOURCE CODE – PROCESSING LOG FILES	57
2.7.4.12.4	CONFIGURATION ITEM - DELETING SOURCE CODES	59
2.7.5	CONFIGURATION ITEM – REQUIREMENTS TRACING MATRIX.....	59
2.7.5.1	CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX LIST	59
2.7.5.1	CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - SYSTEM REQUIREMENTS → HIGH	

TABLE OF CONTENTS

LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS/TEST CASES → SOURCE CODE	60
2.7.5.2 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX – SYSTEM REQUIREMENTS → HIGH LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS.....	61
2.7.5.3 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - SYSTEM REQUIREMENTS → HIGH LEVEL REQUIREMENTS	61
2.7.5.4 CONFIGURATION ITEM – REQUIREMENTS TRACING MATRIX - HIGH LEVEL REQUIREMENTS → TEST CASES	62
2.7.5.5 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - HIGH LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS.....	62
2.7.5.6 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - LOW LEVEL REQUIREMENTS → SOURCE CODE.....	63
2.7.5.7 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - ALL.....	63
2.7.5.8 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX – EXPORT RTM.....	64
2.7.6 CONFIGURATION ITEM- DOCUMENTS	65
2.7.6.1 CONFIGURATION ITEM - DOCUMENTS LIST	65
2.7.6.2 CONFIGURATION ITEM - CREATING A NEW DOCUMENT	66
2.7.6.3 CONFIGURATION ITEM - EDITING A DOCUMENT.....	67
2.7.6.4 CONFIGURATION ITEM - VIEWING A DOCUMENT.....	67
2.7.6.5 CONFIGURATION ITEM – DOWNLOADING DOCUMENTS.....	67
2.7.6.6 CONFIGURATION ITEM - DELETING DOCUMENTS.....	67
2.7.6.7 CONFIGURATION ITEM – DOCUMENT VERSIONING	67
2.7.7 CONFIGURATION ITEM- REVIEWS.....	68
2.7.7.1 CONFIGURATION ITEM - REVIEWS LIST	68
2.7.7.2 CONFIGURATION ITEM - CREATING A NEW REVIEW.....	69
2.7.7.3 CONFIGURATION ITEM - EDITING A REVIEW	73
2.7.7.4 CONFIGURATION ITEM - VIEWING A REVIEW	73
2.7.7.5 CONFIGURATION ITEM - DELETING REVIEWS	73
2.7.7.6 CONFIGURATION ITEM – REVIEWS - ACTION ITEMS	74
2.7.7.6.1 CONFIGURATION ITEM - REVIEWS LIST	74
2.7.7.6.2 CONFIGURATION ITEM - CREATING A NEW ACTION ITEM	75
2.7.7.6.3 CONFIGURATION ITEM - EDITING AN ACTION ITEM.....	75
2.7.7.6.4 CONFIGURATION ITEM - VIEWING AN ACTION ITEM	76
2.7.7.6.5 CONFIGURATION ITEM - DELETING ACTION ITEMS	76

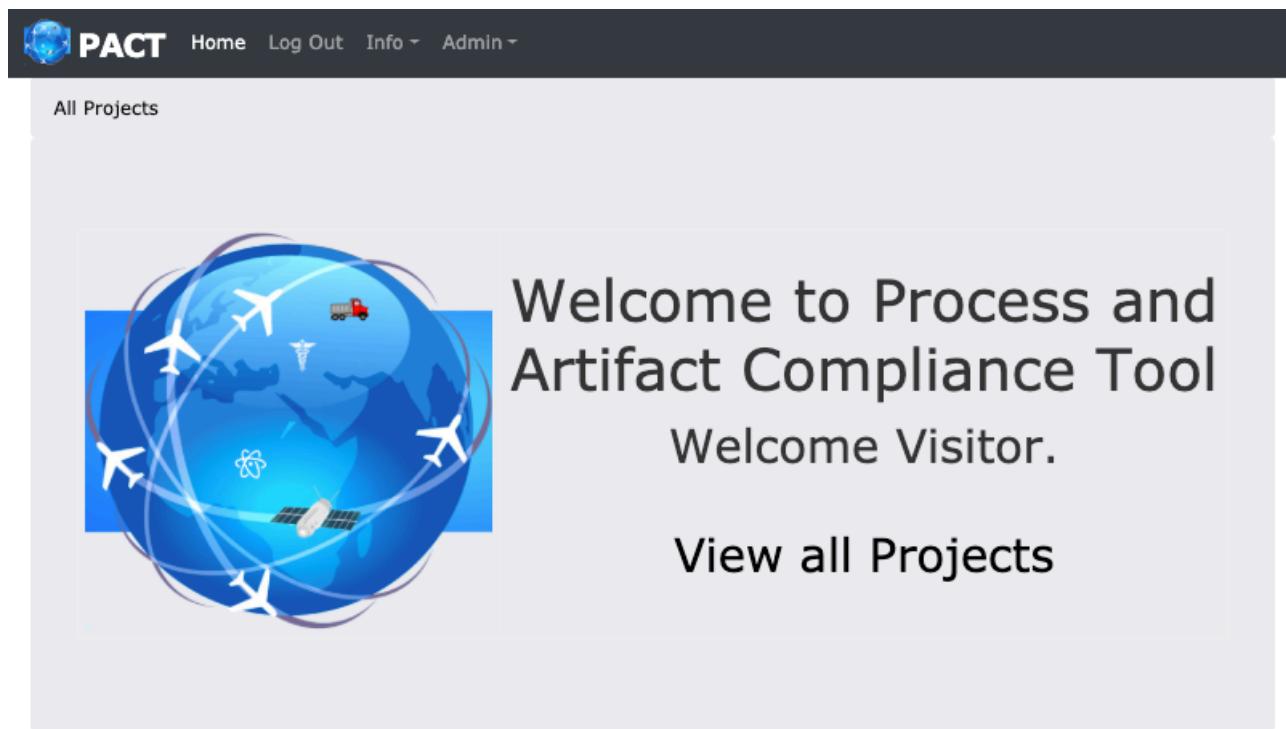
Section 1: PROCESS AND ARTIFACT COMPLIANCE TOOL COMPONENTS

1.1 PROCESS AND ARTIFACT COMPLIANCE TOOL OVERVIEW

The Process and Artifact Compliance Tool (PACT) is a web-based system for managing compliance documentation templates and checklists in various industries, for example DO-178B and DO-254 in the aerospace industry, ISO 9001, HIPAA, TS 16949 in the automotive industry.

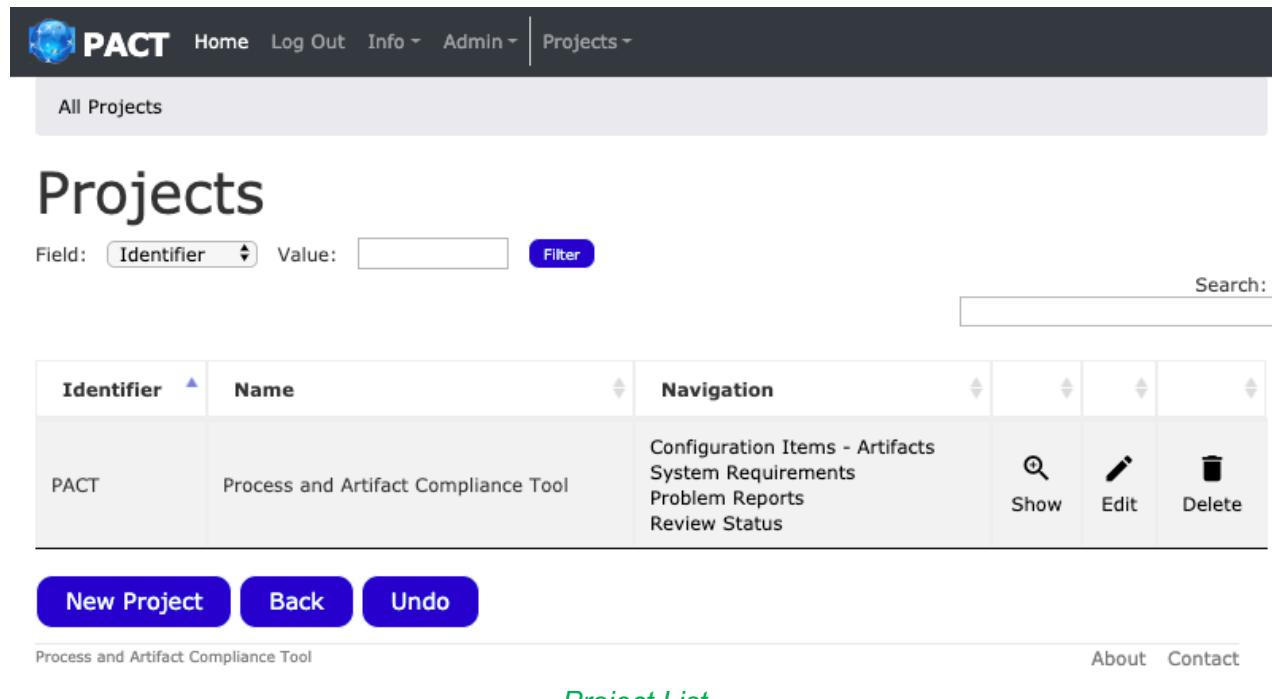
All of the tools and templates are accessed from The PACT Home Page.

Guidance for use of the core systems within the Project Interface is provided in Sections 2 of this manual. These systems are accessed through various links on the Project List page.



1.2 PROJECT LIST

Selecting the **View All Projects** link will navigate to the **Project List**.



The screenshot shows the PACT Project List interface. At the top, there is a dark header bar with the PACT logo and navigation links: Home, Log Out, Info, Admin, and Projects. Below the header, a breadcrumb bar says "All Projects". The main title "Projects" is displayed in large, bold letters. Underneath the title are search and filter controls: "Field: Identifier", "Value: [input field]", "Filter", and a "Search: [input field]". The main content area is a table with one row. The table has columns for "Identifier", "Name", and "Navigation". The "Identifier" column contains "PACT". The "Name" column contains "Process and Artifact Compliance Tool". The "Navigation" column lists "Configuration Items - Artifacts", "System Requirements", "Problem Reports", and "Review Status". To the right of the table are three buttons: "Show" (with a magnifying glass icon), "Edit" (with a pencil icon), and "Delete" (with a trash bin icon). At the bottom of the screen are buttons for "New Project", "Back", and "Undo". The footer contains links for "About" and "Contact", and the page title "Project List".

At the very top of the screen you will see a Menu Bar. This permits you to perform various actions. Clicking on Home will always return you to the welcome screen. Clicking Log Out will log you out of PACT. Info is a dropdown menu and permits you see information about PACT (including help). If you are an administrator in PACT, you will also see an Admin dropdown menu that will permit you to perform various administrative functions. At the very end of the Menu Bar, you will see a dropdown item. The name of this item varies depending on which screen you are on. For the Projects List screen, it is called Projects. This menu provides access to function for each screen. This is useful if the items exceed the height of the window and you cannot see the buttons at the bottom of the screen. By using this menu, you do not have to scroll to the bottom of the screen to access various functions.

Below the *Menu Bar* you will see a *Breadcrumbs* bar. As you navigate through PACT you can return to previous screens by clicking a specific link in the *Breadcrumbs* bar.

You may filter which projects that you want to see in the project list. There are two methods to do this.

In the top left corner of any list you may will may a *Filter* selection:

Field: Value:

Select the **Field** you want to search for in the in the list then enter the **Value** for that field and click the **Filter** button. The list will only display items with the specified values.

In the top tight corner of any list of items you may will may a Search Box:

Search:

You may also enter a value in the **Search** box and press Enter. This will display only the items that have those values. The difference between the **Filter** choice is that filter can filter on data that may not be displayed in the List, for example **Access** in the Projects, but **Search** can only search for data that is displayed in the list.

In any list of items, you may see several icons    Show Edit Delete, after each item (depending on your access to that project). These permit you to view edit or delete the items, in the list.

Clicking the  button on any screen will undo the change that you made. For example, if you delete a Project and then decide that that was not correct decision you can click the **Undo** button and that Project will be restored. You click **Undo** as many times as you like. When there is nothing left to Undo then Undo will be disabled. Also, Undo will persist across sessions so you may Undo a change made in a previous session.

Clicking the  button on any screen will return you to the previous *logical* screen. This works similarly to the *breadcrumbs* at the top of the screen in that clicking a link in the list takes you back to a that particular screen. For example, if you are on the Project List screen clicking Back will take you to the Welcome screen. This is similar but not exactly the same as the back button in your browser (which is disabled in PACT).

In the **Navigation** column of each item in the project list you will see a series of links. This links will take you to the various components of the Project and will be discussed later.

1.2.1 PROJECT INTERFACE - NEW PROJECT

Upon initial use of the Project Interface, the Project Manager will set up the projects to be managed through Process and Artifact Compliance Tool. To add a project, click the **New Project** button below the **Project List**.

All Projects

New Project

Identifier

Name

Project Managers

Admin User
 Dave Newton
 Michelle Lange

Configuration Managers

Admin User
 Dave Newton
 Michelle Lange

Quality Assurance Members

Admin User
 Dave Newton
 Michelle Lange

Team Members

Admin User
 Dave Newton
 Michelle Lange

Designated AirWorthiness Representatives

Admin User
 Dave Newton
 Michelle Lange

Access

PUBLIC

Permitted Users

Admin User
 Dave Newton
 Michelle Lange
 Paul Carrick

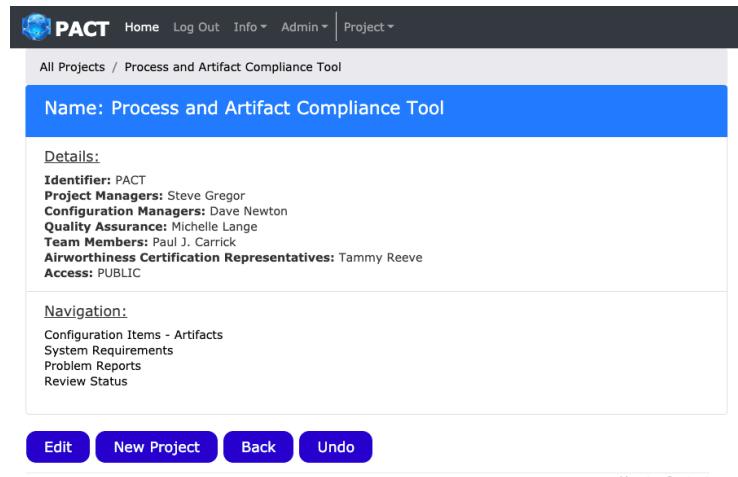
Create Project **New Project** **Back**

PROCESS AND ARTIFACT COMPLIANCE TOOL

Enter the Identifier and Name (these are required to be filled in). Optionally select the Project Managers (more than one name many be selected), Configuration Managers, Quality Assurance Managers, Team Members, and Designated Airworthiness Representatives. Next, choose the project Access. Project access can be Public, Private or Protected. Public access permits anyone in the organization to access the project. Private access only permits the project to be accessed by the creator. Protected access permits you to specify which users in the organization may access the project (even if they don't have a designated role). You can Select Create Project to create the project or Back to exit without saving the project.

1.2.2 PROJECT INTERFACE - VIEW PROJECT

From the **Project List**, Clicking the  icon for a specific Project will display the information for that specific project.



The screenshot shows the 'View Project' screen for the 'Process and Artifact Compliance Tool'. At the top, there's a search bar with a magnifying glass icon. Below it is a blue header bar with the project name 'Name: Process and Artifact Compliance Tool'. The main content area has a white background. It starts with a section titled 'Details:' containing project details: Identifier: PACT, Project Managers: Steve Gregor, Configuration Managers: Dave Newton, Quality Assurance: Michelle Lange, Team Members: Paul J. Carrick, Airworthiness Certification Representatives: Tammy Reeve, and Access: PUBLIC. Below this is a 'Navigation:' section with links to Configuration Items - Artifacts, System Requirements, Problem Reports, and Review Status. At the bottom, there are several buttons: 'Edit', 'New Project', 'Back', and 'Undo'. A footer at the very bottom contains 'About' and 'Contact' links.

View Project Screen

From the **Project List**, Clicking the  icon for a specific Project will permit you to edit that project.

From the **Project List**, Clicking the  icon for a specific Project will delete that project. Before deleting a Project, a confirmation dialog will appear asking if you are sure you want to delete the project.

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Are you sure?



1.2.3 PROJECT - CONFIGURATION ITEM - ARTIFACT (SEE SECTION 2 FOR FULL DETAILS)

Configuration Items provide a way to encapsulate and isolate logical or physical subsystems of a **Project**. Examples of why you might have more than one **Configuration Item** in a **Project** would be that the **Project** contains both hardware and software components, a **Project** contains multiple hardware items, or a software project has many different modules (not to be confused with files) or components.

In order for PACT to operate properly there should be at least one **Configuration Item** although there may be as many **Configuration Items** as desired. **Configuration items** are logically separate and so items in each Configuration Item do not need to be unique. Anything at the **Project** level (**System Requirements** or **Problem Reports**) will be shared among all the Configuration Items.

Artifacts under Configuration items are High Level Requirements (HLRs), Low Level Requirements (LLRs), Test Cases, Source Code Records, Requirement Tracing Matrices (RTMs), Documents and Reviews.

1.2.3.1 PROJECT- CONFIGURATION ITEM – NEW CONFIGURATION ITEM

After the Project has been created the next step would be to create a **Configuration Item**. The Project Manager or Configuration Manager will set up the configuration items to be managed. You can do this by clicking on **Configuration Items – Artifacts** in the Navigation Column of the Project List. This will take you to the Configuration Items List.

Name	Identifier	Type	Level	Navigation	Show	Edit	Delete
Processor Board #1	PB#1	1	B	HLRs LLRs Test Cases Source Codes RTM Documents Reviews	Show	Edit	Delete
Processor Board #2	PB#2	1	B	HLRs LLRs Test Cases Source Codes RTM Documents Reviews	Show	Edit	Delete

New Item Back Undo

To add a configuration item, click the **New Item** button below the **Configuration Items – Artifacts List**.

The screenshot shows the PACT application interface. At the top, there is a dark header bar with the PACT logo, navigation links for Home, Log Out, Info, Admin, and Item, and a breadcrumb trail indicating the current location: All Projects / Door and Slide Controller. The main title "New Item" is displayed prominently. Below the title are four input fields: "Name" (empty), "Type of Item" (empty dropdown menu), "Identifier" (empty text input), and "Design Assurance Level" (empty dropdown menu). At the bottom of the form are three buttons: "Create Item" (highlighted in blue), "New Item" (disabled, greyed out), and "Back". Below the form, a footer bar contains links for Process and Artifact Compliance Tool, About, Contact, and a green link labeled "Create Configuration Item Screen".

Enter the **Identifier** and **Name** (these are required to be filled in). Optionally, select the type of item. There are several types: DO-178, DO-254, DO-278, DO-160 or Other. This is the type of regulations that apply to the **Configuration Item**. If you don't see one that applies you can choose other or simple leave the choice blank. **Optionally**, select the Design Assurance Leve (DAL) that applies to this item. The choices are A-E, 1-4 or other. Again, if this does not apply to this item you can choose other or leave it blank. You can Select **Create Item** to create the Configuration Item or **Back** to exit without saving the Configuration Item.

1.2.4 PROJECT- SYSTEM REQUIREMENTS

System requirements permits you to manage the system level requirements of the Project.

1.2.4.1 PROJECT- SYSTEM REQUIREMENTS LIST

Clicking the **System Requirements** link in the Navigation Column of a specific Project will display the **System Requirements List**. From here you can add a new **System Requirement**, edit an existing **System Requirement**, mark a **System Requirement** as deleted, delete a **System Requirement**, export **System Requirements**, import **System Requirements**, or renumber **System Requirements**.

The screenshot shows the 'System Requirements' page of the PACT tool. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and System Requirements. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / System Requirements. The main title is 'System Requirements'. There are search and filter fields at the top right. The central part is a table with the following columns: Requirement ID, Requirement Description, Requirement Source, Safety Related?, Derived, Implementation, Image, Version, and several action buttons (Show, Edit, Mark As Deleted, Delete). The table contains five rows of data:

Requirement ID	Requirement Description	Requirement Source	Safety Related?	Derived	Implementation	Image	Version	Show	Edit	Mark As Deleted	Delete
SYS-001000	PACT SHALL provide an interface to manage Documents.		<input type="checkbox"/>	<input type="checkbox"/>			1				
SYS-002000	PACT SHALL provide an interface to manage Reviews.		<input type="checkbox"/>	<input type="checkbox"/>			1				
SYS-003000	PACT SHALL provide an interface to manage Requirements.		<input type="checkbox"/>	<input type="checkbox"/>			1				
SYS-004000	PACT SHALL provide Tracing for Requirements.		<input type="checkbox"/>	<input type="checkbox"/>			1				
SYS-005000	PACT SHALL provide an interface to manage Problem Reports.		<input type="checkbox"/>	<input type="checkbox"/>			1				

At the bottom, there are buttons for New System Requirement, Export, Import, Renumber, Back, and Undo. The footer includes links for Process and Artifact Compliance Tool, About, and Contact.

1.2.4.2 PROJECT- CREATING A NEW SYSTEM REQUIREMENT

Clicking the **New System Requirement** button from the System Requirements List permits you to create a new system requirement.

The screenshot shows the 'New System Requirement' page of the PACT tool. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and System Requirements. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / System Requirements. The main title is 'New System Requirement'. There are several input fields: 'Requirement ID' (empty), 'Description' (with a rich text editor toolbar containing buttons for bold, italic, underline, etc.), 'Category' (empty), 'Verification method' (list: Inspection, Simulation, Demonstration), 'Source' (empty), 'Safety Related?' (checkbox, unchecked), 'Derived' (checkbox, unchecked), 'Derived justification' (empty text area), 'Implementation' (empty text area), and an 'Upload Image:' field with a 'Choose File' button and a note 'No file chosen'. At the bottom are three buttons: 'Save System Requirement', 'New System Requirement', and 'Back'.

New System Requirements Screen

Enter the Requirement ID (this is required to be filled in and must be unique; all other fields are optional). Enter a description for this System Requirement. If you wish you may enter a category for this system requirement. You may select one or more verification methods. You also may enter the source of the requirement. If this System Requirement is safety related click the **Safety Related** checkbox. If this System Requirement is Derived click the Derived checkbox. If you click the Derived checkbox you must enter the reason the System Requirement is derived in Derived Justification. If you wish you may enter an implementation for this system requirement. You may also choose a graphic file on your computer (gif, png or jpeg; this should be no larger than 40x40 pixels) to be displayed in the System Requirement List for the System Requirement.

If you are editing a System Requirement and wish to remove the image, click the Remove Image checkbox. You can Select [Save System Requirement](#) to create the System Requirement or [Back](#) to exit without saving the System Requirement.

1.2.4.3 PROJECT- EDITING A SYSTEM REQUIREMENT

To edit a **System Requirement**, from the **System Requirements List**, click the  icon for a specific **System Requirement** or choose the  button from the **System Requirement View Screen**. Editing a **System Requirement** is identical to creating a new **System Requirement** and all the fields are the same.

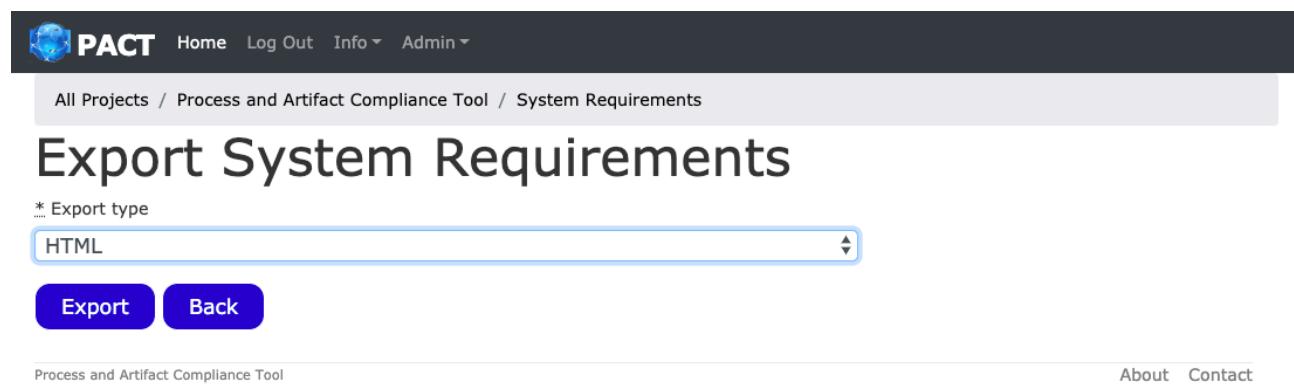
1.2.4.4 PROJECT- VIEWING A SYSTEM REQUIREMENT

To view a System Requirement, from the System Requirements List, click the  icon for a specific System Requirement or choose the  button from the System Requirement Edit Screen.

1.2.4.5 PROJECT- EXPORTING SYSTEM REQUIREMENTS

Exporting **System Requirements** permits you to save the **System Requirements** for a **Project** to a file that can be imported into another application. You can export **System Requirements** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export System Requirements, from the System Requirements List, click the  button.



Choose the type of export you would like (HTML, PDF, CSV or XML) and click the  button. The file will then download to your computer.

1.2.4.6 PROJECT- IMPORTING SYSTEM REQUIREMENTS

Importing **System Requirements** permits you to load the **System Requirements** for a **Project** from another application. You can import **System Requirements** from a Comma Separated Value (CSV) file or Excel File (XLS or XLSX).

The file should only contain data (**no headers or extraneous entries**) with lines in the format of:

Requirement_Number,Requirement_ID,Description,Category,Verification_Method,Source,Safety,Implementation,Version

To import System Requirements, from the System Requirements List, click the **Import** button.

Import System Requirements Screen

Choose the file you would like to import. Click **Duplicates permitted** if you want to permit duplicate IDs to be imported. If you do not check **Duplicates permitted** and a **System Requirement** already exists with the same ID as in the file when the file is imported, it will cause an error and the file will not be imported.

1.2.4.7 PROJECT- RENUMBERING SYSTEM REQUIREMENTS

Renumbering **System Requirements** permits renumbering the system requirements starting at one and incrementing by one. To renumber **System Requirements**, click **Renumber** from the **System Requirements** list.

1.2.4.8 PROJECT- DELETING SYSTEM REQUIREMENTS

From the **System Requirements**, Clicking the or icons for a specific **System Requirement** will delete that **System Requirement**. Before deleting a **System Requirement**, a confirmation dialog will appear asking if you are sure you want to delete the **System Requirement**.

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Are you sure?



The difference between **Mark as Deleted** and **Delete** is that **Mark as Deleted** will leave the

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system requirement but empty its contents replacing it with deleted. This permits you to maintain a record that the **System Requirement** existed at one time but was deleted. **Delete** will remove any trace of the **System Requirement**.

1.3 PROJECT- PROBLEM REPORTS OVERVIEW

Problem Reports permits you to record various reports of problems within the system and their resolution.

1.3.1 PROJECT- THE PROBLEM REPORTS LIST

The **Problem Reports List** is accessed through the **Navigation** column of a particular Project or through the **Navigation** section of the **Project View Screen**.

The screenshot shows the 'Problem Reports' page of the PACT application. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and Problem Reports. Below the navigation bar, a breadcrumb trail shows 'All Projects / Process and Artifact Compliance Tool / Problem Reports'. The main title is 'Problem Reports'. On the right, there is a search bar labeled 'Search:' with a placeholder 'Search...'. Below the title, there is a table with a single row containing a single report entry. The table columns are: Problem Report ID, Title, Description, Opened By, Assigned To, Status, Safety, Criticality, Datemod, History, and three action buttons (Show, Edit, Delete). The report entry details are: ID 1, Title 'Review Attachment Index Duplicates View', Description (empty), Opened By 'Paul J. Carrick', Assigned To 'Paul J. Carrick', Status 'Assigned', Safety 'Type 0', Criticality '0', Datemod '2019-10-30 11:06AM PDT', and History 'History'. At the bottom of the page, there are several buttons: New Problem Report, All Problem Reports, My Problem Reports, PRs Assigned to Me, Open Problem Reports, Back, and Undo. The footer contains links for About and Contact, and a note: 'Process and Artifact Compliance Tool'.

Problem Report ID	Title	Description	Opened By	Assigned To	Status	Safety	Criticality	Datemod	History	Show	Edit	Delete
1	Review Attachment Index Duplicates View Edit Delete		Paul J. Carrick	Paul J. Carrick	Assigned	<input type="checkbox"/>	Type 0	2019-10-30 11:06AM PDT	History			

Problem Reports List

1.3.2 PROJECT- NEW PROBLEM REPORT

Clicking the **Create Problem report** button from the Problem Reports List permits you to create a new problem report.

The screenshot shows the 'New Problem Report' form within the PACT application. The top navigation bar includes links for Home, Log Out, Info, Admin, and Problem Report. The current page path is All Projects / Process and Artifact Compliance Tool / Problem Reports. The main form fields include:

- Problem Report ID:** A text input field containing the value '4'.
- Date Opened:** A date and time picker set to 2020-02-14T07:56:56.
- Opened By:** A dropdown menu showing 'Paul Carrick'.
- Assigned To:** A dropdown menu showing 'Paul Carrick'.
- Status:** A dropdown menu showing 'Open'.
- Date Modified:** A date and time picker set to 2020-02-14T07:56:56.
- Title:** An empty text input field.
- Product:** An empty text input field.
- Criticality:** An empty dropdown menu.
- Source:** A dropdown menu showing 'Internal'.
- Discipline Assigned:** A dropdown menu showing 'Engineering'.
- Target Date:** A date and time picker set to 2020-02-14T07:56:56.
- Close Date:** A date and time picker set to 2020-02-14T07:56:56.
- Description:** An empty text input field.
- Found In:** An empty text input field.
- Corrective Action:** An empty text input field.
- Fixed In:** An empty text input field.
- Verification:** An empty text input field.
- Feedback:** An empty text input field.
- Notes:** An empty text input field.
- Meeting ID:** An empty text input field.
- Safety Related:** A checked checkbox.

At the bottom of the form are buttons for **Create Problem report**, **New Problem Report**, **Back**, and **Undo**.

New Problem Report Screen

Enter the Problem Report ID (this is required to be filled in and must be unique; all other fields are optional). Enter the date that the problem report was opened (this defaults to today). Choose the user that opened the problem report (this defaults to the current user). Choose the user that the problem report is assigned to (this defaults to the current user). The assigned user will receive an email with the problem report. The status is always Open for a new problem report and cannot be changed. You may change the date modified if you choose. It is recommended that you enter a title for the problem report. You may enter a Product that the problem report refers to. You may choose the criticality for the problem report (Type 0, Type 1A, Type 1B, Type 2, Type 3A, Type 3B or leave it blank). You may choose the Source (Internal, Custom, Cert Authority or Other). You may enter the Discipline Assigned (Engineering, Manufacturing, Quality or Other). Enter the target date that the problem should be resolved by (this defaults to today). Enter the date that the problem should be resolved by (this defaults to today). Enter the date that the problem report was closed (this defaults to today). You may enter a description for this Problem Report. You may enter a where the Problem Report was found. Enter any corrective actions for the problem report. You may enter the Revision that the problem report was fixed in. You may enter the verification method that was used to verify that the problem report was fixed. You may also enter any feedback regarding the problem report. You may also enter any notes regarding the problem report. You may also enter a meeting ID if the Problem report was discussed in a meeting. Check the Safety Related if the Problem Report is safety related. You can Select  to create the Problem Report or  to exit without saving the Problem Report.

1.3.3 PROJECT- EDITING A PROBLEM REPORT

To edit a **Problem Report**, from the **Problem Reports List**, click the  icon for a specific **Problem Report** or choose the  button from the **Problem Report View Screen**. Editing a **Problem Report** is identical to creating a new **Problem Reports** and all the fields are the same.

1.3.4 PROJECT- VIEWING A PROBLEM REPORT

To view a **Problem Report**, from the **Problem Reports List**, click the  icon for a specific **Problem Report** or choose the  button from the **Problem Report Edit Screen**.

1.3.5 PROJECT- ALL PROBLEM REPORTS

To view all **Problem Reports**, from the **Problem Reports List**, click the  button. This permits you to view all PRs after you have filtered the list of PRs.

1.3.6 PROJECT- MY PROBLEM REPORTS

To view all **Problem Reports** you have created, from the **Problem Reports List**, click the  button.

1.3.7 PROJECT - PRs ASSIGNED TO ME

To view all **Problem Reports** assigned to you, from the **Problem Reports List**, click the **PRs Assigned to Me** button.

1.3.8 PROJECT- OPEN PROJECT REPORTS

To view all open **Problem Reports**, from the **Problem Reports List**, click the **Open Problem Reports** button.

1.3.9 PROJECT- PROBLEM REPORTS - HISTORY OVERVIEW

Every time a **Problem Report** changes the changes are recorded so you may see how a **Problem Report** was changed.

1.3.9.1 PROJECT- PROBLEM REPORTS - HISTORY LIST

To view the history for a specific **Problem Report**, from the **Problem Reports List**, click the **History** link in the History column for the **Problem Report** you want the history for.

Action	Modified By	Status	Severity Type	DateMod	Show	Edit	Delete
	steve@patmos-eng.com	Open		2020-01-14 11:02AM PST			
	paul@patmos-eng.com	Open		2020-01-14 11:02AM PST			
	paul@patmos-eng.com	Open		2020-01-14 11:02AM PST			
	paul@patmos-eng.com	Assigned		2020-01-14 11:02AM PST			
	paul@patmos-eng.com	Implemented		2020-01-14 11:02AM PST			
	steve@patmos-eng.com	Implemented		2020-01-14 11:02AM PST			
	paul@patmos-eng.com	Verified		2020-01-14 11:02AM PST			

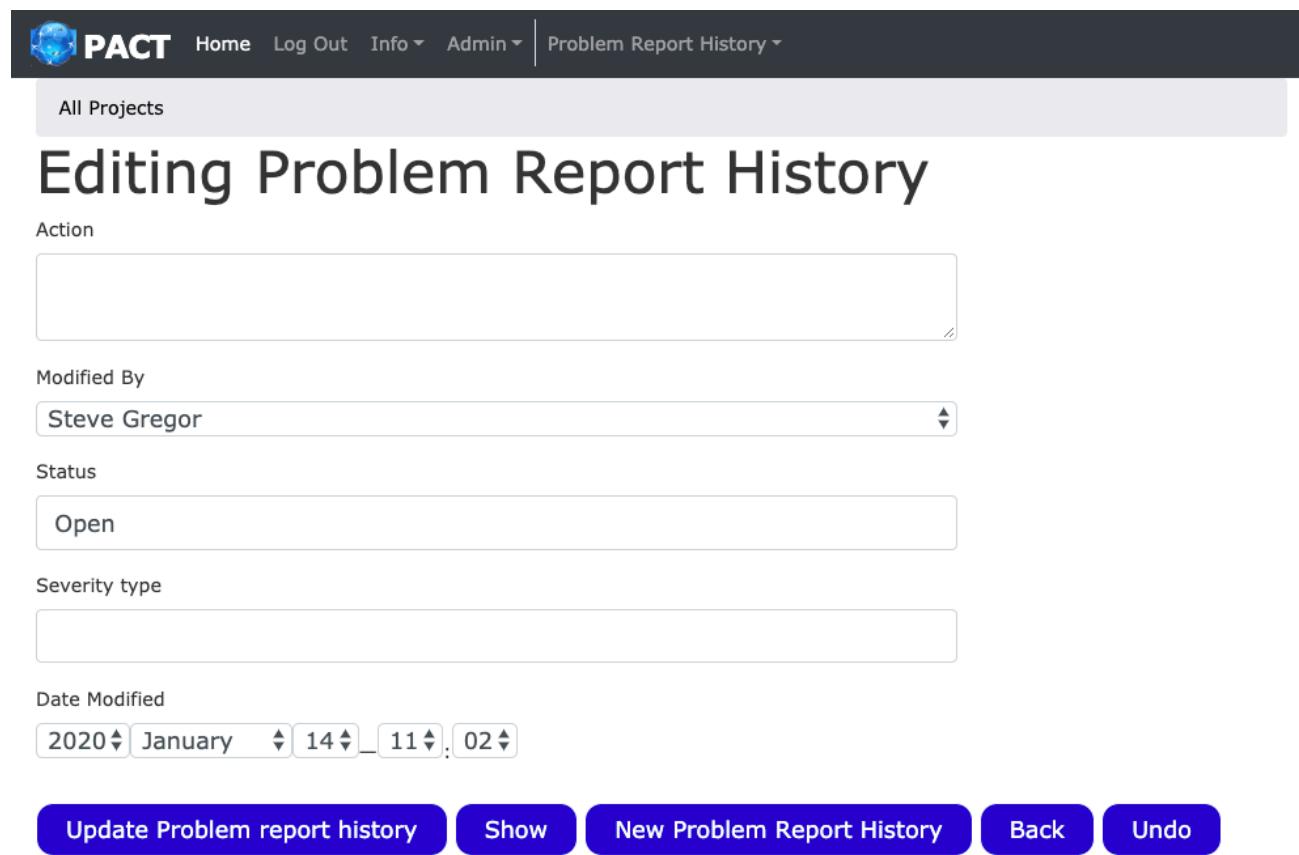
New Problem Report History Back to Problem Report Undo

From the **Problem Report History List**, you may create **Problem Reports**, edit **Problem Reports** or delete **Problem Reports**.

In the **Problem Report History List**, you may see several icons   after each **Problem Report History** (depending on your access to that project).

1.3.9.2 PROJECT- PROBLEM REPORTS - HISTORY – EDIT PROBLEM HISTORY

From the **Problem Report History List**, Clicking the  icon for a specific **Problem Report History** will permit you to edit the information for that specific **Problem Report History**.



The screenshot shows the 'Editing Problem Report History' page of the PACT application. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and Problem Report History. Below the navigation bar, there is a section titled 'All Projects'. The main content area has the title 'Editing Problem Report History'. There are several input fields: 'Action' (a large text area), 'Modified By' (a dropdown menu showing 'Steve Gregor'), 'Status' (a dropdown menu showing 'Open'), 'Severity type' (a large text area), and 'Date Modified' (a date and time picker showing '2020-01-14 02:00'). At the bottom, there are several buttons: 'Update Problem report history' (highlighted in blue), 'Show', 'New Problem Report History', 'Back', and 'Undo'.

You may edit the **Action**, **Modified By**, **Status**, **Severity**, **Type** and **Date Modified** Fields and then click  to save the changes or  to cancel.

1.3.9.3 PROJECT- PROBLEM REPORTS - HISTORY – DELETE PROBLEM HISTORY

From the **Problem Report History List**, Clicking the  icon for a specific **Problem Report History** will delete that **Problem Report History**. Before deleting a **Problem Report History**, a confirmation dialog will appear asking if you are sure you want to delete the **Problem Report History**.

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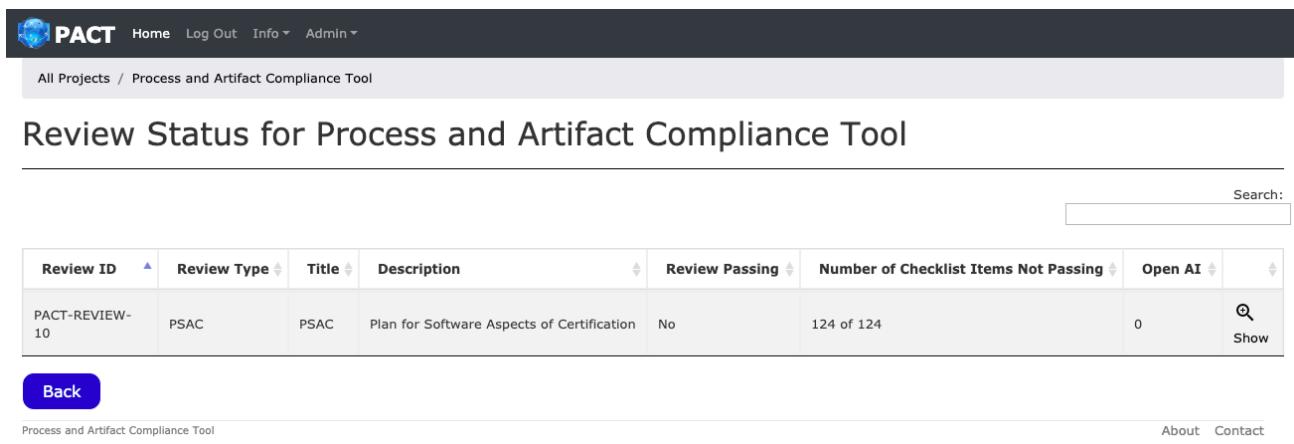
Are you sure?

[Cancel](#)

[OK](#)

1.4 PROJECT- REVIEW STATUS

Review Status permits you to see the progress of the various reviews for the system.



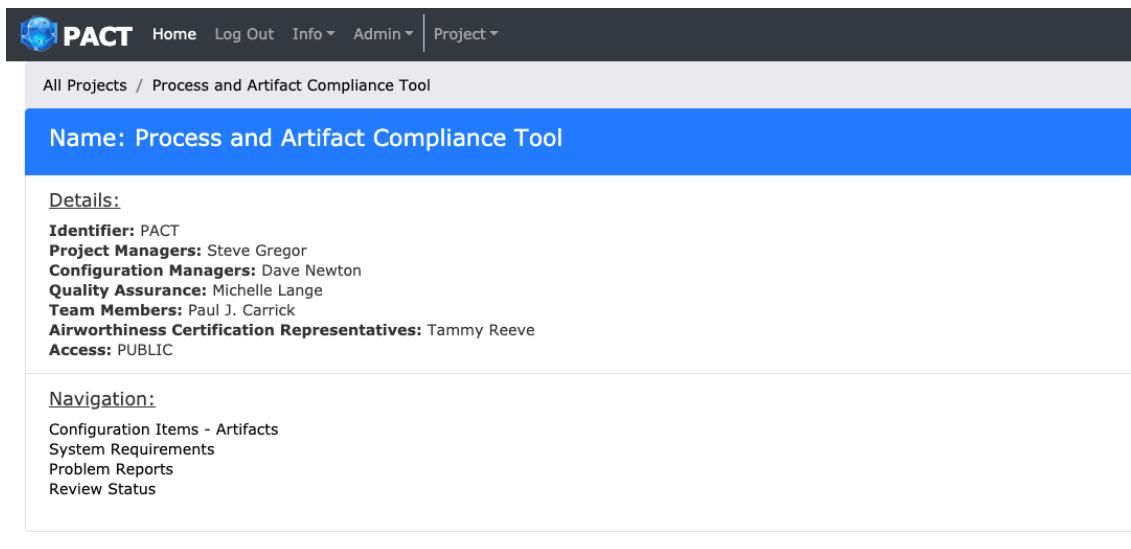
The screenshot shows the 'Review Status for Process and Artifact Compliance Tool' page. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and a search bar labeled 'Search:'. Below the navigation is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool. The main content area displays a table with one row of data:

Review ID	Review Type	Title	Description	Review Passing	Number of Checklist Items Not Passing	Open AI	Show
PACT-REVIEW-1.0	PSAC	PSAC	Plan for Software Aspects of Certification	No	124 of 124	0	

Below the table, there is a 'Back' button and a footer with links for About and Contact.

Review Status List

From the **Review Status List**, Clicking the icon for a specific review will display the information for that specific review.



The screenshot shows the 'Name: Process and Artifact Compliance Tool' page. The page has a blue header bar with the project name. Below the header, there are two sections: 'Details:' and 'Navigation:'. The 'Details:' section contains the following information:

- Identifier:** PACT
- Project Managers:** Steve Gregor
- Configuration Managers:** Dave Newton
- Quality Assurance:** Michelle Lange
- Team Members:** Paul J. Carrick
- Airworthiness Certification Representatives:** Tammy Reeve
- Access:** PUBLIC

The 'Navigation:' section lists links to Configuration Items - Artifacts, System Requirements, Problem Reports, and Review Status.

At the bottom of the page are buttons for Edit, New Project, Back, and Undo.

Review Status

Section 2: CONFIGURATION ITEM - ARTIFACTS INTERFACE

2.1 CONFIGURATION ITEM - ARTIFACTS INTERFACE Overview

Configuration Items provide a way to encapsulate and isolate logical or physical subsystems of a **Project**. Examples of why you might have more than one **Configuration Item** in a **Project** would be that the **Project** contains both hardware and software components, a **Project** contains multiple hardware items, or a software project has many different modules (not to be confused with files) or components.

In order for PACT to operate properly there should be at least one **Configuration Item** although there may be as many **Configuration Items** as desired. **Configuration items** are logically separate and so items in each Configuration Item do not need to be unique. Anything at the **Project** level (**System Requirements** or **Problem Reports**) will be shared among all the Configuration Items.

Artifacts under Configuration items are High Level Requirements (HLRs), Low Level Requirements (LLRs), Test Cases, Source Code Records, Requirement Tracing Matrices (RTMs), Documents and Reviews.

2.2 THE CONFIGURATION ITEM LIST

The **Configuration Items – Artifacts List** is accessed through the **Navigation** column of a particular project or through the **Navigation** section of the **Project View Screen**.

Name	Identifier	Type	Level	Navigation				
Processor Board #1	PB#1	1	B	HLRs LLRs Test Cases Source Codes RTM Documents Reviews	Show	Edit	Delete	
Processor Board #2	PB#2	1	B	HLRs LLRs Test Cases Source Codes RTM Documents Reviews	Show	Edit	Delete	

In the Navigation column of each item in the **Configuration Items List** you will see a series of links. These links will take you to the various components of the **Configuration Items** and will be discussed later.

2.3 CREATING A NEW CONFIGURATION ITEM

To add a configuration item, click the **New Item** button below the **Configuration Items – Artifacts List**.

The screenshot shows the PACT web application interface. At the top, there is a dark header bar with the PACT logo, navigation links for Home, Log Out, Info, Admin, and Item, and a breadcrumb trail indicating the current location: All Projects / Door and Slide Controller. The main content area is titled "New Item". It contains four input fields: "Name" (empty), "Type of Item" (empty with a dropdown arrow), "Identifier" (empty), and "Design Assurance Level" (empty with a dropdown arrow). Below these fields are three buttons: "Create Item" (highlighted in blue), "New Item", and "Back". At the bottom of the page, there is a footer with links for Process and Artifact Compliance Tool, About, Contact, and a green link labeled "Create Configuration Item Screen".

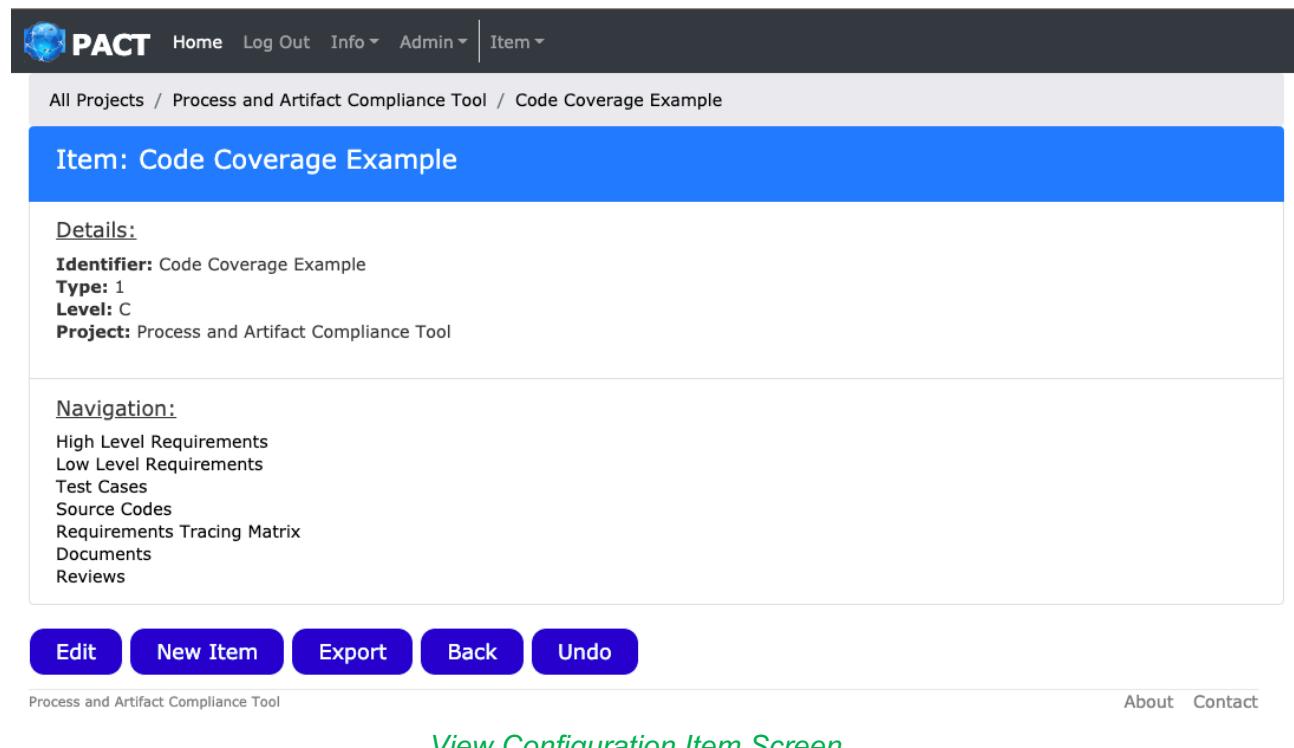
Enter the **Identifier** and **Name** (these are required to be filled in). Optionally, select the type of item. There are several types: DO-178, DO-254, DO-278, DO-160 or Other. This is the type of regulations that apply to the **Configuration Item**. If you don't see one that applies you can choose other or simply leave the choice blank. **Optionally**, select the Design Assurance Level (DAL) that applies to this item. The choices are A-E, 1-4 or other. Again, if this does not apply to this item you can choose other or leave it blank. You can Select **Create Item** to create the Configuration Item or **Back** to exit without saving the Configuration Item.

2.4 EDITING A CONFIGURATION ITEM

To edit a **Configuration Item**, from the **Configuration Items – Artifacts List**, click the  icon for a specific **Configuration Item** or choose the  button from the **Configuration Item** view screen. Editing a Configuration Item is identical to creating a new Configuration item and all the fields are the same.

2.5 VIEWING A CONFIGURATION ITEM

To view a **Configuration Item**, from the **Configuration Items – Artifacts List**, click the  icon for a specific **Configuration Item** or choose the  button from the **Configuration Item** edit screen.



The screenshot shows the PACT application interface. At the top, there is a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and Item dropdown menus. Below the navigation bar, the URL path is shown as All Projects / Process and Artifact Compliance Tool / Code Coverage Example. The main content area has a blue header bar with the text "Item: Code Coverage Example". Underneath, there is a section titled "Details:" containing the following information:

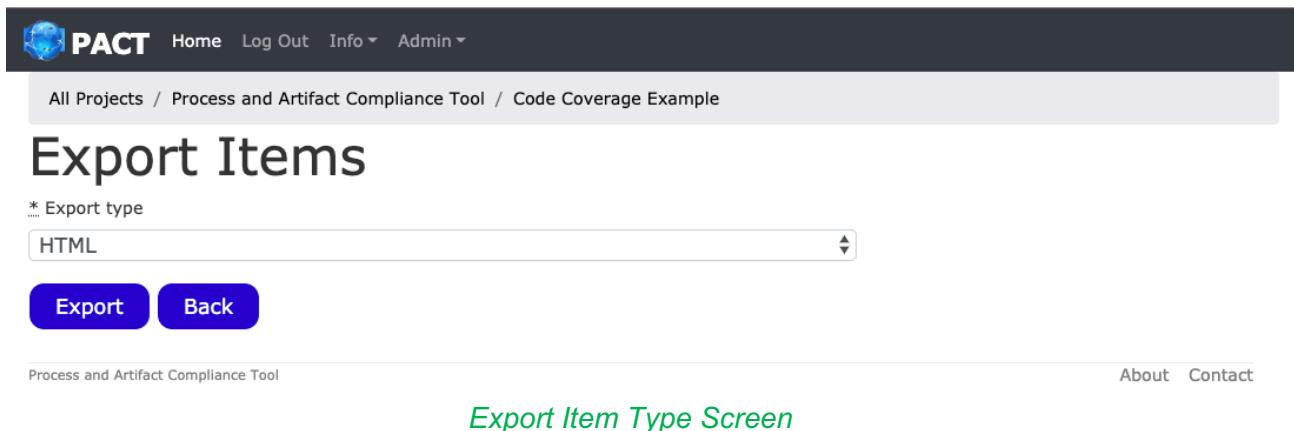
- Identifier:** Code Coverage Example
- Type:** 1
- Level:** C
- Project:** Process and Artifact Compliance Tool

Below the details, there is a "Navigation:" section with links to High Level Requirements, Low Level Requirements, Test Cases, Source Codes, Requirements Tracing Matrix, Documents, and Reviews. At the bottom of the page, there are several buttons: Edit, New Item, Export, Back, and Undo. On the far right, there are links for About and Contact. The text "View Configuration Item Screen" is displayed in green at the bottom center of the page.

2.6 EXPORTING A CONFIGURATION ITEM

Exporting a Configuration Item permits you to save the **High Level Requirements** (HLRs), **Low Level Requirements** (LLRs), **Test Cases** and **Source Code Records** for a **Configuration Item** to a file that can be imported into another application. These include associated **System Requirements** as well. You can export a **Configuration Item** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export a Configuration Item, from the Configuration Items – Artifacts List, click the  **Show** icon for a specific **Configuration Item** or choose the **Show** button from the **Configuration Item** edit screen to get to the **View Configuration Item** screen. Next click the  **Export** button.



All Projects / Process and Artifact Compliance Tool / Code Coverage Example

Export Items

* Export type

HTML

Export Back

About Contact

Export Item Type Screen

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the  **Export** button. The file will then download to your computer.

2.7 CONFIGURATION ITEM - NAVIGATION

Navigation	<u>Navigation:</u>
HLRs	High Level Requirements
LLRs	Low Level Requirements
Test Cases	Test Cases
Source Codes	Source Codes
RTM	Requirements Tracing Matrix
Documents	Documents
Reviews	Reviews

Configuration Item Navigation

Configuration Item Navigation can be access from the **Navigation** column of a specific **Configuration Item** in the **Configuration Items List** or from the **Configuration Item View Screen**. This permits you to access **High Level Requirements**, **Low Level Requirements**, **Test Cases**, **Source Codes**, the **Requirements Tracing Matrix**, **Documents** or **Reviews**.

2.7.1 CONFIGURATION ITEM- HIGH LEVEL REQUIREMENTS

High Level requirements permits you to manage the high level requirements of the Configuration Item.

2.7.1.1 CONFIGURATION ITEM - HIGH LEVEL REQUIREMENTS LIST

Clicking the **High Level Requirements** or **HLRs** link in the **Configuration Item Navigation** will display the **High Level Requirements List**. From here you can add a new **High Level Requirement**, edit an existing **High Level Requirement**, mark a **High Level Requirement** as deleted, delete a **High Level Requirement**, export **High Level Requirements**, import **High Level Requirements**, or renumber **High Level Requirements**.

Requirement ID	Description	Category	Safety	Robustness	Derived	System Requirements	Test Method	Image	Version	Show	Edit	Mark As Deleted	Delete
HLR-002004	PACT SHALL provide an interface to create sign-in sheets for Review members.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SYS-002000			6				
HLR-002005	PACT SHALL support the concept of Baselining, such that any subsequent changes to reviews automatically increments the version number.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SYS-002000			6				
HLR-002006	PACT SHALL tailor the Review types according to what is required by the DO-178 <i>C</i>) DAL and permit the use of optional Review types if desired by the user. Design Note: Lockdown required aspects to ensure they don't remove needed checklist review items for compliance. Changes to templates would primarily be additions, not deletions to ensure compliance.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SYS-002000			6				
HLR-002007	PACT SHALL tailor the Review types according to what is required by the selected DO-178 <i>C</i>) supplements. Design Note: Lockdown required aspects to ensure they don't remove needed checklist review items for compliance. Changes to templates would primarily be additions, not deletions to ensure compliance.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SYS-002000			6				
HLR-002008	PACT SHALL provide the user with an option to attach a file when the review is first created.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				1				
HLR-003000	PACT SHALL support the following types of requirements: <ul style="list-style-type: none">• System Requirements• High-Level Requirements		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SYS-003000			6				
HLR-003001	PACT SHALL support the following fields for a System Requirement: <ul style="list-style-type: none">• Requirement ID• Requirement Description		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	sys-003000			6				

New High Level Requirement Export Import Renumber Back Undo

About Contact

High Level Requirements List

2.7.1.2 CONFIGURATION ITEM - CREATING A NEW HIGH LEVEL REQUIREMENT

Clicking the **New System Requirement** button from the High Level Requirements List permits you to create a new High Level requirement.

The screenshot shows the 'New High Level Requirement' page. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and High Level Requirement. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / Configuration Items - Artifacts / Process and Artifact Compliance Tool / High Level Requirements. The main area has a title 'New High Level Requirement'. It contains several input fields: 'Requirement ID' (empty text box), 'Description' (rich text editor toolbar with buttons for bold, italic, underline, etc.), 'Category' (empty text box), 'Verification method' (dropdown menu showing 'Inspection', 'Simulation', 'Demonstration'), 'Safety Related?' (checkbox checked), 'Robustness?' (checkbox uncheckable), 'Derived?' (checkbox uncheckable), 'Derived justification' (empty text box), 'Test Method' (empty text box), and a file upload field ('Choose File' button, 'No file chosen'). There's also a 'Remove Image?' checkbox. At the bottom are three buttons: 'Save High Level Requirement' (highlighted in blue), 'New High Level Requirement', and 'Back'.

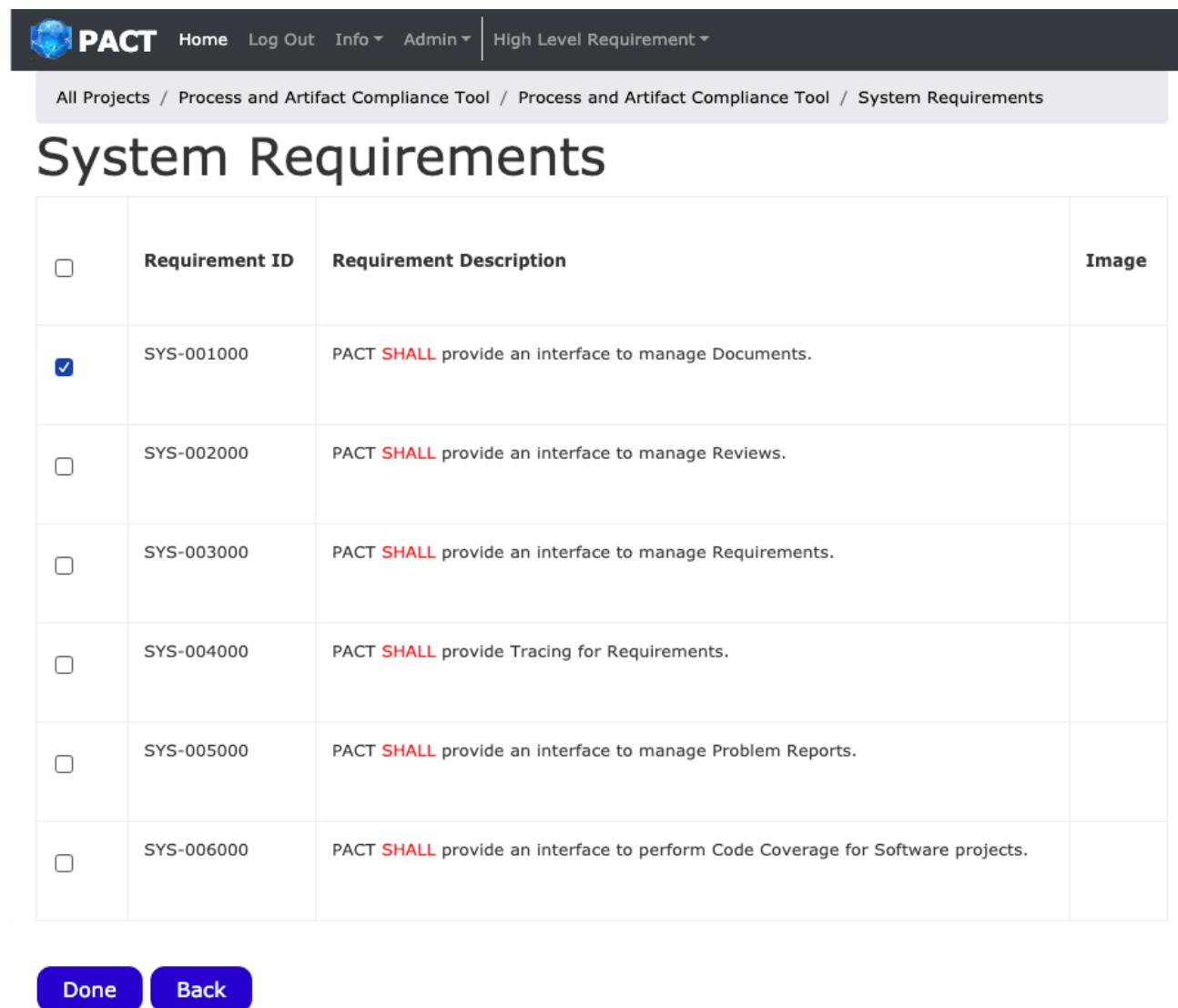
Enter the Requirement ID (this is required to be filled in and must be unique; all other fields are optional). Enter a description for this High Level Requirement. If you wish you may enter a category for this high level requirement. You may select one or more verification methods. If this High Level Requirement is safety related click the Safety Related checkbox. If the High Level Requirement is related to Robustness click the **Robustness** Checkbox. If this High Level Requirement is Derived click the Derived checkbox. If you click the Derived checkbox you must enter the reason the High Level Requirement is derived in Derived Justification. If you wish you may enter a test method for this high level requirement. You may also choose a graphic file on your computer (gif, png or jpeg; this should be no larger than 40x40 pixels) to be displayed in the High Level Requirement List for the High Level Requirement. If you are editing a High Level Requirement and wish to remove the image, click the Remove Image checkbox. You can Select **Save High Level Requirement** to create the High Level Requirement or **Back** to exit without saving the High Level Requirement.

2.7.1.3 CONFIGURATION ITEM - EDITING A HIGH LEVEL REQUIREMENT

To edit a High Level Requirement, from the High Level Requirements List, click the  icon for a specific High Level Requirement or choose the  button from the High Level Requirement View Screen. Editing a High Level Requirement is identical to creating a new High Level Requirement and all the fields are the same.

2.7.1.4 CONFIGURATION ITEM – LINKING HIGH LEVEL REQUIREMENTS TO SYSTEM REQUIREMENTS

When editing a **High Level Requirement**, you have the option to link the **High Level Requirement** to one or more **System Requirements**. To do this click the  button.



The screenshot shows the 'System Requirements' page of the PACT application. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and High Level Requirement. Below the navigation bar, a breadcrumb trail shows All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool / System Requirements. The main title is 'System Requirements'. Below the title is a table with the following columns: a checkbox column, a 'Requirement ID' column, a 'Requirement Description' column, and an 'Image' column (which is currently empty). There are seven rows in the table, each representing a system requirement:

<input type="checkbox"/>	Requirement ID	Requirement Description	Image
<input checked="" type="checkbox"/>	SYS-001000	PACT SHALL provide an interface to manage Documents.	
<input type="checkbox"/>	SYS-002000	PACT SHALL provide an interface to manage Reviews.	
<input type="checkbox"/>	SYS-003000	PACT SHALL provide an interface to manage Requirements.	
<input type="checkbox"/>	SYS-004000	PACT SHALL provide Tracing for Requirements.	
<input type="checkbox"/>	SYS-005000	PACT SHALL provide an interface to manage Problem Reports.	
<input type="checkbox"/>	SYS-006000	PACT SHALL provide an interface to perform Code Coverage for Software projects.	

At the bottom of the page are two buttons: 'Done' and 'Back'.

You may click the checkbox before one or more **System Requirements**. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking [Done](#) will link the **High Level Requirement** to the **System requirement(s)**. [Back](#) will return without making any changes.

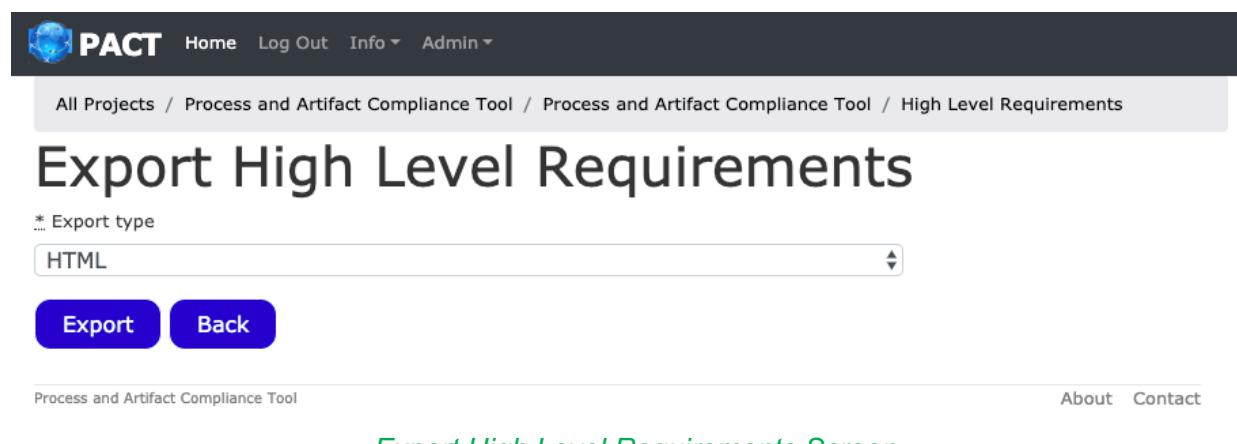
2.7.1.5 CONFIGURATION ITEM - VIEWING A HIGH LEVEL REQUIREMENT

To view a High Level Requirement, from the High Level Requirements List, click the  icon for a specific High Level Requirement or choose the [Show](#) button from the High Level Requirement Edit Screen.

2.7.1.6 CONFIGURATION ITEM - EXPORTING HIGH LEVEL REQUIREMENTS

Exporting **High Level Requirements** permits you to save the **High Level Requirements** for a **Configuration Item** to a file that can be imported into another application. You can export **High Level Requirements** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export High Level Requirements, from the High Level Requirements List, click the [Export](#) button.



The screenshot shows the 'Export High Level Requirements' page. At the top, there's a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and a search icon. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool / High Level Requirements. The main title is 'Export High Level Requirements'. Below it, there's a dropdown labeled 'Export type' set to 'HTML'. At the bottom of the form area are two buttons: 'Export' (highlighted in blue) and 'Back'. At the very bottom of the page, there's a footer with links for About and Contact, and the text 'Export High Level Requirements Screen'.

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the [Export](#) button. The file will then download to your computer.

2.7.1.7 CONFIGURATION ITEM - IMPORTING HIGH LEVEL REQUIREMENTS

Importing **High Level Requirements** permits you to load the **High Level Requirements** for a **Configuration Item** from another application. You can import **High Level Requirements** from a Comma Separated Value (CSV) file or Excel File (XLS or XLSX).

The file should only contain data (**no headers or extraneous entries**) with lines in the format of:

```
Requirement_Number,Requirement_ID,Description,Category,Verification_Method,test_method,derived,derived_justification,safety,robustness,Version,system_requirement_associations
```

To import High Level Requirements, from the High Level Requirements List, click the **Import** button.

The screenshot shows the 'Import High Level Requirements' page. At the top, there's a navigation bar with the PACT logo, Home, Log Out, Info, and Admin options. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool. The main title is 'Import High Level Requirements'. Below the title is a file input field with 'Choose File' and 'No file chosen' placeholder text. There are two checkboxes: 'Duplicates permitted' and 'Association changes permitted'. At the bottom are two buttons: 'Load High Level Requirements' (highlighted in blue) and 'Back'.

Import High Level Requirements Screen

Choose the file you would like to import. Click **Duplicates permitted** if you want to permit duplicate IDs to be imported. If you do not check **Duplicates permitted** and a **High Level Requirement** already exists with the same ID as in the file when the file is imported, it will cause an error and the file will not be imported. Click **Association changes permitted** if you want to permit changes to **System Requirement** associations. If you do not check **Association changes permitted** and a **High Level Requirement** already exists with the same ID as in the file when the file is imported and it changes the **System Requirement** associations, it will cause an error and the file will not be imported.

2.7.1.8 CONFIGURATION ITEM - RENUMBERING HIGH LEVEL REQUIREMENTS

Renumbering **High Level Requirements** permits renumbering the high level requirements starting at one and incrementing by one. To renumber **High Level Requirements**, click **Renumber** from the **High Level Requirements** list.

2.7.1.9 CONFIGURATION ITEM - DELETING HIGH LEVEL REQUIREMENTS

From the **High Level Requirements**, Clicking the or icons for a specific **High Level Requirement** will delete that **High Level Requirement**. Before deleting a **High Level Requirement**, a confirmation dialog will appear asking if you are sure you want to delete the **High Level Requirement**.

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Are you sure?



The difference between **Mark as Deleted** and **Delete** is that **Mark as Deleted** will leave the high level requirement but empty its contents replacing it with deleted. This permits you to maintain a record that the **High Level Requirement** existed at one time but was deleted. **Delete** will remove any trace of the **High Level Requirement**.

2.7.2 CONFIGURATION ITEM- LOW LEVEL REQUIREMENTS

Low Level requirements permits you to manage the low level requirements of the Configuration Item.

2.7.2.1 CONFIGURATION ITEM - LOW LEVEL REQUIREMENTS LIST

Clicking the **LLRs** link in the Navigation Column of a specific Configuration Item will display the **Low Level Requirements List**. From here you can add a new **Low Level Requirement**, edit an existing **Low Level Requirement**, mark a **Low Level Requirement** as deleted, delete a **Low Level Requirement**, export **Low Level Requirements**, import **Low Level Requirements**, or renumber **Low Level Requirements**.

Requirement ID	Description	Safety Related	Derived	High Level Requirements	Version				
LLR-003000	PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	<input type="checkbox"/>	<input type="checkbox"/>	HLR-003002	8				
LLR-003001	PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	<input type="checkbox"/>	<input type="checkbox"/>	HLR-003002	9				
LLR-003002	PACT SHALL throw an error if the associations from an import would change the existing associations.	<input type="checkbox"/>	<input type="checkbox"/>	HLR-003002	8				
LLR-003003	PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	<input type="checkbox"/>	<input type="checkbox"/>	HLR-003004	7				
LLR-003004	PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	<input type="checkbox"/>	<input type="checkbox"/>	HLR-003004	7				

New Low Level Requirement Export Import Renumber Back Undo

About Contact

Low Level Requirements List

2.7.2.2 CONFIGURATION ITEM - CREATING A NEW LOW LEVEL REQUIREMENT

Clicking the **New System Requirement** button from the Low Level Requirements List permits you to create a new Low Level requirement.

The screenshot shows the 'New Low Level Requirement' form. At the top, there's a navigation bar with links like Home, Log Out, Info, Admin, and the current page title. Below that is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / Configuration Items - Artifacts / Process and Artifact Compliance Tool / Low Level Requirements. The main area has several input fields:

- Requirement ID:** An empty text input field.
- Description:** A rich text editor toolbar with buttons for bold, italic, underline, strikethrough, superscript, font family (verdana), font size (16), font color (blue), and various alignment and style options.
- Category:** An empty text input field.
- Verification method:** A dropdown menu showing 'Inspection', 'Simulation', 'Demonstration', and a 'Derived?' checkbox.
- Derived justification:** An empty text input field.
- File Upload:** A 'Choose File' button with 'No file chosen' displayed, and a 'Remove Image?' checkbox.

At the bottom are three buttons: **Save Low Level Requirement**, **New Low Level Requirement** (highlighted in blue), and **Back**.

New Low Level Requirements Screen

Enter the Requirement ID (this is required to be filled in and must be unique; all other fields are optional). Enter a description for this Low Level Requirement. If you wish you may enter a category for this low level requirement. You may select one or more verification methods. If this Low Level Requirement is safety related click the Safety Related checkbox. If this Low Level Requirement is Derived click the Derived checkbox. If you click the Derived checkbox you must enter the reason the Low Level Requirement is derived in Derived Justification. You may also choose a graphic file on your computer (gif, png or jpeg; this should be no larger than 40x40 pixels) to be displayed in the Low Level Requirement List for the Low Level Requirement. If you are editing a Low Level Requirement and wish to remove the image, click the Remove Image checkbox. You can Select **Save Low Level Requirement** to create the Low Level Requirement or **Back** to exit without saving the Low Level Requirement.

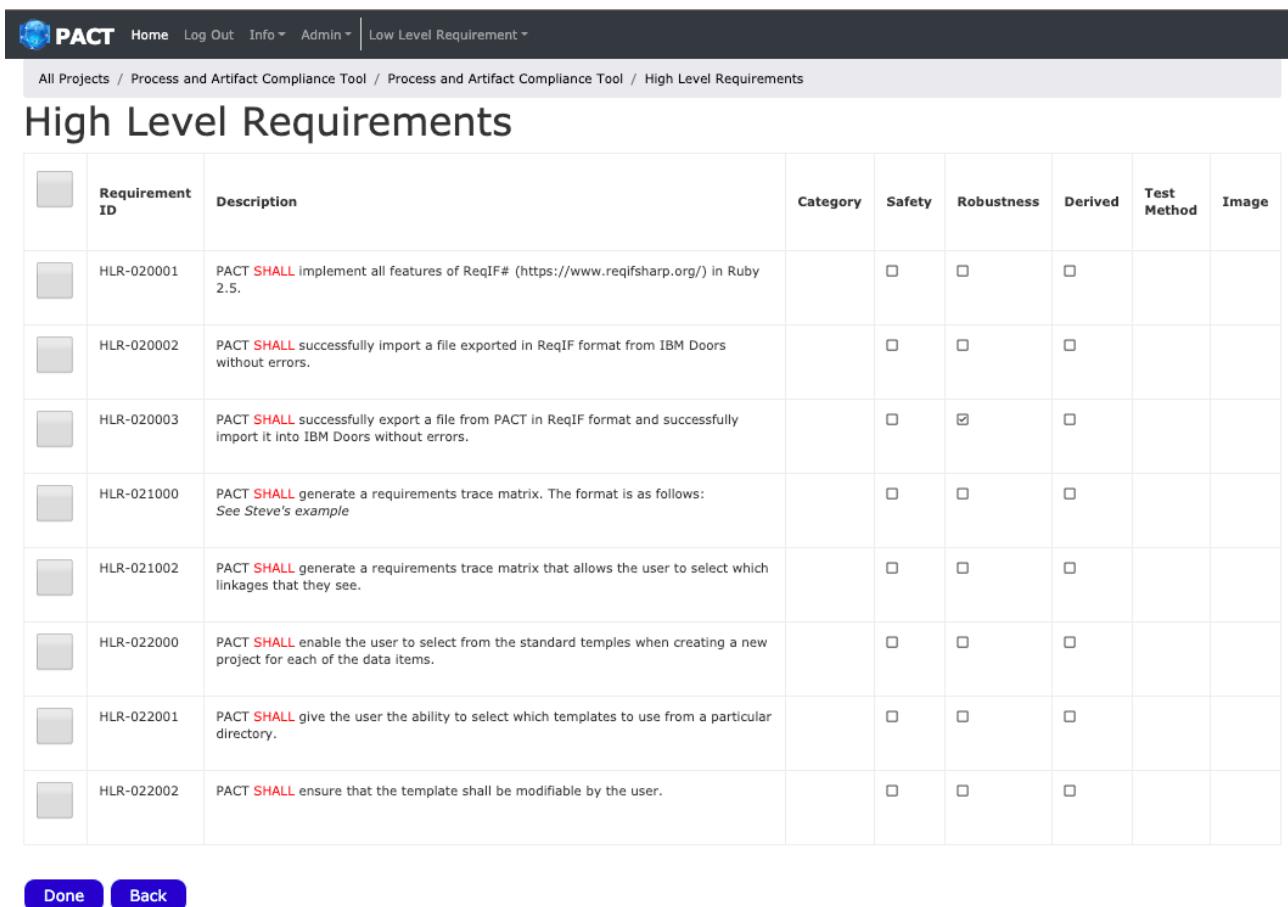
2.7.2.3 CONFIGURATION ITEM - EDITING A LOW LEVEL REQUIREMENT

To edit a **Low Level Requirement**, from the **Low Level Requirements List**, click the  icon for a specific **Low Level Requirement** or choose the  button from the **Low Level Requirement View Screen**. Editing a **Low Level Requirement** is identical to creating a new **Low Level Requirement** and all the fields are the same.

2.7.2.4 CONFIGURATION ITEM – LINKING LOW LEVEL REQUIREMENTS TO SYSTEM REQUIREMENTS

When editing a **Low Level Requirement**, you have the option to link the **Low Level Requirement** to one or more **High Level Requirements**. To do this click the

 button.



Requirement ID	Description	Category	Safety	Robustness	Derived	Test Method	Image
HLR-020001	PACT SHALL implement all features of ReqIF# (https://www.reqifsharp.org/) in Ruby 2.5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020002	PACT SHALL successfully import a file exported in ReqIF format from IBM Doors without errors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020003	PACT SHALL successfully export a file from PACT in ReqIF format and successfully import it into IBM Doors without errors.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
HLR-021000	PACT SHALL generate a requirements trace matrix. The format is as follows: <i>See Steve's example</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-021002	PACT SHALL generate a requirements trace matrix that allows the user to select which linkages that they see.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022000	PACT SHALL enable the user to select from the standard temples when creating a new project for each of the data items.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022001	PACT SHALL give the user the ability to select which templates to use from a particular directory.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022002	PACT SHALL ensure that the template shall be modifiable by the user.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Done **Back**

Select High Level Requirements Screen

You may click the checkbox before one or more **High Level Requirements**. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking  will link the **Low Level Requirement** to the **High Level requirement(s)**.  will return without making any changes.

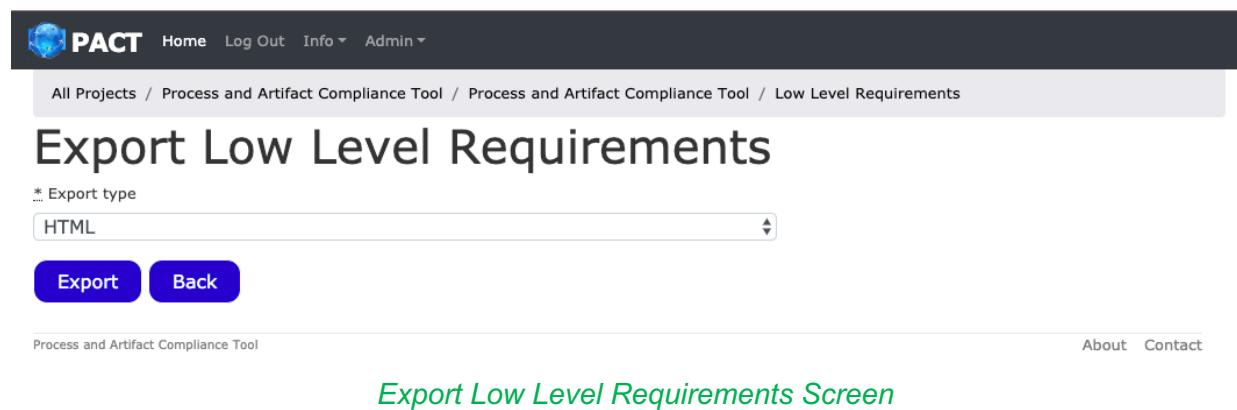
2.7.2.5 CONFIGURATION ITEM - VIEWING A LOW LEVEL REQUIREMENT

To view a Low Level Requirement, from the Low Level Requirements List, click the  icon for a specific Low Level Requirement or choose the  button from the Low Level Requirement Edit Screen.

2.7.2.6 CONFIGURATION ITEM - EXPORTING LOW LEVEL REQUIREMENTS

Exporting **Low Level Requirements** permits you to save the **Low Level Requirements** for a **Configuration Item** to a file that can be imported into another application. You can export **Low Level Requirements** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export Low Level Requirements, from the Low Level Requirements List, click the  button.



Export Low Level Requirements Screen

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the  button. The file will then download to your computer.

2.7.2.7 CONFIGURATION ITEM - IMPORTING LOW LEVEL REQUIREMENTS

Importing **Low Level Requirements** permits you to load the **Low Level Requirements** for a **Configuration Item** from another application. You can import **Low Level Requirements** from a Comma Separated Value (CSV) file or Excel File (XLS or XLSX).

The file should only contain data (**no headers or extraneous entries**) with lines in the format of:

```
Requirement_Number,Requirement_ID,Description,Category,Verification_Method,derived,derived_justification,version,high_levelrequirement_associations
```

To import Low Level Requirements, from the Low Level Requirements List, click the  button.



Import Low Level Requirements

* Item select

Process and Artifact Compliance Tool

Choose File No file chosen

 Duplicates permitted Association changes permitted**Load Low Level Requirements****Back**

Import Low Level Requirements Screen

Choose the file you would like to import. Click **Duplicates permitted** if you want to permit duplicate IDs to be imported. If you do not check **Duplicates permitted** and a **Low Level Requirement** already exists with the same ID as in the file when the file is imported, it will cause an error and the file will not be imported. Click **Association changes permitted** if you want to permit changes to **High Level Requirement** associations. If you do not check **Association changes permitted** and a **Low Level Requirement** already exists with the same ID as in the file when the file is imported and it changes the **High Level Requirement** associations, it will cause an error and the file will not be imported.

2.7.2.8 CONFIGURATION ITEM - RENUMBERING LOW LEVEL REQUIREMENTS

Renumbering **Low Level Requirements** permits renumbering the low level requirements starting at one and incrementing by one. To renumber **Low Level Requirements**, click **Renumber** from the **Low Level Requirements** list.

2.7.2.9 CONFIGURATION ITEM - DELETING LOW LEVEL REQUIREMENTS

From the **Low Level Requirements**, Clicking the or icons for a specific **Low Level Requirement** will delete that **Low Level Requirement**. Before deleting a **Low Level Requirement**, a confirmation dialog will appear asking if you are sure you want to delete the **Low Level Requirement**.

faaconsultants.com says

Are you sure?



The difference between **Mark as Deleted** and **Delete** is that **Mark as Deleted** will leave the low level requirement but empty its contents replacing it with deleted. This permits you to maintain a record that the **Low Level Requirement** existed at one time but was deleted. **Delete** will remove any trace of the **Low Level Requirement**.

2.7.3 CONFIGURATION ITEM- TEST CASES

Test Cases permits you to manage the **Test Cases** of the Configuration Item.

2.7.3.1 CONFIGURATION ITEM - TEST CASES LIST

Clicking the **Test Cases** link in the Navigation Column of a specific Configuration Item will display the **Test Cases List**. From here you can add a new **Test Case**, edit an existing **Test Case**, mark a **Test Case** as deleted, delete a **Test Case**, export **Test Cases**, import **Test Cases**, or renumber **Test Cases**.

The screenshot shows the PACT application interface for managing test cases. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and Test Cases. Below the navigation bar, the current location is shown as All Projects / XYZ Project / XYZ / Test Cases. The main title is "Test Cases". There is a search bar with a placeholder "Search:" and a filter button labeled "Filter". Below the title, there is a table with columns: Case ID, Description, Category, Robustness, Derived, High Level Requirements, Test Method, Image, Version, and several empty columns. A single row is visible in the table, representing a test case with the ID TC-0001, description "Test Importing System Requirements.", category "Software", robustness marked as "□", derived marked as "□", requirements "HLR-003002", method "Inspection", version "2", and icons for Show, Edit, Mark As Deleted, and Delete. At the bottom of the table, there are buttons for New Test Case, Export, Import, Renumber, Back, and Undo.

Case ID	Description	Category	Robustness	Derived	High Level Requirements	Test Method	Image	Version					
TC-0001	Test Importing System Requirements.	Software	□	□	HLR-003002	Inspection		2					

Test Cases List

2.7.3.2 CONFIGURATION ITEM - CREATING A NEW TEST CASE

Clicking the **New System Requirement** button from the Test Cases List permits you to create a new Test Case.

The screenshot shows the 'New Test Case' form in the PACT tool. At the top, there's a navigation bar with 'Home', 'Log Out', 'Info', 'Admin', and 'Test Case'. Below it, a breadcrumb trail shows 'All Projects / XYZ Project / Configuration Items - Artifacts / XYZ / Test Cases'. The main area is titled 'New Test Case'. It contains several input fields: 'Test Case ID' (a text input field), 'Description' (a text input field), and 'Procedure' (a rich text editor with a toolbar containing buttons for bold, italic, underline, etc.). Below these are sections for 'Image' (with 'Upload Image' and 'Remove Image' buttons), 'Category' (a text input field), and checkboxes for 'Robustness?' and 'Derived?'. There's also a 'Derived justification' text input field. At the bottom, there's a 'Test Method' dropdown set to 'Other', and a row of buttons: 'Save Test Case' (highlighted in blue), 'New Test Case', 'Back', and 'Undo'.

New Test Cases Screen

Enter the Case ID (this is required to be filled in and must be unique; all other fields are optional). Enter a description for this Test Case. If you wish you may enter a procedure for this test case. You may enter a category for this Test Case. If this Test Case is safety related click the Safety Related checkbox. If the Test Case is related to Robustness click the Robustness Checkbox. If you click the Derived checkbox you must enter the reason the High Level Requirement is derived in Derived Justification. You may select one or more verification methods. If this Test Case is safety related click the Safety Related checkbox. You may also enter a Test Method. You may also choose a graphic file on your computer (gif, png or jpeg; this should be no larger than 40x40 pixels) to be displayed in the Test Case List for the Test Case. If you are editing a Test Case and wish to remove the image, click the Remove Image checkbox. You can Select **Save Low Level Requirement** to create the Test Case or **Back** to exit without saving the Test Case.

2.7.3.3 CONFIGURATION ITEM - EDITING A TEST CASE

To edit a **Test Case**, from the **Test Cases List**, click the icon for a specific **Test Case** or choose the **Edit** button from the **Test Case View Screen**. Editing a **Test Case** is identical to creating a new **Test Case** and all the fields are the same.

2.7.3.4 CONFIGURATION ITEM – LINKING TEST CASES TO HIGH LEVEL REQUIREMENTS

When editing a **Test Case**, you have the option to link the **Test Case** to one or more **High Level Requirements**. To do this click the

Select High Level Requirements button.

Requirement ID	Description	Category	Safety	Robustness	Derived	Test Method	Image
HLR-020001	PACT SHALL implement all features of ReqIF# (https://www.reqifsharp.org/) in Ruby 2.5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020002	PACT SHALL successfully import a file exported in ReqIF format from IBM Doors without errors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020003	PACT SHALL successfully export a file from PACT in ReqIF format and successfully import it into IBM Doors without errors.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
HLR-021000	PACT SHALL generate a requirements trace matrix. The format is as follows: See Steve's example	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-021002	PACT SHALL generate a requirements trace matrix that allows the user to select which linkages that they see.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022000	PACT SHALL enable the user to select from the standard temples when creating a new project for each of the data items.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022001	PACT SHALL give the user the ability to select which templates to use from a particular directory.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022002	PACT SHALL ensure that the template shall be modifiable by the user.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Done **Back**

Process and Artifact Compliance Tool

About Contact

Select High Level Requirements Screen

You may click the checkbox before one or more **High Level Requirements**. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking **Done** will link the **Test Case** to the **High Level requirement(s)**. **Back** will return without making any changes.

2.7.3.5 CONFIGURATION ITEM - VIEWING A TEST CASE

To view a **Test Case**, from the **Test Cases List**, click the icon for a specific **Test Case** or choose the **Show** button from the **Test Case Edit Screen**.

2.7.3.6 CONFIGURATION ITEM - EXPORTING TEST CASES

Exporting **Test Cases** permits you to save the **Test Cases** for a **Configuration Item** to a file that can be imported into another application. You can export **Test Cases** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export **Test Cases**, from the **Test Cases List**, click the **Export** button.

All Projects / XYZ Project / XYZ / Test Cases

Export Test Cases

* Export type
HTML

Export **Back**

About Contact

Export Test Cases Screen

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the **Export** button. The file will then download to your computer.

2.7.3.7 CONFIGURATION ITEM - IMPORTING TEST CASES

Importing **Test Cases** permits you to load the **Test Cases** for a **Configuration Item** from another application. You can import **Test Cases** from a Comma Separated Value (CSV) file or Excel File (XLS or XLSX).

The file should only contain data (**no headers or extraneous entries**) with lines in the format of:

```
Case_Number,Case_ID,Description,Procedure,Category,Robustness,derived,derived_justification,version,test_method,high_levelrequirement_associations
```

To import **Test Cases**, from the **Test Cases List**, click the **Import** button.

All Projects / XYZ Project / XYZ

Import Test Cases

Choose File No file chosen

Duplicates permitted

Association changes permitted

Load Test Cases **Back**

About Contact

Import Test Cases Screen

Choose the file you would like to import. Click **Duplicates permitted** if you want to permit duplicate IDs to be imported. If you do not check **Duplicates permitted** and a **Test Case** already exists with the same ID as in the file when the file is imported, it will cause an error and the file will not be imported. Click **Association changes permitted** if you want to permit changes to **High Level Requirement** associations. If you do not check **Association changes permitted** and a **Test Case** already exists with the same ID as in the file when the file is imported and it changes the **High Level Requirement** associations, it will cause an error and the file will not be imported.

2.7.3.8 CONFIGURATION ITEM - RENUMBERING TEST CASES

Renumbering **Test Cases** permits renumbering the test cases starting at one and incrementing by one. To renumber **Test Cases**, click  from the **Test Cases** list.

2.7.3.9 CONFIGURATION ITEM - DELETING TEST CASES

From the **Test Cases**, Clicking the  or  icons for a specific **Test Case** will delete that **Test Case**. Before deleting a **Test Case**, a confirmation dialog will appear asking if you are sure you want to delete the **Test Case**.

faaconsultants.com says

Are you sure?



The difference between **Mark as Deleted** and **Delete** is that **Mark as Deleted** will leave the test case but empty its contents replacing it with deleted. This permits you to maintain a record that the **Test Case** existed at one time but was deleted. **Delete** will remove any trace of the **Test Case**.

2.7.4 CONFIGURATION ITEM - SOURCE CODES

Source Codes permits you to manage the **Source Codes** of the Configuration Item.

2.7.4.1 CONFIGURATION ITEM - SOURCE CODES LIST

Clicking the **Source Codes** link in the Navigation Column of a specific Configuration Item will display the **Source Codes List**. From here you can add a new **Source Code**, edit an existing **Source Code**, mark a **Source Code** as deleted, delete a **Source Code**, export **Source Codes**, import **Source Codes**, scan **Source Codes** from GitHub, scan **Source Codes** from GitLab, or renumber **Source Codes**.

Source Code ID	File Name	URL	Module	Function	Derived	Low Level Requirements	High Level Requirements	Image	Version	Show	Edit	Mark As Deleted	Delete
SCR-0027	app/models/source_code.rb	https://gitlab.faaconsultants.com/pact/pact/blob/master/app/models/source_code.rb	models	full could replace application traced_to_hlrs_to_csv_from_file from_xlsx_filename from_xls_filename from_csv_filename from_csv_io from_csv_string assign_column find_or_create_requirement_by_id	<input type="checkbox"/>				1	Show	Edit	Mark As Deleted	Delete
SCR-1000	source_codes_controller.rb	https://gitlab.faaconsultants.com/pact/pact/blob/master/app/controllers/source_codes_controller.rb	controllers	index, show, new, create, edit, update, destroy, source_code_params, associate_low_level_requirements, associate_high_level_requirements, import_source_codes, import, scan, select_files, generate, set_source_code, delete_image	<input type="checkbox"/>				3	Show	Edit	Mark As Deleted	Delete
SCR-2000	application_controller	https://faaconsultants.com/pact_awc/rails/active_storage/blobs/e9fcmPbHmOnsiltWVzc2FjZ5G1kjBaHBLzZ9lWjZxhWjpujdWxsLCwDxIOJlbG9IX2lkIn19-00d7edb44d341f61d3fae5e4411ad2f57be0b827/application_controller.pdf	controllers	set_github_access, user_not_authorized, set_current_user, set_organization, get_current_organization, set_time_zone, set_organization_cookie, get_cookies, delete_cookies	<input type="checkbox"/>				1	Show	Edit	Mark As Deleted	Delete

New Export Import Scan GitHub Scan GitLab Renumber Setup Coverage Process Profile Back Undo

Process and Artifact Compliance Tool About Contact

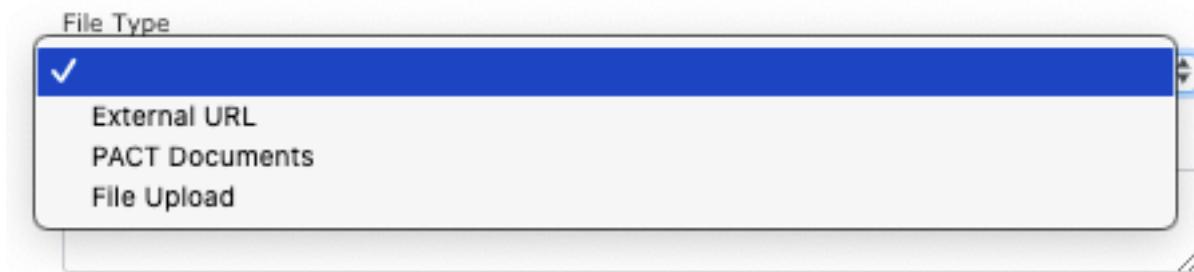
Source Codes List

2.7.4.2 CONFIGURATION ITEM - CREATING A NEW SOURCE CODE

Clicking the **New** button from the Source Codes List permits you to create a new **Source Code**.

The screenshot shows the 'New Source Code' creation interface. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, Source Code, All Projects, Process and Artifact Compliance Tool, Configuration Items - Artifacts, Process and Artifact Compliance Tool, Documents, and Source Codes. The main title is 'New Source Code'. Below it, there are several input fields: 'Source Code ID' containing 'SCR-0035', 'File name' (empty), 'File Type' (dropdown menu), 'Module' (empty), 'Function' (empty), and 'Derived justification' (empty). There is also a file upload section with 'Upload Image' and 'Choose File' buttons. At the bottom, there are four buttons: 'Save Source Code', 'New Source Code', 'Back', and 'Undo'.

Enter the Code ID (this is required to be filled in and must be unique). Enter the file name of the file that contains this Source Code. **The next field File Type lets you attach the file. When you select File Type you have 4 options:**



The top empty line says there is no file attached. If you want to use an external URL (like from GitHub choose **External URL**). A new field **URL** will appear below the control:

File Type

External URL

URL

A screenshot of a user interface showing a dropdown menu titled 'File Type' with 'External URL' selected. Below the dropdown is a text input field labeled 'URL' containing the URL 'https://gitlab.faaconsultants.com/pact/pact/blob/master/app/controllers/source_codes_controller.rb'.

Paste or type the URL in the field and that will attach it via the external URL.

File Type

External URL

URL

https://gitlab.faaconsultants.com/pact/pact/blob/master/app/controllers/source_codes_controller.rb

A screenshot of a user interface showing a dropdown menu titled 'File Type' with 'External URL' selected. Below the dropdown is a text input field labeled 'URL' containing the URL 'https://gitlab.faaconsultants.com/pact/pact/blob/master/app/controllers/source_codes_controller.rb'.

On the other hand, if you already added the source code files in PACT you can choose **PACT Documents**:

File Type

PACT Documents

PACT File

application_controller.pdf

A screenshot of a user interface showing a dropdown menu titled 'File Type' with 'PACT Documents' selected. Below the dropdown is a text input field labeled 'PACT File' containing the file name 'application_controller.pdf'.

A select control, **PACT File**, will appear below the select list. You can choose any of the files that were added in Documents in PACT.

If you'd rather not use an External URL or first upload the files in PACT, you can choose **File Upload**:

File Type

File Upload

Attach File

Choose File No file chosen

The Attach File field will appear. Click **Choose File** and navigate to the file you want to upload.

In either case finish filling out the Source code record entering any Modules and functions. If this Source Code is Derived click the Derived checkbox. If you click the Derived checkbox you must enter the reason the System Requirement is derived in Derived Justification. You may also choose a graphic file on your computer (gif, png or jpeg; this should be no larger than 40x40 pixels) to be displayed in the Source Codes List for the Source Code. If you are editing Source Code and wish to remove the image, click the Remove Image checkbox.

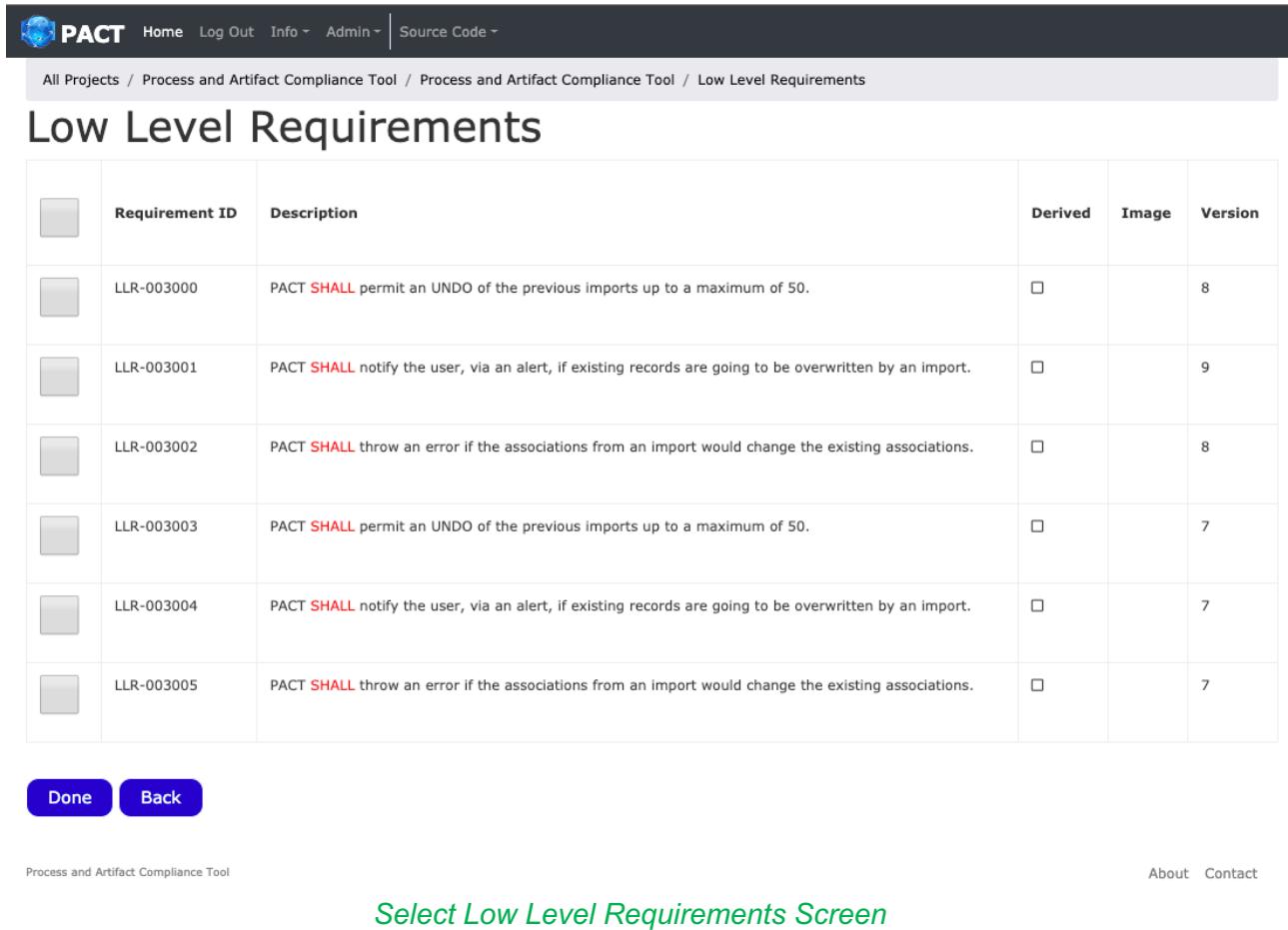
You can Select **Save Source Code** to create the source code or **Back** to exit without saving the Source Code.

2.7.4.3 CONFIGURATION ITEM - EDITING A SOURCE CODE

To edit a **Source Code**, from the **Source Codes List**, click the  icon for a specific **Source Code** or choose the **Edit** button from the **Source Code View Screen**. Editing a **Source Code** is identical to creating a new **Source Code** and all the fields are the same.

2.7.4.4 CONFIGURATION ITEM – LINKING SOURCE CODES TO LOW LEVEL REQUIREMENTS

When editing a **Source Code**, you have the option to link the **Source Code** to one or more **Low Level Requirements**. To do this click the **Select Low Level Requirements** button.



The screenshot shows a web-based application interface for managing low-level requirements. At the top, there's a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and Source Code options. Below the navigation is a breadcrumb trail: All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool / Low Level Requirements. The main title is "Low Level Requirements". A table lists seven requirements, each with a checkbox for selection. The columns are Requirement ID, Description, Derived, Image, and Version. The requirements are:

Requirement ID	Description	Derived	Image	Version
LLR-003000	PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	<input type="checkbox"/>		8
LLR-003001	PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	<input type="checkbox"/>		9
LLR-003002	PACT SHALL throw an error if the associations from an import would change the existing associations.	<input type="checkbox"/>		8
LLR-003003	PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	<input type="checkbox"/>		7
LLR-003004	PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	<input type="checkbox"/>		7
LLR-003005	PACT SHALL throw an error if the associations from an import would change the existing associations.	<input type="checkbox"/>		7

At the bottom left are "Done" and "Back" buttons. At the bottom right are "About" and "Contact" links. The center of the page displays the title "Select Low Level Requirements Screen" in green.

You may click the checkbox before one or more **Low Level Requirements**. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking **Done** will link the **Source Code** to the **Low Level requirement(s)**. **Back** will return without making any changes.

2.7.4.5 CONFIGURATION ITEM – LINKING SOURCE CODES TO HIGH LEVEL REQUIREMENTS

When editing a **Source Code**, you have the option to link the **Source Code** to one or more **High Level Requirements**. To do this click the **Select High Level Requirements** button.

Requirement ID	Description	Category	Safety	Robustness	Derived	Test Method	Image
HLR-020001	PACT SHALL implement all features of ReqIF# (https://www.reqifsharp.org/) in Ruby 2.5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020002	PACT SHALL successfully import a file exported in ReqIF format from IBM Doors without errors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-020003	PACT SHALL successfully export a file from PACT in ReqIF format and successfully import it into IBM Doors without errors.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
HLR-021000	PACT SHALL generate a requirements trace matrix. The format is as follows: See Steve's example	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-021002	PACT SHALL generate a requirements trace matrix that allows the user to select which linkages that they see.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022000	PACT SHALL enable the user to select from the standard temples when creating a new project for each of the data items.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022001	PACT SHALL give the user the ability to select which templates to use from a particular directory.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HLR-022002	PACT SHALL ensure that the template shall be modifiable by the user.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Done **Back**

About Contact

Select High Level Requirements Screen

You may click the checkbox before one or more **High Level Requirements**. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking **Done** will link the **Source Code** to the **High Level requirement(s)**. **Back** will return without making any changes.

2.7.4.6 CONFIGURATION ITEM - VIEWING A SOURCE CODE

To view a **Source Code**, from the **Source Codes List**, click the icon for a specific **Source Code** or choose the **Show** button from the **Source Code Edit Screen**.

2.7.4.7 CONFIGURATION ITEM - EXPORTING SOURCE CODES

Exporting **Source Codes** permits you to save the **Source Codes** for a **Configuration Item** to a file that can be imported into another application. You can export **Source Codes** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export **Source Codes**, from the **Source Codes List**, click the **Export** button.

All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool / Source Codes

Export Source Codes

* Export type

HTML

Export **Back**

About Contact

Export Source Codes Screen

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the **Export** button. The file will then download to your computer.

2.7.4.8 CONFIGURATION ITEM - IMPORTING SOURCE CODES

Importing **Source Codes** permits you to load the **Source Codes** for a **Configuration Item** from another application. You can import **Source Codes** from a Comma Separated Value (CSV) file or Excel File (XLS or XLSX).

The file should only contain data (**no headers or extraneous entries**) with lines in the format of:

```
Code_ID,Full_ID,filename,module,function,,derived,derived_justification,version,url_type,url_link,url_description,low_levelrequirement_associations,high_levelrequirement_associations
```

To import **Source Codes**, from the **Source Codes List**, click the

Import button.

All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool

Import Source Codes

Choose File No file chosen

Duplicates permitted

Association changes permitted

Load Source Codes **Back**

About Contact

Import Source Codes Screen

Choose the file you would like to import. Click **Duplicates permitted** if you want to permit duplicate IDs to be imported. If you do not check **Duplicates permitted** and a **Source Code** already exists with the same ID as in the file when the file is imported, it will cause an error and the file will not be imported. Click **Association changes permitted** if you want to permit changes to **Low Level Requirement or High Level Requirement** associations. If you do not check **Association changes permitted** and a **Source Code** already exists with the same ID as in the file when the file is imported and it changes the **Low or High Level Requirement** associations, it will cause an error and the file will not be imported.

2.7.4.9 CONFIGURATION ITEM – SCANNING GITHUB FILES

If your source code is held on GitHub you can automatically scan the Source Code Records into PACT. To do this you first need to setup your GitHub Credentials in PACT if you have not done so already. To do this choose **Info** from the menu at the top and then choose **Edit Github Credentials** from the dropdown menu.

The screenshot shows the 'Edit GitHub Credentials' page of the PACT application. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and GitHub Access. Below the navigation, a section titled 'All Projects' contains the heading 'Editing Github Credentials'. The main form has four fields: 'Username' (empty), 'Password' (empty), 'Token' (empty, with a small green GitHub icon to its right), and 'User' (set to 'Paul Carrick'). At the bottom of the form are four buttons: 'Save Credentials' (highlighted in blue), 'Show', 'Back', and 'Undo'.

Edit GitHub Credentials Screen

Enter either your GitHub Username and Password or the token you setup for access in GitHub and click **Save Credentials**.

Once your credentials are setup in PACT you can click **Scan GitHub** in the Source Codes List.



Scan for Source Files

Repository

funambol-outlook-client

Branch

master

Folder

outlook/UI/src

Scan**Back**

Process and Artifact Compliance Tool

About Contact

Scan GitHub Screen

Select the Repository, Branch and Folder you want to scan and press **Scan**.



Select Files

	Filename
<input type="checkbox"/>	<> outlook/UI/src/AccountSettings.cpp
<input type="checkbox"/>	<> outlook/UI/src/AccountSettings.h
<input type="checkbox"/>	<> outlook/UI/src/AnimatedIcon.cpp
<input type="checkbox"/>	<> outlook/UI/src/AnimatedIcon.h
<input type="checkbox"/>	<> outlook/UI/src/CalendarSettings.cpp
<input type="checkbox"/>	<> outlook/UI/src/SyncForm.h
<input type="checkbox"/>	<> outlook/UI/src/Welcome.cpp
<input type="checkbox"/>	▲ outlook/UI/src/res/OutlookPlugin.ico
<input type="checkbox"/>	▲ outlook/UI/src/res/left_separator.bmp
<input type="checkbox"/>	<> outlook/UI/src/resource.h

Select Files Screen

You may click the checkbox before one or more files. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking **Done** will import the files into the **Source Code List**. **Back** will return without making any changes.

2.7.4.10 CONFIGURATION ITEM – SCANNING GITLAB FILES

If your source code is held on GitLab you can automatically scan the Source Code Records into PACT. To do this you first need to setup your GitLab Credentials in PACT if you have not done so already. To do this choose **Info** from the menu at the top and then choose **Edit GitLab Credentials** from the dropdown menu.

The screenshot shows the PACT application's navigation bar with links for Home, Log Out, Info, Admin, and Gitlab Access. Below the navigation bar, a header says "All Projects". The main content area is titled "Editing Gitlab Credentials". It contains four input fields: "Username" (empty), "Password" (empty), "Token" (empty), and "Url" containing the value "https://gitlab.faaconsultants.com". At the bottom are four buttons: "Save Credentials" (highlighted in blue), "Show", "Back", and "Undo". Below the form, the footer includes links for Process and Artifact Compliance Tool, About, Contact, and a green link "Edit GitHub Credentials Screen".

Enter either your GitHub Username and Password or the token you setup for access in GitLab, enter the URL of the GitLab server and click **Save Credentials**.

Once your credentials are setup in PACT you can click **Scan GitLab** in the Source Codes List.



All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool

Scan for Source Files

Repository

funambol-outlook-client

Branch

master

Folder

outlook/UI/src

Scan**Back**

Process and Artifact Compliance Tool

About Contact

*Scan GitHub Screen*Select the Repository, Branch and Folder you want to scan and press **Scan**.



Select Files

	Filename
<input type="checkbox"/>	<> outlook/UI/src/AccountSettings.cpp
<input type="checkbox"/>	<> outlook/UI/src/AccountSettings.h
<input type="checkbox"/>	<> outlook/UI/src/AnimatedIcon.cpp
<input type="checkbox"/>	<> outlook/UI/src/AnimatedIcon.h
<input type="checkbox"/>	<> outlook/UI/src/CalendarSettings.cpp
<input type="checkbox"/>	<> outlook/UI/src/SyncForm.h
<input type="checkbox"/>	<> outlook/UI/src/Welcome.cpp
<input type="checkbox"/>	▲ outlook/UI/src/res/OutlookPlugin.ico
<input type="checkbox"/>	▲ outlook/UI/src/res/left_separator.bmp
<input type="checkbox"/>	<> outlook/UI/src/resource.h

Done**Back**

Select Files Screen

You may click the checkbox before one or more files. Clicking the checkbox at the top of the list will select or clear all checkboxes. Clicking **Done** will import the files into the **Source Code List**. **Back** will return without making any changes.

2.7.4.11 CONFIGURATION ITEM - RENUMBERING SOURCE CODES

Renumbering **Source Codes** permits renumbering the source codes starting at one and incrementing by one. To renumber **Source Codes**, click **Renumber** from the **Source Codes** list.

2.7.4.11.12 CONFIGURATION ITEM – SOURCE CODE - CODE COVERAGE

If you have purchased the Code Coverage option for PACT, you will see additional buttons in the

Source Code List    . In order to perform code coverage, you will need to perform several steps.

Code coverage in PACT entails setting Code Marks in your code that records which lines of the code are executed and optionally when they were hit. It can be used to identify coverage and can be used to identify dead code that should be removed or missing test cases. Optionally it can trace the path of execution through the code. This entails instrumenting your code with Macros that record when/if a particular line is executed, adding the code to PACT, executing the code in your runtime environment and then uploading the results into PACT which will then display a profile of your code.

If you want, PACT can automatically add Code Marks into your C or C++ source code. If so, skip to section 2.9.12.2 otherwise you will need to manually add the Code Marks. See section 2.9.12.1 below on manually Instrumenting your source code.

2.7.4.12.1 CONFIGURATION ITEM – SOURCE CODE – INSTRUMENTING C CODE

While PACT can instrument any source code that is based on text files, and can support any computer language that permits a statement like CMARK(n) or cmark(n), we will describe how to instrument a C file here.

In order to perform code coverage in PACT the C code must implement **Code Checkmarks**. You will need to edit your source code files to add **Code Checkmarks**. A **Code Checkmark** records if/when specific lines in the source code are executed. This is normally done via a C macro **CMARK...** The **CMARK** macro will record when/if a **CMARK...** macro is executed. In most cases this is done via writing a string to **STDOUT** that then can be redirected into a file which is then imported into PACT. PACT supports several different formats for the lines in a code coverage file so you can see the coverage percentage and the lines that were executed.

The simplest format is:

number
number
number

For Example:

1
2
3

This simply records that a particular **CMARK** was executed.

We can supply a file (**cmark.h**) that can be included in your source code files. The header file requires no other included files. It defines a macro **#define CMARK(n)**.

You simply add the line CMARK(n) at each point you want to record code coverage. For Example:

```
#include "cmark.h"

int main (int argc, char *argv[])
{
    int l;
    l = 1; CMARK(0);

    if (argc > 1)
    {
        i +=1; CMARK(1);
        ...
    }
}
```

The advantage is that this is the simplest implementation and requires the least impact on your code. The disadvantage is that it doesn't record when the Code Mark was hit and so cannot be used for tracing, only for code coverage.

Another format is:

The format is:

number,seconds.nanoseconds
number,seconds.nanoseconds
number,seconds.nanoseconds

For Example:

0,1577744431.470873000
1,1577744431.471032000
2,1577744431.471043000

This records that a particular CMARK was executed at a given time in seconds and .nnnn milliseconds from the Unix/Linux Epoch .

We can supply a file (**cmark_nanoseconds.h**) that can be included in your source code files. The header file requires **time.h** and that time.h defines **struct timespec** and implements **clock_gettime(CLOCK_REALTIME, struct timespec*)**. It defines a macro: **CMARK_NANSECONDS** (**#define CMARK_NANSECONDS(n)**).

You simply add the line CMARK_NANSECONDS(n) at each point you want to record code coverage. For Example:

```
#include "cmark_nanoseconds.h"

int main (int argc, char *argv[])
{
    int l;
    l = 1; CMARK_NANOSECONDS(0);

    if (argc > 1)
    {
```

```
i +=1; CMARK_NANOSECONDS(1);
...
}
```

The advantage is that this is the most precise definition and can be used for coverage tracing and profiling. The disadvantage is that `clock_gettime(CLOCK_REALTIME, struct timespec*)` must be available in your runtime environment.

Another format is:

number,seconds
number,seconds
number,seconds

For Example:

0,1577745741
1,1577745741
2,1577745741
3,1577745741

This simply records that a particular CMARK was executed at a given time in seconds from the system's Epoch.

We can supply a file (**cmark_seconds.h**) that can be included in your source code files. The header file requires **time.h** and that **time.h** defines **time_t** and implements **time(time_t *)**. It defines a macro: CMARK (**#define CMARK(n)**).

You simply add the line `CMARK_SECONDS(n)` at each point you want to record code coverage. For Example:

```
#include "cmark_seconds.h"

int main (int argc, char *argv[])
{
    int l;
    l = 1; CMARK_SECONDS(0);

    if (argc > 1)
    {
        i +=1; CMARK_SECONDS(1);
        ...
    }
}
```

The advantage is that this does not require `clock_gettime` but it does require `time()`. The disadvantage is that the resolution is only in seconds.

Another format is:

number,YYYY-mm-ddTHH:MM:SS
number,YYYY-mm-ddTHH:MM:SS
number,YYYY-mm-ddTHH:MM:SS

For Example:

0,2019-12-30T14:21:02
1,2019-12-30T14:21:02
2,2019-12-30T14:21:02

This simply records that a particular CMARK was executed at a given time.

We can supply a file (**cmark_strerror.h**) that can be included in your source code files. The header file requires **time.h** and that time.h defines **time_t** and implements **time(time_t *)**. It also requires stdio.h. It defines a macro: CMARK (**#define CMARK(n)**).

You simply add the line CMARK(n) at each point you want to record code coverage. For Example:

```
#include "cmark_strerror.h"

int main (int argc, char *argv[])
{
    int i;
    i = 1; CMARK_ STRFTIME (0);

    if (argc > 1)
    {
        i +=1; CMARK_ STRFTIME (1);
        ...
    }
}
```

The advantage is that the output is human readable, but it does require time() and stdio.h. The disadvantage is the resolution is only in seconds.

A final way to record hits is to use a bitmap:

number

For Example:

0x8000000003fe3def

This simply records that a particular CMARK was hit. By setting a bit for each CMARK hit.

You simply define:

```
#define CMARK_BITMAP(n, map) map |= 1LL << n;
unsigned long long int bitmap;
```

```
int main (int argc, char *argv[])
{
    int i;
    i = 1; CMARK_BITMAP (0, bitmap);

    if (argc > 1)
    {
        i +=1; CMARK_BITMAP (1, bitmap);
```

...
}

The advantage is that this does not require any external code or IO but you must provide a way to transfer the value to a file. The disadvantage is that there is no time recorded or how many times the mark is hit. Also depending on the system, you are limited to 64 CMARKS. However, you can use this in the case of an embedded system that has no IO.

2.7.4.12.2 CONFIGURATION ITEM – SOURCE CODE – SETTING UP COVERAGE

First you will need to get the Source Code records into PACT see sections (2.7.4.2, 2.7.4.9 and 2.7.4.10). Once you have the files in PACT click on the **Setup Coverage** button from the **Source Codes List**. This will record the CMARK statements in your source files before you compile and run the code on your target platform.

<input type="checkbox"/>	Code ID	Full ID	File Name	Module	Function
<input checked="" type="checkbox"/>	SCR-0002	uninstrumented_coverage.c	uninstrumented_coverage.c	Application	int main (int argc, char *argv[])

Auto Instrument: Yes Code Mark Macro: CMARK_NANOSECONDS

Done **Back**

About Contact

Setup Coverage Screen

Choose the files you want to analyze coverage on by clicking the checkboxes before them. If you want, you can have PACT automatically add the CMARKs to your source code. If you want to do this choose **Yes** for Auto Instrument otherwise leave it as no. If you chose to Auto Instrument your code you need to choose the CMARK type (see Section 2.9.12.2) and click the **Done** button.

If you have chosen to auto instrument your code, you will need to download the auto instrumented files. After you Setup Coverage you will find the instrument files in a folder called **Instrumented Code in Documents**. You can download the files by clicking on the **Document ID** in the **Document List**.

Next compile and run the files on the target system. When you run the files redirect the STDOUT to a log file (or files). This should record the lines and times that the specific code

marks were executed.

2.7.4.12.3 CONFIGURATION ITEM – SOURCE CODE – PROCESSING LOG FILES

In order to profile your source code you will need to process the log files you created in 2.9.12.2. To process the log files click on the **Process** button from the **Source Codes List**. This will process the log file and record the results.

The screenshot shows the 'Process Code Run Results' page. At the top, there is a navigation bar with links for Home, Log Out, Info, and Admin. Below the navigation bar, the breadcrumb path is 'All Projects / Code Coverage Example / Code Coverage Example / Source Codes'. The main title is 'Process Code Run Results' and the subtitle is 'Source Codes'. A table lists source codes with columns: Code ID, Full ID, File Name, Module, and Function. One row is shown with the following data: SCR-0002, uninstrumented_coverage.c, uninstrumented_coverage.c, Application, and int main (int argc, char *argv[]). Below the table is a file input field labeled 'Choose File' with the placeholder 'No file chosen'. At the bottom, there are two buttons: 'Process Code Run Results' and 'Back'.

Process Code Run Results Screen

Choose the files that were run to create the log file on by clicking the checkboxes before them and then chose the log file to upload. Finally click **Process Code Run Results**. A new screen **Run Results Profile** will appear.

The screenshot shows the 'Run Results Profile' page. At the top, there is a navigation bar with links for Home, Log Out, Info, and Admin. Below the navigation bar, the breadcrumb path is 'All Projects / Process and Artifact Compliance Tool / Code Coverage Example / Source Codes'. A green message box says 'Run results successfully processed.' The main title is 'Run Results Profile'. A table lists processed results with columns: Source Code ID, File Name, URL, Code Marks, Unique Code Mark Hits, Total Hits, and Coverage. One row is shown with the following data: SCR-0001, coverage_nano_seconds.c, coverage_nanoseconds.c, 36, 26, 44, and 72.22%. At the bottom, there is a 'Back' button.

Run Results Profile Screen

PROCESS AND ARTIFACT COMPLIANCE TOOL

In the Run Results Profile Screen, you will then see the coverage of all the Code Checkmarks hit. You can click on the number below **Code Marks**, **Total Hits** or **Code Marks Not hit** to see the Code Checkmarks.

The screenshot shows a table titled "Code Check Marks" with the following columns: Checkmark ID, Source code ID, Filename, Line number, and Statement. The table contains 21 rows of data, each representing a hit for checkmark ID SCR-0002. The statements listed in the "Statement" column include various C language constructs like printf, return, and for loops.

Checkmark ID	Source code ID	Filename	Line number	Statement
197	SCR-0002	uninstrumented_coverage.c	22	printf("In function call.\n");
198	SCR-0002	uninstrumented_coverage.c	27	return;
199	SCR-0002	uninstrumented_coverage.c	32	printf("Before exit.\n");
200	SCR-0002	uninstrumented_coverage.c	33	exit(0);
201	SCR-0002	uninstrumented_coverage.c	40	for (int i = 1; i < argc; i++)
202	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
203	SCR-0002	uninstrumented_coverage.c	48	test_if = TRUE;
204	SCR-0002	uninstrumented_coverage.c	49	test_while = TRUE;
205	SCR-0002	uninstrumented_coverage.c	50	test_for = TRUE;
206	SCR-0002	uninstrumented_coverage.c	51	test_do_while = TRUE;
207	SCR-0002	uninstrumented_coverage.c	52	test_switch = TRUE;
208	SCR-0002	uninstrumented_coverage.c	53	test_question_mark = TRUE;
209	SCR-0002	uninstrumented_coverage.c	54	test_break = TRUE;
210	SCR-0002	uninstrumented_coverage.c	55	test_default = TRUE;
211	SCR-0002	uninstrumented_coverage.c	56	test_return = TRUE;
212	SCR-0002	uninstrumented_coverage.c	57	test_function_call = TRUE;
213	SCR-0002	uninstrumented_coverage.c	58	test_exit = TRUE;
214	SCR-0002	uninstrumented_coverage.c	62	test_if = TRUE;

[Back](#)

Code Check Marks Screen

You will then see the Code Check Marks Screen. To see the hits, click on the **Checkmark ID**.

You can also click on the **Source Code ID** to see the Source Code Record or the **Filename** to see the file. To see the Code Checkmark Hit for a given Code Checkmark click on the number under Checkmark ID.

The screenshot shows a table titled "Code Checkmarks Hits" with the following columns: Checkmark ID, Hit At, Source code ID, Filename, Line number, and Statement. The table contains 20 rows of data, each representing a hit for source code ID SCR-0002. The statements listed in the "Statement" column are identical to those in the previous screenshot, all involving the assignment of a character argument from argv[i][1].

Checkmark ID	Hit At	Source code ID	Filename	Line number	Statement
202	2020-01-24 09:43:55.344588000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344616000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344629000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344642000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344654000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344666000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344678000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344690000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344702000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344714000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344725000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344737000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];
202	2020-01-24 09:43:55.344813000	SCR-0002	uninstrumented_coverage.c	44	char *argument = &argv[i][1];

[Back](#)

Code Check Mark Hits Screen

You will see a list of the times that the checkmark was Hit. For each hit you will see the **Checkmark ID** of the checkmark, the **Source Code ID** of the Source Code Record for that Checkmark, the **Filename** of the file, the **Line Number** that the checkmark is at and the **Statement** on that line.

2.7.4.12.4 CONFIGURATION ITEM - DELETING SOURCE CODES

From the **Source Codes**, Clicking the  or  icons for a specific **Source Code** will delete that **Source Code**. Before deleting a **Source Code**, a confirmation dialog will appear asking if you are sure you want to delete the **Source Code**.

faaconsultants.com says

Are you sure?



The difference between **Mark as Deleted** and **Delete** is that **Mark as Deleted** will leave the source code but empty its contents replacing it with deleted. This permits you to maintain a record that the **Source Code** existed at one time but was deleted. **Delete** will remove any trace of the **Source Code**.

2.7.5 CONFIGURATION ITEM – REQUIREMENTS TRACING MATRIX

Requirements Tracing Matrix permits you to see the requirements and the associations between them.

2.7.5.1 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX LIST

Clicking the **RTM** link in the Navigation Column of a specific Configuration Item will display the **Requirements Trace Matrix Requirements Trace Matrix**. From here you can choose to view the all the **System Requirements** and their associated **High Level Requirements/Low Level Requirements/Test Cases/Source Codes**, all the **System Requirements** and their associated **High Level Requirements/Low Level Requirements**, all the **System Requirements** and their associated **High Level Requirements**, all the **High Level Requirements** and their associated **Test Cases**, all the **High Level Requirements** and their associated **Low Level Requirements**, all the **Low Level Requirements** and their associated **Source Codes** or all Requirements without associations. Additionally, you can also export the requirements tracing matrix.

2.7.5.1 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX -

SYSTEM REQUIREMENTS → HIGH LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS/TEST CASES → SOURCE CODE

Clicking the System Requirements → High Level Requirements → Low Level Requirements/Test Cases → Source Code link in the Requirements Tracing Matrix List will display the entire chain of requirements from the System Requirements to the High Level Requirements to the Low Level Requirements/Test Cases to the Source Codes. It should be noted that this can get very wide and may be hard to read.

The screenshot shows a Requirements Tracing matrix with columns for System Requirements, High Level Requirements, Low Level Requirements/Test Cases, and Source Code. The rows represent specific requirements:

- System Requirements:** SYS-018000: PACT SHALL provide configuration management for all life cycle data.
- High Level Requirements:**
 - HLR-003010: PACT SHALL support the concept of Baseline, such that any subsequent changes to System Requirements automatically increments the version number.
 - HLR-003011: PACT SHALL support the concept of Baseline, such that any subsequent changes to System Requirements automatically increments the version number.
 - HLR-003012: PACT SHALL support the concept of Baseline, such that any subsequent changes to Low Level Requirements automatically increments the version number.
 - HLR-003013: PACT SHALL support the concept of Baseline, such that any subsequent changes to Low Level Requirements automatically increments the version number.
 - HLR-018000: PACT SHALL provide versioning for all life cycle data.
- Low Level Requirements/Test Cases:** LLR-018000: PACT SHALL provide versioning for documents. This row is expanded to show details about document revisioning.
- Source Code:** (This column is empty for the listed requirements)

LLR-018000:

PACT SHALL provide versioning for documents. When a new document is created, its draft revision SHALL default to 1.0 but SHALL be editable. The current revision SHALL be unset (blank) and the next revision SHALL be 1.1. When a document is updated, its draft revision's decimal portion SHALL increment by 1. If, for example, the draft revision is 1.0 it shall default to 1.1 when the document record is edited. The draft revision SHALL be editable. The current revision SHALL be unset (blank) and the next revision SHALL be 1.2. When the user edits the document record it will default to 1.2 but the user may edit it to any value greater than 1.2. The user may also choose to set the value to any value less than 1.2.

Initial Upload of New Document:

This section shows the initial upload of a new document named "GIVCO Code Analysis (Initial Draft)". The document is categorized under "Source Code Analysis". It has a file type of "Other Type of Document" and a draft revision of "1.0". The revision date is set to "2020-1-January-... 1:36:1".

Subsequent Upload of Existing Document:

This section shows the subsequent upload of the same document, "GIVCO Code Analysis (Initial Draft)", which now has a revision date of "2020-1-January-... 1:36:1".

System Requirements → High Level Requirements → Low Level Requirements/Test Cases → Source Code Screen

2.7.5.2 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX – SYSTEM REQUIREMENTS → HIGH LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS

Clicking the System Requirements -> High Level Requirements -> Low Level Requirements link in the Requirements Tracing Matrix List will display the chain of requirements from the System Requirements to the High Level Requirements to the Low Level Requirements.

The screenshot shows a web-based application interface for 'Requirements Tracing Matrix'. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and Requirements Tracing Matrix. Below the navigation is a header bar with 'All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool'. The main area is titled 'Requirements Tracing' and contains three columns:

- System Requirements**: Contains entries like 'SYS-006000: PACT SHALL provide an interface to perform Code Coverage for Software projects.' and 'SYS-007000: PACT SHALL provide a document commenting system for Documents.'
- System Requirements to High and LowLevel Requirements**: Shows associations between System Requirements and High Level Requirements. For example, 'SYS-006000' is linked to 'HLR-006000' and 'HLR-006001'. 'HLR-006000' is further associated with 'LLR-006000', 'LLR-006001', and 'LLR-006002'.
- High and LowLevel Requirements**: Contains detailed descriptions of the requirements, such as 'HLR-006000: PACT SHALL provide a method of connecting to the user's GitHub Repository.', 'HLR-006001: PACT SHALL ensure that the user can only access data in the GitHub repository that they have been given permission to.', and 'HLR-006002: PACT SHALL permit the user to select files from a specific repository, branch, and folder to use to generate the source code items.'

System Requirements → High Level Requirements → Low Level Requirements Screen

2.7.5.3 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX – SYSTEM REQUIREMENTS → HIGH LEVEL REQUIREMENTS

Clicking the System Requirements -> High Level Requirements link in the Requirements Tracing Matrix List will display the System Requirements and their associated High Level Requirements.

The screenshot shows a web-based application interface for 'Requirements Tracing Matrix'. At the top, there's a navigation bar with links for Home, Log Out, Info, Admin, and Requirements Tracing Matrix. Below the navigation is a header bar with 'All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool'. The main area is titled 'Requirements Tracing' and contains two columns:

- System Requirements**: Contains entries like 'SYS-001000: PACT SHALL provide an interface to manage Documents.'
- System Requirements to High Level Requirements**: Shows associations between System Requirements and High Level Requirements. For example, 'SYS-001000' is linked to 'HLR-001000'.
- High Level Requirements**: Contains detailed descriptions of the requirements, such as 'HLR-001000: PACT SHALL store the following information about Documents: • Document Unique ID • Document Type Code (i.e. SAD, HIR, PSAC, etc.) • Author • Reviewer • Review Status • Title • FDR • Last Started • Last Ended • Closed • Latest Released Revision • Related Files - why do we need this when we have the latest released and draft? • Latest Released Revision'.

System Requirements → High Level Requirements Screen

2.7.5.4 CONFIGURATION ITEM – REQUIREMENTS TRACING MATRIX - HIGH LEVEL REQUIREMENTS → TEST CASES

Clicking the High Level Requirements -> Test Cases link in the Requirements Tracing Matrix List will display the High Level Requirements and their associated Test Cases.

High Level Requirements → Test Cases Screen

2.7.5.5 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - HIGH LEVEL REQUIREMENTS → LOW LEVEL REQUIREMENTS

Clicking the High Level Requirements -> Low Level Requirements link in the Requirements Tracing Matrix List will display the High Level Requirements and their associated Low Level Requirements.

High Level Requirements → Low Level Requirements Screen

2.7.5.6 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - LOW LEVEL REQUIREMENTS → SOURCE CODE

Clicking the Low Level Requirements Source Code link in the Requirements Tracing Matrix List will display the Low Level Requirements and their associated Source Code Records.

The screenshot shows a table titled "Low Level Requirements to Source code". The columns are "Low Level Requirements" and "Source code". The "Low Level Requirements" column lists several requirements (LLR-003000 through LLR-003009) with their descriptions. The "Source code" column shows the file path "SCR-0010: app/models/document.rb" for the first requirement.

Low Level Requirements	Source code
LLR-003000: PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	SCR-0010: app/models/document.rb
LLR-003001: PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	
LLR-003002: PACT SHALL throw an error if the associations from an import would change the existing associations.	
LLR-003003: PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	
LLR-003004: PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	
LLR-003005: PACT SHALL throw an error if the associations from an import would change the existing associations.	
LLR-003006: PACT SHALL permit an UNDO of the previous imports up to a maximum of 50.	
LLR-003007: PACT SHALL notify the user, via an alert, if existing records are going to be overwritten by an import.	
LLR-003008: PACT SHALL throw an error if the associations from an import would change the existing associations.	
LLR-003009: PACT SHALL limit the choice for verification method to:	
• Inspection • Simulation • Demonstration • Test • Analysis • In-Circuit • Other	

Low Level Requirements → Source Code Screen

2.7.5.7 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX - ALL

Clicking the Low Level Requirements Source Code link in the Requirements Tracing Matrix List will display all the requirements.

The screenshot shows a table titled "System Requirements". The columns are "Untraced System Requirements" and "Source code". The "Untraced System Requirements" column lists several requirements (SYS-004000 through SYS-023040) with their descriptions. The "Source code" column shows the file path "SCR-0010: app/models/document.rb" for the first requirement.

System Requirements	Source code
SYS-004000: PACT SHALL provide tracing for requirements.	SCR-0010: app/models/document.rb
SYS-012000: PACT SHALL provide an interface to manage files.	
SYS-014000: PACT SHALL provide pre-defined data types for DO-178 lifecycle projects.	
SYS-015000: PACT SHALL provide pre-defined data types for DO-254 lifecycle projects	
SYS-016000: PACT SHALL provide pre-defined data types for DO-278 lifecycle projects.	
SYS-019000: PACT SHALL notify the user when the license is within 30 days of expiring.	
SYS-022000: PACT SHALL support the use of templates.	
SYS-023000: PACT SHALL resize the width of text fields in the web browser window such that fields containing variable-length text can expand and contract as the web browser window is resized to fill 80% of the web browser window.	
SYS-023010: PACT SHALL keep the headers, menus and navigation controls at the top of the browser window visible as the user scrolls the contents of the window.	
SYS-023020: PACT SHALL have the controls for saving the current record, returning to the previous screen, undoing (where applicable) and performing any other function on the current record at the top left of the window below the main menu.	
SYS-023030: PACT SHOULD whenever possible return the user to the previous screen at the item that the user was on previously if the user clicks the back button in the browser or chooses back from the navigation controls.	
SYS-023040: PACT SHOULD allow for 100 organizations with 600 users per organization.	
SYS-023050: PACT SHALL provide a mechanism to display the current version number.	

Low Level Requirements → Source Code Screen

2.7.5.8 CONFIGURATION ITEM - REQUIREMENTS TRACING MATRIX – EXPORT RTM

Exporting **RTM** permits you to save the **Requirements Tracing Matrix** for a **Configuration Item** to a file that can be imported into another application. You can export **Requirements Tracing Matrix** as a HTML document, PDF document, Comma Separated Value (CSV) file or an Excel File (XLS).

To export Requirements Tracing Matrix, from the Requirements Tracing Matrix List, click the **Export** button.

The screenshot shows the PACT web application interface. At the top, there is a dark header bar with the PACT logo, navigation links for Home, Log Out, Info, Admin, and Requirements Tracing Matrix, and a breadcrumb trail indicating the current location: All Projects / Process and Artifact Compliance Tool / Process and Artifact Compliance Tool. Below the header, the main title 'Export Requirements Tracing Matrix' is displayed in large, bold, dark font. Underneath the title, there is a label 'Export type' followed by a dropdown menu set to 'HTML'. At the bottom of the page, there are two buttons: 'Export' (highlighted in blue) and 'Back'. The footer contains links for Process and Artifact Compliance Tool, About, and Contact.

Export Requirement Tracing Matrix Screen

Choose the type of export you would like (HTML, PDF, CSV or XML) and click the **Export** button. The file will then download to your computer.

2.7.6 CONFIGURATION ITEM- DOCUMENTS

Documents permits you to manage the documents of the Configuration Item.

2.7.6.1 CONFIGURATION ITEM - DOCUMENTS LIST

Clicking the **Documents** link in the Navigation Column of a specific Configuration Item will display **Documents List**. From here you can add a new **Document**, edit an existing **Document**, delete a **Document** or Download a document.

Document ID	Name	Category	Revision	Revision Date	Comments					
Instrumented Code	Instrumented Code				Comments	Show	Edit	Delete	Download	
S_01_C_PSAC-DOWNLOAD.r2.doc	S_01_C_PSAC-DOWNLOAD.r2.doc	Planning Document	-		Comments	Show	Edit	Delete	Download	
S_02_C_SD.PSD.DOWNLOAD.r2.doc	S_02_C_SD.PSD.DOWNLOAD.r2.doc				Comments	Show	Edit	Delete	Download	
S_03_C_SVP.DOWNLOAD.r3.doc	S_03_C_SVP.DOWNLOAD.r3.doc				Comments	Show	Edit	Delete	Download	
S_04_C_SCMP.DOWNLOAD.r2.doc	S_04_C_SCMP.DOWNLOAD.r2.doc				Comments	Show	Edit	Delete	Download	
S_05_C_SQAP.DOWNLOAD.r2.doc	S_05_C_SQAP.DOWNLOAD.r2.doc				Comments	Show	Edit	Delete	Download	
S_06_C_SRS.DOWNLOAD.r2.doc	S_06_C_SRS.DOWNLOAD.r2.doc				Comments	Show	Edit	Delete	Download	

New Document Back Undo

Process and Artifact Compliance Tool About Contact

Documents List

In the **Documents List** clicking on the Document ID will download or open the Document (based on your browser configuration). unless the Document is a folder (indicated by a folder icon) in which case it will open the folder. There are two special folders that may appear in the Documents List. **Instrumented Code** Contains source code generated by PACT when it automatically instruments the code. **Archived Documents** contains older versions of Documents when a document is changed.

2.7.6.2 CONFIGURATION ITEM - CREATING A NEW DOCUMENT

Clicking the **New Document** button from the Documents List permits you to create a new Document.

The screenshot shows the PACT application interface. At the top, there is a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and Document dropdown menus. Below the navigation bar, the breadcrumb path is All Projects / Code Coverage Example / Configuration Items - Artifacts / Code Coverage Example. The main title is "New Document". The form fields include:

- * Document ID: An empty input field.
- Name: An empty input field.
- Category: An empty input field.
- Document type: A dropdown menu currently showing "Choose File" and "No file chosen".
- Draft Version: An input field containing "0.1".
- Revision: An empty input field.
- Revision Date: A date picker showing "2020 February 19".
- Release document: A button with a grey icon and the text "Release document".
- Action buttons at the bottom: "Create Document", "New Document", and "Back".

Enter the Document ID. Enter a name for Document. If you wish you may enter a category for this Document. You may select one or more verification methods. You should select a Document Type for this Document. Unless the Document Type is Folder you must attach a file. You may select a Revision Date. If this document is a release then check the Release document checkbox. You can Select **Create Document** to create the Document or **Back** to exit without saving the Document.

2.7.6.3 CONFIGURATION ITEM - EDITING A DOCUMENT

To edit a **Document**, from the **Documents List**, click the  icon for a specific **Document** or choose the **Edit** button from the **Document View Screen**. Editing a **Document** is identical to creating a new **Document** and all the fields are the same.

2.7.6.4 CONFIGURATION ITEM - VIEWING A DOCUMENT

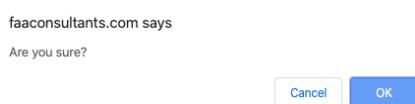
To view a **Document**, from the **Documents List**, click the  icon for a specific **Document** or choose the **Show** button from the **Document Edit Screen**.

2.7.6.5 CONFIGURATION ITEM – DOWNLOADING DOCUMENTS

From the **Documents List**, Clicking the  icon for a specific **Document** or clicking the **Document ID** will download that **Document**.

2.7.6.6 CONFIGURATION ITEM - DELETING DOCUMENTS

From the **Documents List**, Clicking the  or  icons for a specific **Document** will delete that **Document**. Before deleting a **Document**, a confirmation dialog will appear asking if you are sure you want to delete the **Document**.



2.7.6.7 CONFIGURATION ITEM – DOCUMENT VERSIONING

Documents in PACT are versioned. As a Document is updated older versions are archived. As each document is updated the Draft revision is incremented. The draft Revision starts at 0.0 and increments by 0.1 one each time it is updated. If a Document is released the Revision is incremented and the Draft Revision is reset. For example, initially a document starts with a Draft Revision of 1.0 and a Revision of ". If the Document is updated the Draft revision is incremented to 1.1. If the document is then released it the Revision will be A and the draft revision will be 1.0. The next release will increment the revision to B and the draft revision to 2.0.

In order to see the history of a document view the document in the Documents List by clicking the  icon for a specific **Document** or choosing the **Show** button from the **Document Edit Screen**. Then click the **Document History** button.

PROCESS AND ARTIFACT COMPLIANCE TOOL

Document History

History ID	Document ID	Name	Category	Draft Revision	Revision	Revision Date	Comments	Show	Download
1	PSAC	Plan for Software Aspects of Certification (Draft 0.1)	Planning Documents	0.1		2020-01-23	Comments		
2	PSAC	Plan for Software Aspects of Certification (Draft 0.2)	Planning Documents	0.2		2020-01-23	Comments		
3	PSAC	Plan for Software Aspects of Certification (Draft 0.3)	Planning Documents	0.3		2020-01-23	Comments		
4	PSAC	Plan for Software Aspects of Certification (Revision A)	Planning Documents	0.1	a	2020-01-23	Comments		
5	PSAC	Plan for Software Aspects of Certification (Revision A, Draft 0.2)	Planning Documents	0.2	a	2020-01-23	Comments		
6	PSAC	Plan for Software Aspects of Certification (Revision B)	Planning Documents	0.1	b	2020-01-23	Comments		
7	PSAC	Plan for Software Aspects of Certification (Revision B)	Planning Documents	0.2	b	2020-01-23	Comments		
8	PSAC	Plan for Software Aspects of Certification (Revision B)	Planning Documents	0.3	b	2020-01-23	Comments		
9	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	0.1	c	2020-01-23	Comments		
10	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.0	d	2020-01-23	Comments		
11	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.1	d	2020-01-23	Comments		
12	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.2	d	2020-01-23	Comments		
13	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.3	d	2020-01-23	Comments		
14	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.4	d	2020-01-23	Comments		
15	PSAC	Plan for Software Aspects of Certification (Revision C)	Planning Documents	4.5	d	2020-01-23	Comments		

[New Document](#) [Back](#)

Process and Artifact Compliance Tool

[About](#) [Contact](#)

Documents History List

2.7.7 CONFIGURATION ITEM- REVIEWS

Reviews permits you to manage the reviews of the Configuration Item.

2.7.7.1 CONFIGURATION ITEM - REVIEWS LIST

Clicking the **Reviews** link in the Navigation Column of a specific Configuration Item will display the **Reviews List**. From here you can add a new **Review**, edit an existing **Review** or delete a **Review**.

Reviews

Search:

Review ID	Review Type	Title	Evaluation Date	Description	Review Passing	Action Items	Version			
11	PSAC	PSAC Review	2020-01-13	Plan for Software Aspects of Certification	No	Link 1 open AI	1			

[New Review](#) [Back](#) [Undo](#)

Process and Artifact Compliance Tool

[About](#) [Contact](#)

Reviews List

2.7.7.2 CONFIGURATION ITEM - CREATING A NEW REVIEW

Clicking the **New Review** button from the Reviews List permits you to create a new Review.

The screenshot shows the PACT software interface with the following details:

- Header:** PACT Home Log Out Info Admin Review
- Breadcrumb:** All Projects / Review Example / Configuration Items - Artifacts / Software Example / Documents
- Title:** New Review
- Form Fields:**
 - Title: (empty input field)
 - Description: (empty input field)
 - Review type: (dropdown menu)
 - Specific Review: (dropdown menu)
 - Attachment Type: (dropdown menu)
 - Evaluators: (dropdown menu)
 - Admin User
 - Dave Newton
 - Michelle Lange
 - Evaldate: (date picker) 2020 February 20
- Buttons:** Create Review, Back

Enter the Review Title. Enter a description for the Review. You should select a Review Type for this Review.

Review type

- Transition Review
- Peer Review

Next select a Specific Type for this Review.

Specific Review

- Software Quality Assurance Plan
- Software Design Standards
- Software Requirements Standards
- Software Coding Standards
- System Requirements Document
- Software Design Description
- Source Code
- Software Modeling Standards
- Software Configuration Index
- Parameter Data Items
- Software Environment Configuration Index
- Software Verification Cases and Procedures
- Software Verification Results
- Model Coverage Analysis
- Structural Coverage Analysis
- Software Trace Matrix
- QA General Audit
- General - Final
- Plan for Software Aspects of Certification
- Software Development Plan
- Software Verification Plan

The next field File Type lets you attach a file. When you select File Type you have 4 options:

File Type

- External URL
- PACT Documents
- File Upload

The top empty line says there is no file attached. If you want to use an external URL (from a website choose **External URL**). A new field **URL** will appear below the control:

File Type

External URL

URL

Paste or type the URL in the field and that will attach it via the external URL.

File Type

External URL

URL

`https://gitlab.faaconsultants.com/pact/pact/blob/master/app/controllers/source_codes_controller.rb`

On the other hand, if you already added files in PACT you can choose **PACT Documents**:

File Type

PACT Documents

PACT File

`application_controller.pdf`

A select control, **PACT File**, will appear below the select list. You can choose any of the files that were added in Documents in PACT.

If you'd rather not use an External URL or first upload the files in PACT, you can choose **File Upload**:

File Type

File Upload

Attach File

Choose File No file chosen

The Attach File field will appear. Click **Choose File** and navigate to the file you want to upload.

Next Choose the evaluators. You can select more than one evaluator.

Evaluators

Admin User
Dave Newton
Michelle Lange
D. L. G.

Choose an evaluation date and click [Create Review](#).

2.7.7.3 CONFIGURATION ITEM - EDITING A REVIEW

To edit a **Review**, from the **Reviews List**, click the  icon for a specific **Review** or choose the  button from the **Review View Screen**. Editing a **Review** is identical to creating a new **Review** and all the fields are the same.

2.7.7.4 CONFIGURATION ITEM - VIEWING A REVIEW

To view a **Review**, from the **Reviews List**, click the  icon for a specific **Review** or choose the  button from the **Review Edit Screen**.

2.7.7.5 CONFIGURATION ITEM - DELETING REVIEWS

From the **Reviews List**, Clicking the  icons for a specific **Review** will delete that **Review**. Before deleting a **Review**, a confirmation dialog will appear asking if you are sure you want to delete the **Review**.

faaconsultants.com says

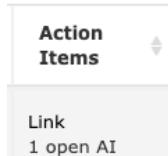
Are you sure?



2.7.7.6 CONFIGURATION ITEM – REVIEWS - ACTION ITEMS

Action Items permits you to manage the action items of a review.

2.7.7.6.1 CONFIGURATION ITEM - REVIEWS LIST



Clicking **Link** _____ in the **Actions Items** column of a specific action item will take you to the **Action Items List** for that Review. From here you can add a new **Action Item**, edit an existing **Action Item** or delete an **Action Item**.

The screenshot shows the PACT software interface. At the top, there is a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and Action Items dropdown menus. Below the navigation bar, the URL is All Projects / Review Example / Action Items. The main title is "Action Items". On the right, there is a search bar labeled "Search:" with a placeholder "Search". The central part of the screen is a table titled "Action Items" with the following columns: Action Item ID, Description, Opened By, Assigned To, Status, Note, and three icons for Show, Edit, and Delete. One row is visible in the table:

Action Item ID	Description	Opened By	Assigned To	Status	Note	Show	Edit	Delete
1	There is no system overview.	paul@patmos-eng.com	Paul Carrick	Open	Steve: Add a System Overview. Paul: I added System Overview. Steve: Yes but it's misspelled. Steve: Got that. it's fixed.			

At the bottom of the table, there are three buttons: "Return to Review", "New Action Item", and "Undo".

Action Items List

2.7.7.6.2 CONFIGURATION ITEM - CREATING A NEW ACTION ITEM

Clicking the **New Action Item** button from the Action Items List permits you to create a new Action Item.

The screenshot shows the PACT application interface. At the top, there is a navigation bar with links for Home, Log Out, Info, Admin, and Action Item. Below the navigation bar, a breadcrumb trail shows the current location: All Projects / Review Example / Configuration Items - Artifacts / Action Items. The main title is "New Action Item". The form fields include:

- Description:** An empty text input field.
- Opened By:** A dropdown menu containing "Paul Carrick".
- Assigned To:** A dropdown menu containing "Paul Carrick".
- Status:** A dropdown menu containing "Assigned".
- Note:** An empty text input field.

At the bottom of the form are three buttons: **Create Action item** (highlighted in blue), **New Action Item** (highlighted in blue), and **Back**.

Process and Artifact Compliance Tool

About Contact

New Action Item Screen

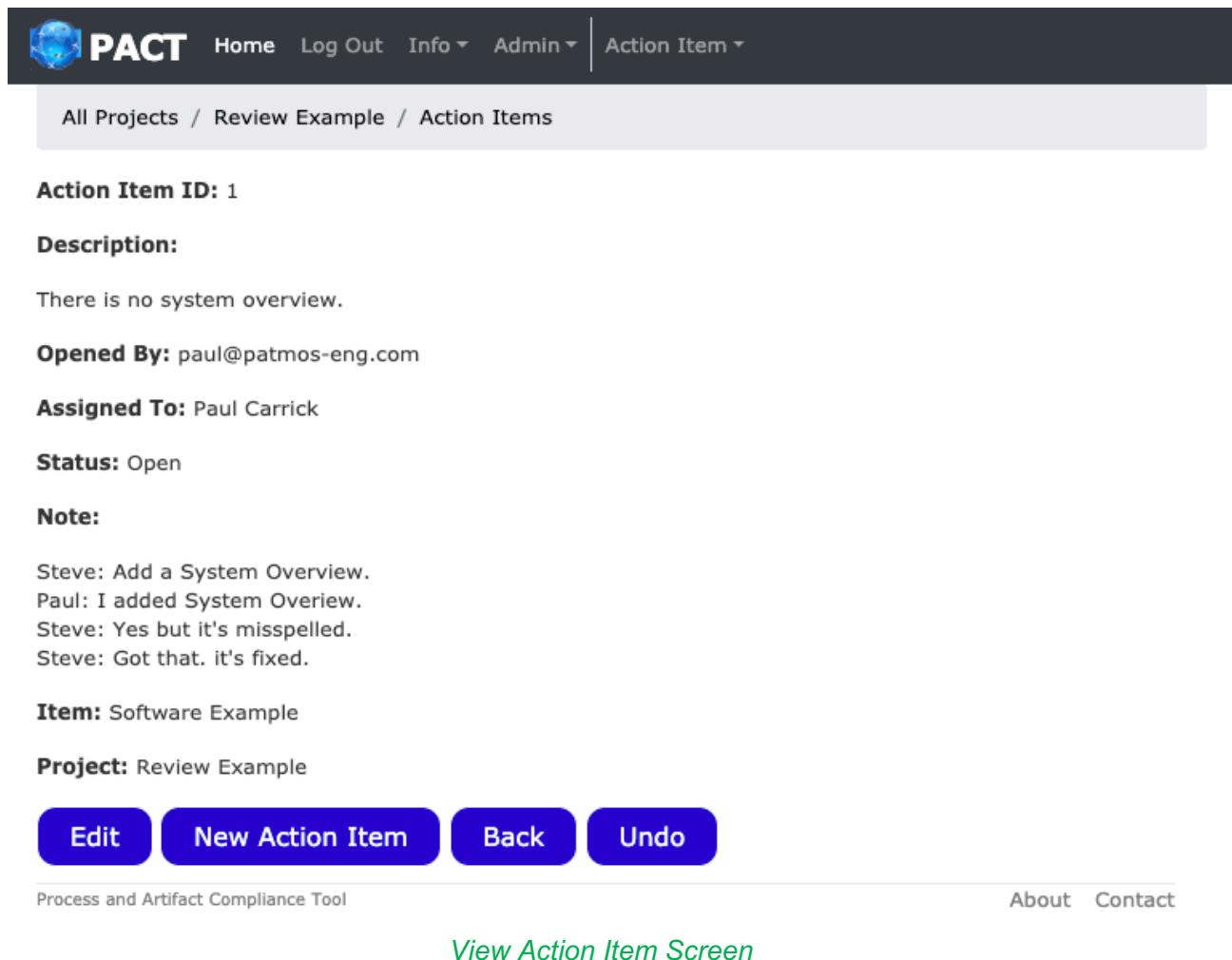
Enter a Description for the Action Item. Choose who this action item is assigned to. Optionally set the status of this Action Item and enter any notes then click **Create Action item**.

2.7.7.6.3 CONFIGURATION ITEM - EDITING AN ACTION ITEM

To edit an **Action Item**, from the **Action Items List**, click the icon for a specific **Action Item** or choose the **Edit** button from the **Action Item View Screen**. Editing an **Action Item** is identical to creating a new **Action Item** and all the fields are the same.

2.7.7.6.4 CONFIGURATION ITEM - VIEWING AN ACTION ITEM

To view an **Action Item**, from the **Action Items List**, click the  icon for a specific **Action Item** or choose the  button from the **Action Item Edit Screen**.



The screenshot shows the PACT application interface. At the top, there is a navigation bar with the PACT logo, Home, Log Out, Info, Admin, and Action Item dropdown menus. Below the navigation bar, the URL is shown as All Projects / Review Example / Action Items.

Action Item ID: 1

Description:
There is no system overview.

Opened By: paul@patmos-eng.com

Assigned To: Paul Carrick

Status: Open

Note:
Steve: Add a System Overview.
Paul: I added System Overview.
Steve: Yes but it's misspelled.
Steve: Got that. it's fixed.

Item: Software Example

Project: Review Example

At the bottom, there are four buttons: **Edit**, **New Action Item**, **Back**, and **Undo**. Below the buttons, the footer contains links for Process and Artifact Compliance Tool, About, Contact, and a green link labeled *View Action Item Screen*.

2.7.7.6.5 CONFIGURATION ITEM - DELETING ACTION ITEMS

From the **Action Items List**, Clicking the  icons for a specific **Action Item** will delete that **Action Item**. Before deleting a **Action Item**, a confirmation dialog will appear asking if you are sure you want to delete the **Action Item**.

faaconsultants.com says

Are you sure?

