



XFRACAS[®]

The only truly web-based, closed loop, user-configurable,
enterprise-wide FRACAS in a box!™

ReliaSoft[®]

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WHAT IS XFRACAS?

- ⦿ Complete system designed for managing, monitoring, controlling and understanding incidents and associated problems
- ⦿ Web-based for easy access, collaboration and deployment across multiple sites, suppliers and dealers
- ⦿ Integrated to allow for the capture of all relevant data for subsequent analysis
- ⦿ A comprehensive knowledge base and reliability data repository
- ⦿ A highly flexible and scalable enterprise system able to grow with your needs

XFRACAS IS A COMPLETE SYSTEM

- Safety management, quality tracking, risk reduction or FRACAS process management
- Part repair/replacement tracking and complete serialized system configuration management
- Customer support and failure (incident/issue) reporting
- Dashboard-style reporting: non-parametric progress tracking and reliability/quality reporting in an interactive graphical interface
 - Integration with parametric reliability analysis engines including life data, system reliability/maintainability and reliability growth analyses
- "Knowledge base" of product quality and reliability data that can be utilized by product safety, design, sales, management, procurement and other personnel

About this Overview

THE XFRACAS OVERVIEW

- ◎ This overview is designed to provide a general understanding of the XFRACAS system and allow you to assess how XFRACAS may improve your company process
- ◎ The following topics are covered:
 - Section 1: The XFRACAS Process
 - Introduces the system's unique ability to individually address both incidents and problems and expands on the incident/problem relationship. This section also presents high-level flowcharts of the XFRACAS process and the problem resolution process.

XFRACAS OVERVIEW (CONTINUED)

- **Section 2: The End User's Perspective**
 - Discusses standard navigation and reporting interfaces of the XFRACAS system, as viewed by an average user.
- **Section 3: Managing Incidents**
 - Discusses the incident creation process and the subsequent assignment of issues to problems. Incidents are the specific individual issues, while problems are the root causes for the incidents.
- **Section 4: Solving Problems**
 - Discusses how problems are addressed using a 4 to 8 step problem resolution process. This section provides an overview of these steps and shows sample user interfaces using an 8D process.

XFRACAS OVERVIEW (CONTINUED)

- **Section 5: Not Just FRACAS**
 - Discusses additional XFRACAS interfaces designed to cover all facets of the incident and problem resolution process over the entire life cycle of your product, including failure analysis (FA) information on returned parts, complete customer/vendor contact information and incident histories, installation details, system configuration information and other functionality.
- **Section 6: Administrative Interfaces**
 - Discusses the XFRACAS administrative interfaces. A system administrator can manage and reconfigure the system, user permissions and other aspects.

XFRACAS OVERVIEW (CONTINUED)

- **Section 7: System Architecture**
 - Discusses the web-based, n-tier, scalable and robust system architecture for XFRACAS.
- **Section 8: Advanced Reliability Analysis**
 - Discusses the ability of XFRACAS to provide direct integration with the most advanced suite of reliability engineering analysis tools.

YOUR IMPLEMENTATION MAY VARY

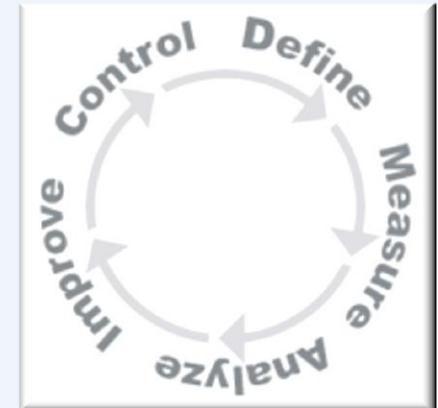
- ⦿ Please keep in mind that XFRACAS is customizable and different deployed systems will have different interfaces
- ⦿ These different interfaces can support many different types of processes, from safety management processes, to quality tracking processes, to FRACAS-type processes
- ⦿ The fields, inputs, options or lists shown here may or may not be applicable to your organization

The XFRACAS Process

A Conceptual Overview

CLOSING THE LOOP ON PROBLEM RESOLUTION

- ◎ XFRACAS is unique in its design and framework, as it can be used to address both individual incidents and the underlying problems
 - In XFRACAS terminology, a single “problem” can have many “incidents”
 - Incidents are dealt with as they occur while...
 - Problems (the underlying causes of the incidents) are analyzed and resolved through a formal problem resolution process (e.g., 8D, CAPA, DMAIC...)

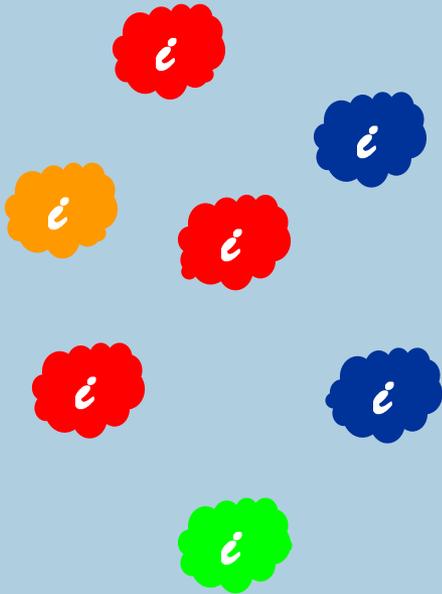


THE INCIDENT/PROBLEM RELATION

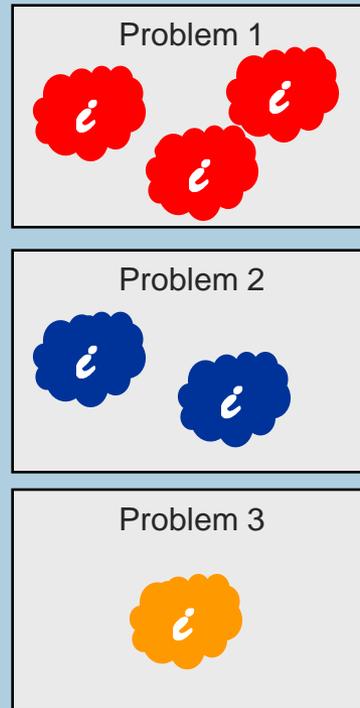
- ⦿ Incidents are issues/failures reported by customers, found during testing, etc.
- ⦿ Each incident can be attributed to one or more underlying problems, which could involve reliability, quality or safety issues
- ⦿ For example, if a product has a faulty component:
 - Multiple customers may experience/report a failure due to that component. Each failure is a separate *incident*.
 - All of these incidents are due to the same underlying issue. The *problem* is the faulty component.
 - Customer support or repair technicians will attempt to resolve each incident (i.e., get the customer up and running). However, the problem is resolved by dealing with the faulty component.

THE INCIDENT/PROBLEM RELATION

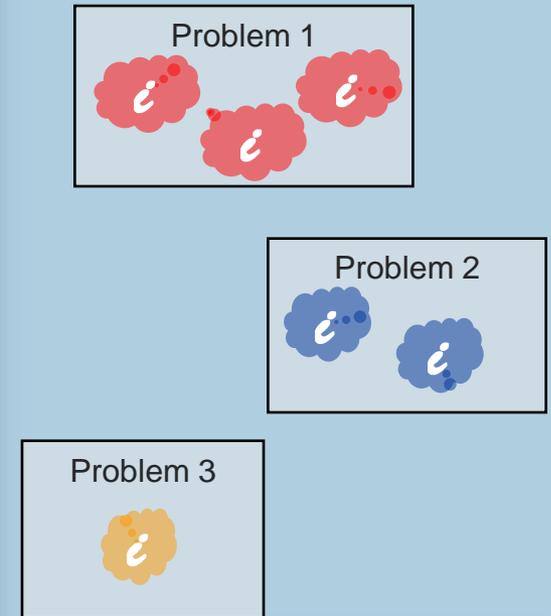
Incidents occur and are reported



Incidents are assigned to problems

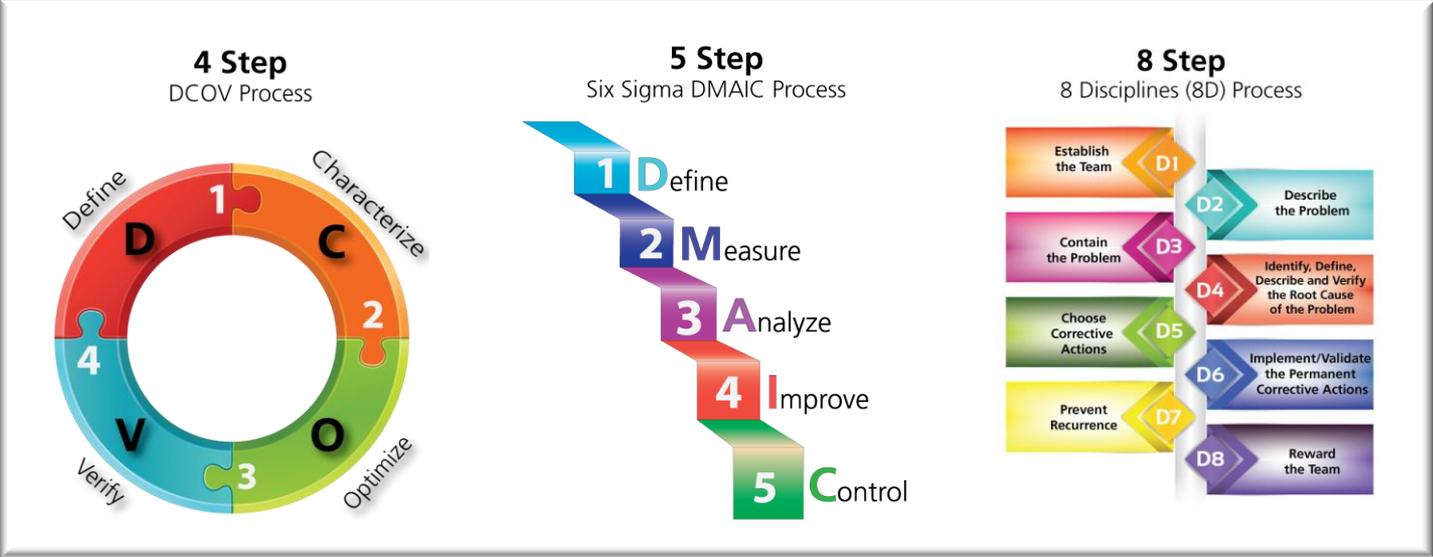


Problems are managed, tracked and resolved through a formal process



ADDRESSING AND RESOLVING PROBLEMS

- Once incidents have been classified into problems, engineering teams address and resolve the issues through a problem resolution process, with 4 - 8 steps. For example:



- The entire process is managed by XFRACAS, which in turn also becomes the data repository for subsequent analysis and lessons learned.

Reliable Products

Problem Resolved

Incident (Failure) Reporting

Incidents are reported from a variety of channels

Dashboard Reports & Metrics

- Reliability
- Quality
- Customer Support Efficiency
- Engineering Change Efficiency
- Warranty Projections
- etc...

Data Includes:

- Occurrence Date/Time
- Affected Part(s)
- Time to Failure
- Time to Repair
- Incident Description
- Fault Code(s)
- Part Repair or Replacements
- Incident Resolution
- etc...

Test/Inspection Facilities

Distributors or Suppliers

Customer Support

etc...

Technical/Customer Support

Troubleshooting

Incident Resolved

Reliability/Quality Knowledge Base

Information resource for troubleshooting and reports/analyses

Implement Changes

- Product Design Changes
- Manufacturing Changes
- Distribution Changes
- Documentation Changes
- etc...

Problem Resolution Process

4 - 8 step, such as:

- 8D
- DMAIC
- IDOV
- DCOV
- etc...

Data Includes:

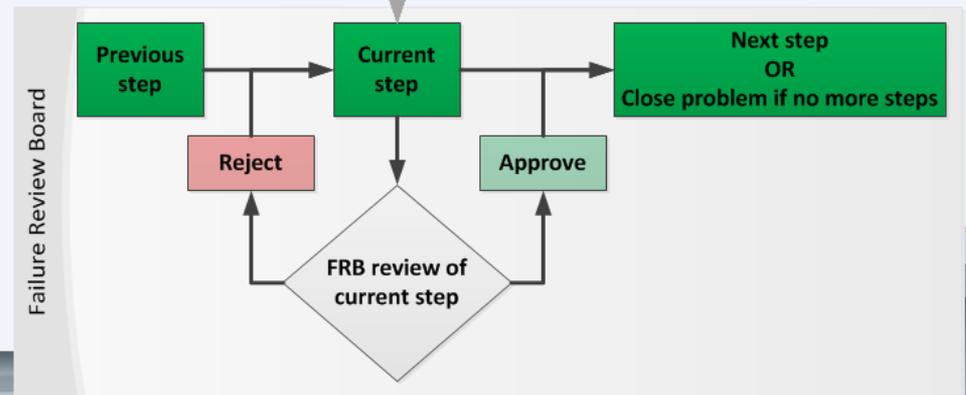
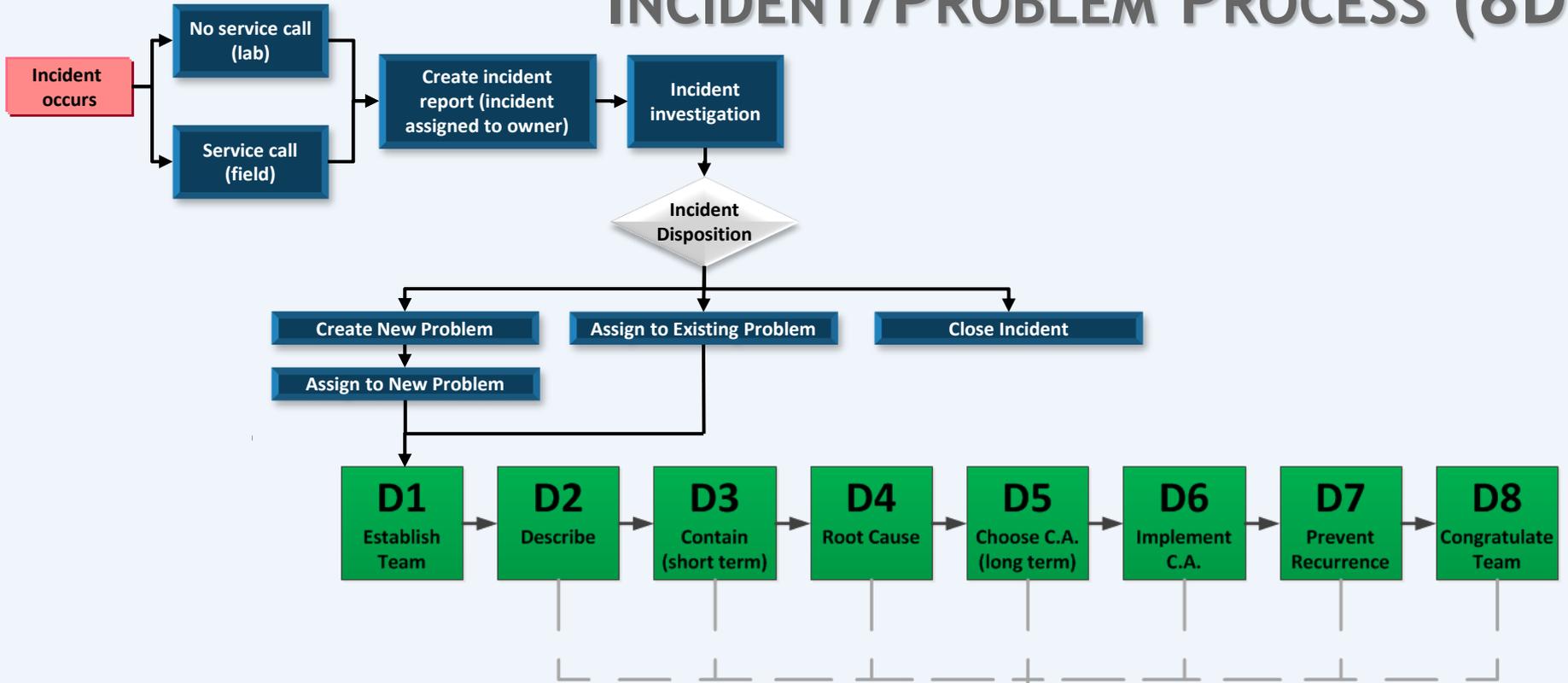
- Problem Description
- Associated Incidents
- Failure Mode
- Root Cause
- Problem Resolution
- Responsible Individuals
- etc...

Review Incidents and Identify Problems

Assign incidents to problems that can be tracked and resolved

- New Problem
- Existing (Known) Problem
- Disregard

INCIDENT/PROBLEM PROCESS (8D)



End User's Perspective

Navigating XFRACAS

XFRACAS PORTAL

- ◉ **When you log into the system, your personalized XFRACAS Portal will load. It provides a customizable at-a-glance view of all the issues you need to work on, including:**
 - Actions assigned to you that need to be completed
 - Incidents that you need to review
 - Problems that you need to work on
 - Solutions that you need to review and sign off on
- ◉ **You can easily add global or local announcements and links**
 - Global items can be seen by all users of the system*
 - Local items are seen only by you
- ◉ **You can also run saved custom reports, or have one automatically run when visiting this page**

**As with most XFRACAS features, the ability to add global items is permission-based*

XFRACAS PORTAL (SAMPLE SCREEN)

The screenshot shows the XFRACAS Portal interface in Internet Explorer. The browser title is "Portal - Acme Enterprises Proprietary and Confidential Information - Internet Explorer" and the URL is "http://xfracas/default.aspx". The navigation menu includes Home, System, Admin, and Options. A search bar for "Action #" is visible. The main content area is titled "Portal" and contains several sections:

- Announcements:** A section with the text "There are no announcements." A callout box labeled "Announcements" points to this section.
- Tasks:** A section containing several task lists:
 - Open Synthesis Actions (3):** A table with columns "Action #", "Action Description", and "3 are due". A callout box labeled "Actions from Synthesis desktop applications" points to this section.
 - Uncompleted Actions (1):** A table with columns "Action #", "Associated #", "Action Description", and "0 are due". A callout box labeled "My XFRACAS actions" points to this section.
 - Unclosed Incidents (1):** A table with columns "Incident #", "Status", "Description", and "1 are due". A callout box labeled "Incidents I need to work on" points to this section.
 - Open Problems (1):** A table with columns "Problem #", "Status", "Problem Title", and "1 are due". A callout box labeled "Problems I need to work on" points to this section.
 - Problems To Review (0):** A table with columns "Problem #", "Status", "Problem Title", and "0 are due". A callout box labeled "Problems I need to review" points to this section.
 - My Projects (0):** A table with columns "Project #", "Title", and "0 are due". A callout box labeled "Projects I need to work on" points to this section.

On the left side, there is a sidebar with a "USER NAME" field and a "Links" section. A callout box labeled "Links" points to the "Links" section, which contains links for "ReliaSoft Website" and "weibull.com". Below the links is a "My Reports" section with a link for "Incidents Created by Me".

REPORTS PAGE

- ⦿ **XFRACAS includes extensive reporting capabilities**
- ⦿ **By default, the system's Reports page offers both simple and complex predefined reports**
- ⦿ **Additionally, you can easily create your own custom ad-hoc reports and add them to the system both globally and locally**

REPORTS PAGE (SAMPLE SCREEN)

Use built-in reports or build complex ad-hoc reports

Saved custom reports

Saved public reports

Report: Incident - Internet Explorer

Results based on the following qualifier(s):
Entity = Acme Enterprises
9 match(es) found
Report Generated: 07/22/2015 11:08 AM

Incident Number	Occurrence Date	Category	Creator	Incident Owner
[-] Responsible Part: C1: Chandelier				
[+] Incident Status: Closed				
[-] Incident Status: Open				
REL-18	04/30/2013 11:32 AM	Component Failure	BRIAN BULB	MIKE MANAGER
[+] Responsible Part: CCF: Chandelier Composite Frame				
[+] Responsible Part: CLED: Chandelier LED				
[+] Responsible Part: FL1: Fluorescent Bulb				
[+] Responsible Part: WR1: Wiring				

[Create Filter](#)

AD-HOC DATA EXTRACTS

Use the reporting interface to extract data for further analyses

- Life data analysis
- System analysis
- Reliability growth analysis

The screenshot displays the XFRACAS Report Builder web application. The main interface includes a navigation menu with options like Home, System, Admin, and Options. The central area is titled 'Report Builder' and shows a 'Filter Criteria and Fields to Display' table. A 'Save Report' dialog box is open in the foreground, allowing users to save the report with a name, description, and icon.

Field	Show	Order	Criterion 1	&/Or	Criterion 2	Filter Group
Incident Number	<input checked="" type="checkbox"/>	1				1
Occurrence Date	<input checked="" type="checkbox"/>	2				
Incident Status	<input checked="" type="checkbox"/>	3				
Responsible Part	<input checked="" type="checkbox"/>	4				
Category	<input checked="" type="checkbox"/>	5				
Creator	<input checked="" type="checkbox"/>	6	NAME, USER			
Incident Owner	<input checked="" type="checkbox"/>	7				
Entity	<input type="checkbox"/>		Acme Enterprises			

Additional Fields: Action Count

Filter Criteria Groups

Group 1

Incident Number AND Occurrence Date AND Incident Status AND Responsible Part AND Category AND

Sorting

Output

Save Report

Report Name: Incidents Created by Me

Report Description: All incidents that I have created.

Report Icon: IncidentReport24.png

Save Report for another User: [dropdown]

Save report for a group: [dropdown]

Make Public

Add SDW data source

Save Cancel

DASHBOARD

- ⦿ **XFRACAS includes extensive graphing and trending capabilities**
- ⦿ **With the system's Dashboard functionality, you have access to simple and complex predefined graphs and tabular reports**
- ⦿ **Additionally, you can easily create your own custom Dashboard layouts and add them to the system both globally and locally**

DASHBOARD PAGE (SAMPLE SCREENS)

The dashboard is titled "Dashboard Designer - Acme Enterprises Proprietary and Confidential Information - Internet Explorer". It features a navigation menu with options like Home, System, Admin, and Options. The main content area is divided into several panels:

- USER NAME:** Includes links to "BellaSoft Website" and "weibull.com", and a "My Reports" section with "Incidents Created by Me".
- Dashboard Designer:** Allows users to select a dashboard layout (Default), number of rows (2), and number of columns (2).
- Panel 1:** Displays a bar chart for "Incident" reports.
- Panel 3:** Displays a bar chart for "Problem" reports.
- Incident Table:** A table listing incidents with columns for Incident Number, Occurrence Date, Incident Status, Responsible Part, and Category.

Incident Number	Occurrence Date	Incident Status	Responsible Part	Category
REL-9	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-10	4/29/2013	Closed	FRC1: Composite Frame	Com
REL-11	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-12	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-13	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-14	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-15	4/29/2013	In-Progress	FL1: Fluorescent Bulb	Com
REL-16	4/29/2013	Closed	FL1: Fluorescent Bulb	Com
REL-17	4/29/2013	Closed	WR1: Wiring	Com
REL-18	4/30/2013	Open	C1: Chandelier	Com
- Incident Pie:** A 3D pie chart showing the distribution of incident categories:
 - C1: Chandelier: 33%
 - CCF: Chandelier Composite Frame: 33%
 - CLED: Chandelier LED: 33%
 - FRC1: Composite Frame: 0%
- Incident by category:** A horizontal bar chart showing the count of incidents by category:
 - Preventative Maintenance: 1909
 - Component Failure: 1084
 - Installation Issue: 1080
- Repaired/Replaced Part by Date:** A line chart showing the count of parts repaired/replaced over time, including an EWMA trend line and an average line.

Date	Count
01-2013	97
02-2013	102
03-2013	112
04-2013	123
05-2013	105
06-2013	52

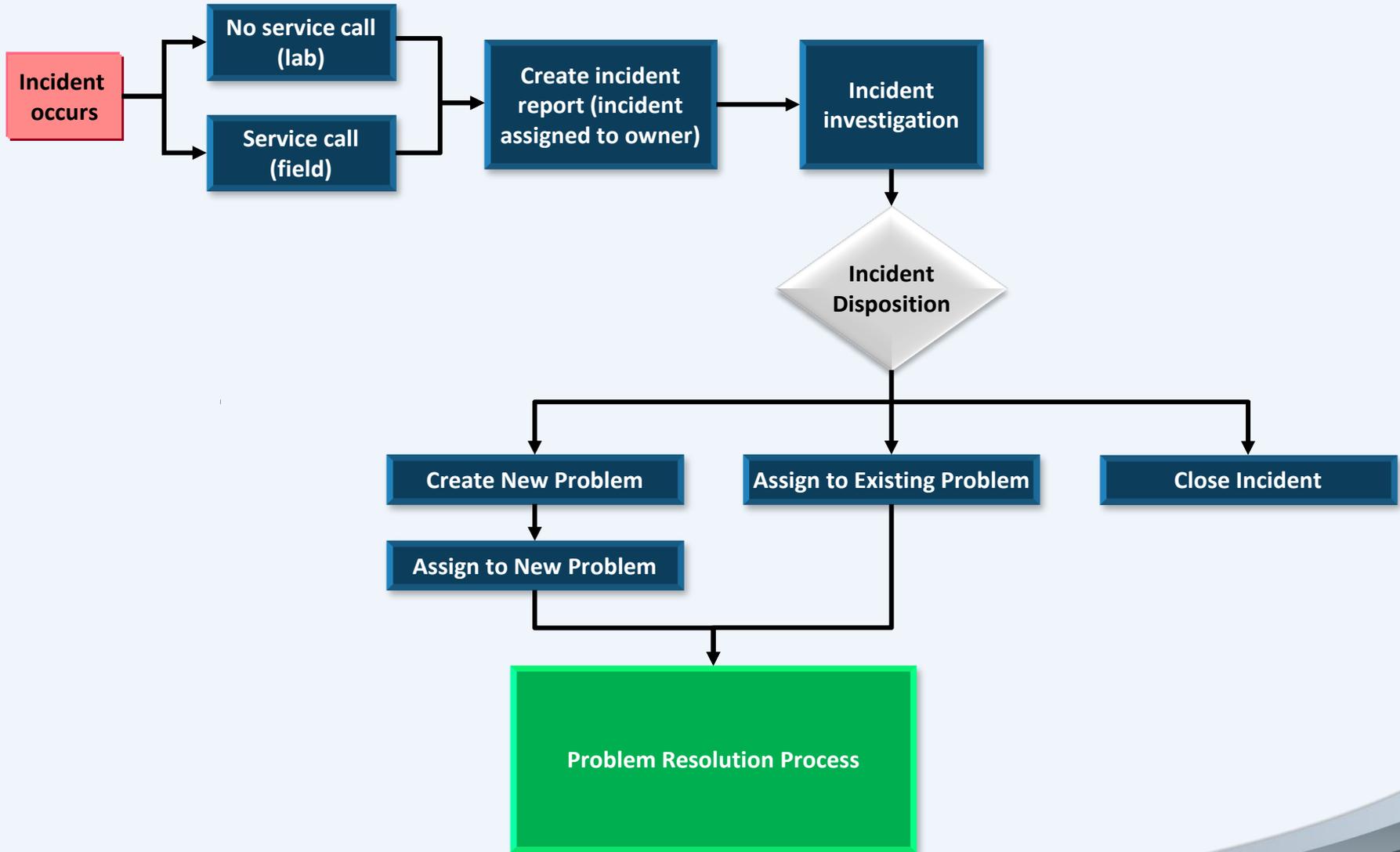
Managing Incidents

Initiating and Managing Incidents in XFRACAS

WHAT IS AN INCIDENT?

- ⦿ In general, most problems begin with incidents
- ⦿ What one defines as an incident is relative
 - An incident is basically an issue that needs to be addressed
 - An incident could be a customer-reported failure; an issue discovered during in-house testing; a customer's, engineer's or manager's suggestion; etc.

MANAGING INCIDENTS



INITIATING AN INCIDENT

- ⦿ For each incident, users begin by identifying the responsible system (or subsystem, assembly, part, etc.) on the Incident page in XFRACAS
- ⦿ XFRACAS captures relevant data such as:
 - System and part responsible (with serial numbers if desired*)
 - Time metrics
 - Incident description
 - Incident disposition actions
 - Other data for subsequent analysis
- ⦿ The Incident page includes multiple lookups and searches to assist in recording the details

**One great strength of XFRACAS is its complete support of serialized systems, with complete configuration management – down to the serial numbers of every component in a fielded unit if desired*

INITIATING AN INCIDENT (SAMPLE SCREEN 1)

The screenshot displays the XFRACAS web application interface in Internet Explorer. The browser address bar shows `http://xfracas/Incident.aspx`. The application has a top navigation menu with 'Home', 'System', 'Admin', and 'Options'. Below this is a toolbar with icons for 'XFRACAS', 'SEP', 'Reports', 'Charts', 'Dashboard', 'Incident', 'Problem', 'Project', 'Customer Support', 'Create', and 'Use Incident Wizard'. A secondary menu below the toolbar includes 'Portal', 'View', 'Create', and 'Incident'.

The main content area is titled 'New' and contains a 'System/Component Information' section. This section has a form with the following fields: 'Serial Number' (containing 'A'), 'Part Number', 'System Status' (a dropdown menu), 'System Hours', 'Number of Starts', 'kW Run Hours', and 'Unit Location'. A red circle highlights a '...' button next to the 'Serial Number' field. To the right of the form, there are labels for 'Last System', 'Last System', 'Last Number', and 'Last kW Ru'.

An 'Available Part Numbers' dialog box is open over the 'Serial Number' field. The dialog has a title bar and a close button. It contains the text: 'Selected Serial Number: A' followed by 'Multiple Serial Numbers found in database. Please select the Serial Number you want.' Below this, it lists 'Available Part Numbers:' with two entries: 'PN: A ver.vA, SN: Ab : System A' and 'PN: A ver.vA, SN: SN Aa : System A'. At the bottom of the dialog are 'Select' and 'Cancel' buttons.

Below the 'System/Component Information' section is the 'Incident Disposition' section, which includes: 'Occurrence Date' (Jul 23, 2015, Time: 04:31, AM/PM, Local Time), 'Incident Status' (Open), 'Report Type' (Customer Call), 'Category', 'Responsible Part' (Part), 'User' (User), 'Owner', 'Creator', 'System Down Event' (checkbox), and a 'Description' text area.

At the bottom of the page, there is a section for 'Incident Repair Information'.

INITIATING AN INCIDENT (SAMPLE SCREEN 2)

The screenshot displays the 'New Incident' form in the XFRACAS web application. The form is titled 'New' and is associated with 'Acme Enterprises'. It is divided into several sections:

- System/Component Information**: This section is currently collapsed.
- Incident Disposition**: This section contains the following fields:
 - Occurrence Date: Jul 23, 2015, Time: 04:31 PM (Local Time)
 - Incident Status: Open
 - Report Type: Customer Call
 - Category: (empty)
 - Responsible Part: Part (with a dropdown arrow) and User (with a dropdown arrow)
 - Owner: (empty)
 - Creator: (empty)
 - System Down Event:
 - Description: (empty text area)
- Incident Repair Information**: This section is currently collapsed.

Annotations on the right side of the screen provide instructions for the 'Responsible Part' and 'Description' fields:

- An arrow points from the text box 'The responsible part determines the responsible engineer' to the 'Responsible Part' dropdown menu.
- An arrow points from the text box 'Describe the incident' to the 'Description' text area.

DEALING WITH INCIDENTS

- ⦿ An incident may be dealt with during incident creation or at a later stage
- ⦿ Upon creation, each incident is automatically assigned to the responsible engineer (RE), based on the responsible part
 - REs are assigned by the system administrator when defining a system configuration
 - They can be assigned for any indenture level (e.g., system, subsystem, assembly, component)
- ⦿ The RE is automatically notified of the incident via an e-mail notification that contains a direct link to the Incident page
 - A link to the Incident page is also added to the RE's Portal

THE INCIDENT PAGE

- ④ The Incident page includes complete information regarding the incident and is available to both the RE and the incident creator (who may be the field repair person, support person, another engineer, etc.)
- ④ When working with serialized systems, the complete history of the specific system is also available, including its current configuration and full repair/issue history

INCIDENT PAGE (SAMPLE SCREENS)

ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

http://xfracas/Incident.aspx?ENTID=ACME-1

Home System Admin Options

XFRACAS SEP Reports Charts Dashboard Incident Problem Project Customer Support Save Print Preview Duplicate Export E-mail URL Copy URL Delete

Portal View Create Incident

USER NAME ACME-1 Acme Enterprises

Links

- ReliaSoft Website
- weibull.com

My Reports

- Incidents Created by Me

Assigned to Problem: N/A

System Configuration: SN:SN Aa, System A

Owner: USER, CATHY

Category: Component Failure

Occurrence Date: 07/23/2015 04:15 PM

System Status: Running Needs Service

Reporting Date: 07/23/2015 04:29 PM

Responsible Part: Component A.1: A.1 ver.vA.1

Incident Status: Open

Run Hrs / Starts / kW Hrs: 850 / N/A / N/A

Creator, Reporting Org: USER NAME, N/A

Unit Location: N/A

Serialized - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

http://xfracas/SystemConfiguration.aspx

Home System Admin Options

XFRACAS SEP Reports Charts Dashboard Incident Problem Project Customer Support Serialized Search Export

Portal View Create Serialized

USER NAME Serialized Acme Enterprises

Links

- ReliaSoft Website
- weibull.com

My Reports

- Incidents Created by Me

Find part on system...

- System A: A ver.vA SN:SN Aa
 - Component A.1: A.1 ver.vA.1 SN:A.1a
 - Component A.2: A.2 ver.vA.2 SN:SN A.2a
 - Sub-System A.3: A.3 ver.vA.3 SN:SN A.3a
 - Component A.3.1: A.3.1 ver.vA.3.1 SN:SN A.3.1a
 - Sub-Component A.3.1.1: A.3.1.1 ver.vA.3.1.1 SN:SN A.3.1.1a
 - Sub-System A.4: A.4 ver.vA.4 SN:SN A.4a
 - Component A.4.1: A.4.1 ver.vA.4.1 SN:SN A.4.1a
 - Component A.4.1: A.4.1 ver.vA.4.1 SN:SN A.4.2a
 - Component A.1: A.1 ver.vA.1 SN:SN A.1a [07/23/2015]

Starting Age 0

Serial HID 34436

Part Disposition Scrap (ACME-1)

Part Number A.1

Part Name Component A.1

Part Version vA.1

HID 395

Part ID 187

Level 2

System Parts 10

0 Children

RESOLVING THE INCIDENT

- ① The subsequent steps allow for both incident resolution and the assignment of the incident to a problem for resolution
- ① It is important to note that even though the incident may have been assigned to a problem for resolution, the incident itself may have to be dealt with independently by the person reporting it (e.g., replace/repair parts to get the customer up and running)

COMPLETE SUPPORT FOR REPAIRS

- ◎ For each incident, the complete repair history of the system is available and the current repair can be appended to the system's history, including serial numbers of failed/removed parts as well as serial numbers of new or used parts added to the system
 - This maintains the complete system configuration history and assures comprehensive time-to-failure/replacement data for each component
 - This information can be sent directly from XFRACAS to several of ReliaSoft's reliability analysis software products for additional analyses

REPAIR/REPLACE (SAMPLE SCREEN)

Past repair history, including failed/replaced parts and any failure analysis associated with each past action

Repair or Replace Parts

Original Part SN	Original Part Name	Orig Part #	Rev	Failure Analysis Report	Replacement Part SN	Rpl Part #	Rev
	Failure Type	Part Disposition	Hours to Failure		Starting Age		
	Return Type	RMA Number - Rcvd	SO Number				
SN A.1a	Component A.1 Primary Failure	A.1 Scrap	vA.1 850.00	New	A.1b N/A	A.1	vA.1
	N/A	N/A - N/A	N/A				

Repair or Replace Parts

Find part on system...

- System A: A ver.vA SN:SN Aa
 - Component A.1: A.1 ver.vA.1 SN:A.1b
 - Component A.2: A.2 ver.vA.2 SN:A.2a
 - Sub-System A.3: A.3 ver.vA.3 SN:SN A.3a
 - Component A.3.1: A.3.1 ver.vA.3.1 SN:SN A.3.1a
 - Sub-Component A.3.1.1: A.3.1.1 ver.vA.3.1.1 SN:SN A.3.1.1a
 - Sub-System A.4: A.4 ver.vA.4 SN:SN A.4a
 - Component A.1: A.1 ver.vA.1 SN:SN A.1a [07/23/2015]

ADDRESS THE PROBLEM

- ⦿ The Responsible Engineer (RE) must find, understand, resolve and prevent future occurrences of the problem that caused the incident
- ⦿ In accomplishing that, he/she is responsible for assigning the incident to a problem report that will enable the problem resolution process
- ⦿ The RE may assign incidents to either a new or an existing (open or closed) problem, or may reassign the incident to another RE altogether
- ⦿ The next section discusses the problem resolution process

Solving Problems

The Problem Resolution Process

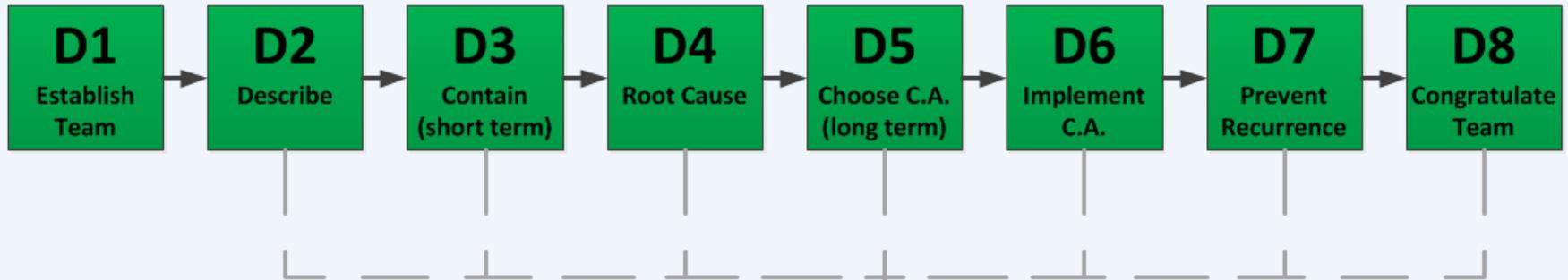
SOLVING PROBLEMS

- ⦿ **XFRACAS problem resolution uses a step-by-step approach to enable engineering teams to identify, understand, resolve and prevent the problem (which is associated with single or multiple incidents)**
 - This can be any problem resolution methodology, from four to eight steps (e.g., 4-step DCOV, 5-step Six Sigma DMAIC, 8-step 8 Disciplines, etc.)
- ⦿ **For most steps from the second step on, action items can be assigned to team members and their progress can be monitored and tracked**

SOLVING PROBLEMS

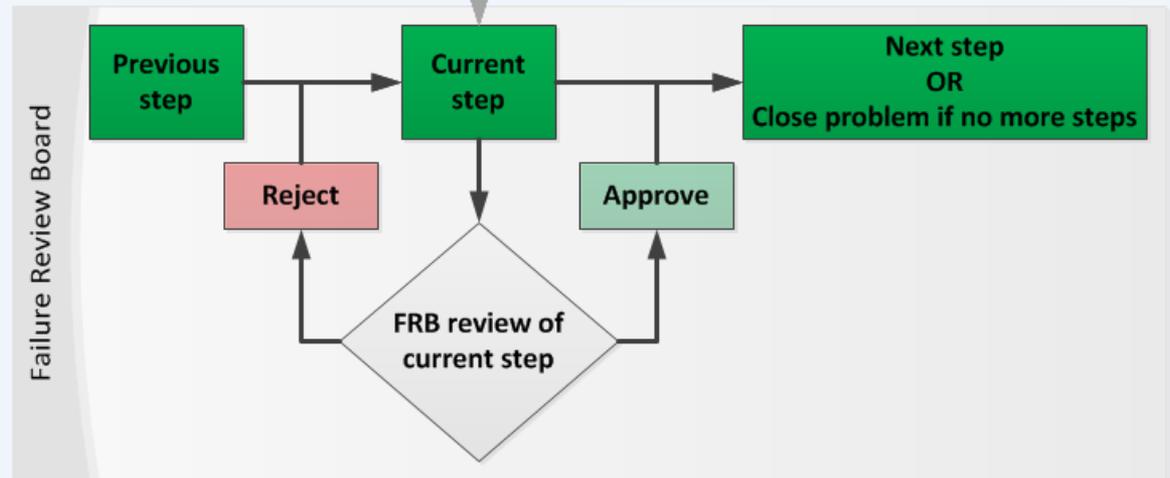
- ◉ From the second step on, you may be able to assign a Failure Review Board (FRB) to verify and sign off on the effectiveness of the actions defined for the step
 - XFRACAS automatically tracks this sign-off process; the XFRACAS Portal contains items that individuals need to review and sign off on
- ◉ The following slides demonstrate problem resolution using the 8 Disciplines (8D) process

PROBLEM RESOLUTION PROCESS - 8D



During any step, you can attach documents, such as:

- Technical service bulletin (TSB)
- Engineering change notice (ECN – design, retrofit)
- Quality control report (QCR)
- Supplier deviation request/ corrective action request (SCAR)
- etc...



STEP 1: D1 - ESTABLISH THE TEAM

- Establish the team with a team leader who has the knowledge, time, authority and skill to solve the problem and implement corrective actions

Note that XFRACAS can display all steps for a problem at once, or it can display the steps one at a time, which forces users to finish each step before moving on. The sample pictures that follow display all steps.

STEP 1: D1 (SAMPLE SCREENS)

The screenshot displays the XFRACAS web application interface in Internet Explorer. The browser title is "ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer" and the address bar shows "http://xfracas/PRR.aspx". The application has a navigation menu with "Home", "System", "Admin", and "Options". A toolbar contains icons for "XFRACAS", "SEP", "Reports", "Charts", "Dashboard", "Incident", "Problem", "Project", "Customer Support", "Save", "Print Preview", "Export", "E-mail URL", "Delete", and "Copy URL".

The main content area shows a problem record for "ACME-1 | Engine Does Not Make Full Power". The record details are as follows:

- Owner:** NAME, USER
- Priority:** High
- Last Occurrence:** N/A
- Creator:** NAME, USER
- Process Status:** Describe the Problem
- Expected Closure Date:** 08/27/2015
- Created Date:** 07/28/2015
- First Occurrence:** N/A
- Expected Closure Date:** N/A

The "Establish the Team" section shows the following information:

- Title:** Engine Does Not Make Full Power
- Team Members:** None Assigned
- Owner:** NAME, USER
- Priority:** High
- Expected Closure Date:** Aug 27 2015
- Time:** 02:44 AM
- Part Category Code:** [Remove](#) [A.3 ver. vA.3 : Sub-System A.3](#)

The "Describe the Problem" section is expanded, showing a list of actions:

- Describe the Problem
- Implement and Verify Containment Actions
- Identify and Verify Root Cause
- Choose and Verify Permanent Corrective Actions
- Implement Permanent Corrective Actions
- Prevent Recurrence
- Congratulate the Team

An "Assign Team Members" dialog box is open, showing a list of users:

- USER, CATHY
- USER, DAVID
- USER, ELLEN
- USER, FRANK

The "Team Member Role" is set to "Team Member". There is an "Add Team Member" button. The "Current Team Members" section shows:

- USER, ANN - Team Leader
- USER, BOB - Team Member

There is a "Remove Selected" button. The dialog box has "Save" and "Cancel" buttons at the bottom. A red circle highlights a "+" button in the top right corner of the "Establish the Team" section, with a red arrow pointing to the "Assign Team Members" dialog box.

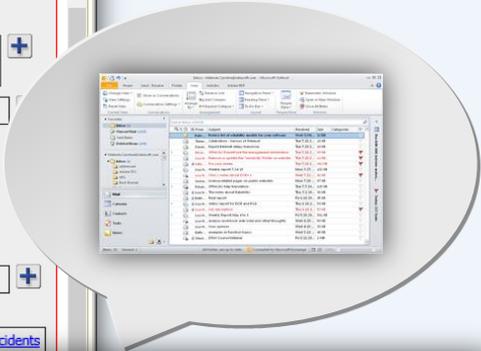
STEP 2: D2 - DESCRIBE THE PROBLEM

- ◉ Describe the problem in measurable and specific terms
 - Incidents and/or projects can be associated with the problem, along with references to other documents
 - The following slide shows D2, highlighting how actions can be used in this and subsequent steps

STEP 2: D2 (SAMPLE SCREENS)

The screenshot shows the XFRACAS web application interface. The browser title is 'ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer'. The URL is 'http://xfracas/PRR.aspx'. The navigation menu includes Home, System, Admin, Options, and Action #. The main content area displays a problem record for 'ACME-1 | Engine Does Not Make Full Power'. The problem description is 'Engine loses power.' The description actions table shows one action: 'Please find out why engine is losin...' with a due date of '08/05/2015' and owner 'USER, BOB'. The problem description status is 'None'. There are no references or associated files. At the bottom, it shows 'Associated Incident Reports: (Total: 5)' with a breakdown: Chargeable (2), Customer Call (1), and Field Issue (1).

- Action items are e-mailed to team members
- They are also added to their XFRACAS Portals
- Past due notices and reminders can also be utilized



Action items can be assigned to different team members, and can then be tracked

The screenshot shows the 'Create Problem Action Utility' dialog box. The title is 'Create Problem Action Utility - Acme Enterprises Proprietary and Confidential Information'. The dialog has a 'New Action' section. The 'Action Type' is 'Problem' and the 'Problem Number' is 'ACME-1'. The 'Problem Owner' is 'USER NAME'. There are two dropdown menus: '*Assign to:' with 'NAME, USER' selected and '*Category:' with 'Description' selected. The '*Due Date:' is set to 'Aug 6 2015'. There is a text area for '*Description:'. At the bottom, there are 'Create' and 'Cancel' buttons.

STEP 3: D3 - CONTAIN THE PROBLEM

- **Contain the problem by defining (and implementing) intermediate containment actions**
 - These actions should temporarily resolve customer issues (other incidents that may arise) until permanent corrective action can be implemented
 - The following slide shows D3, highlighting the FRB sign-off process

STEP 3: D3 (SAMPLE SCREENS)

Problem ACME-1 Reviewer List Selection Utility

Select up to 5 people to review Problem #ACME-1 step 3.
New reviewers will automatically receive e-mail regarding their selection.

Available Reviewers List

D3 Approver

- USER, ANN
- USER, BOB
- USER, CATHY
- USER, FRANK

Selected Reviewers List

- USER, ANN - D3 Approver
- USER, FRANK - D3 Approver

Save Cancel Help

Problem ACME-1

Created Date: 07/28/2015
First Occurrence: 07/23/2015

Identify and Verify Root Cause
Choose and Verify Permanent Corrective Actions
Implement Permanent Corrective Actions

Containment Actions: None

Completed By: NAME, USER

Completed Date: Jul 29 2015 Time: 09:34 AM Local Time

FRB Approved By: [Edit Reviewer List](#)

Reviewer Name	Category	Sign-off Date
USER, ANN	D3 Approver	Sign off: <input type="radio"/> Yes <input type="radio"/> No
USER, FRANK	D3 Approver	N/A

The current step in the process is highlighted in red

Set FRB members for containment approval

Sign-off available based on login credentials

STEP 4: D4 - ROOT CAUSE

- ④ **Identify/define, describe and verify the root cause of the problem, and list possible long-term corrective actions**
 - Root cause analysis can be done using several different methods
 - Supporting documents (e.g., fishbone diagram, brainstorming, testing results) can be attached to action items for both root cause analysis and root cause verification

STEP 4: D4 (SAMPLE SCREEN)

The screenshot displays the ACME-1 web application interface. The browser title is "ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer". The address bar shows "http://xfracas/PRR.aspx". The navigation menu includes Home, System, Admin, and Options. The main content area is titled "ACME-1 | Engine Does Not Make Full Power" and "Acme Enterprises". The workflow steps are: Establish the Team, Describe the Problem, Implement and Verify Containment Actions, and Identify and Verify Root Cause (highlighted in red). The "Identify and Verify Root Cause" section includes a "Failure Mode (0)" field, a "Root Cause Analysis" text area, a table of "Root Cause Analysis Actions" with one entry "2 Determine root cause.", a "Root Cause Status" dropdown set to "None", a "Root Cause Verification" text area, and a "Root Cause Verification Actions" dropdown set to "None". At the bottom, there are fields for "Completed By", "Completed Date" (Jul 2015), "Time" (10:07 AM), and "Local Time". A footer section includes "FRB Approved By" (with a link to "Edit Reviewer List"), "Reviewer Name" (N/A), "Category", and "Sign-off Date".

Analyze root cause

Verify root cause

Assign single or multiple failure modes



STEP 5: D5 - CHOOSE CORRECTIVE ACTION

- ④ Choose the corrective action(s) that will resolve the problem (root cause) for the customer and will not cause undesirable side effects
 - Choose from among the corrective actions identified in the previous step
 - Selected actions may be fixes for products in the field and/or products on the manufacturing floor, as well as design changes or manufacturing process changes for future products

STEP 5: D5 (SAMPLE SCREEN)

The screenshot displays the XFRACAS web application interface within an Internet Explorer browser window. The browser title is "ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer" and the address bar shows "http://xfracas/PRR.aspx".

The application interface includes a top navigation bar with tabs for "Home", "System", "Admin", and "Options". Below this is a toolbar with various icons for navigation and actions, including "XFRACAS", "SEP", "Reports", "Charts", "Dashboard", "Incident", "Problem", "Project", "Customer Support", "Save", "Print Preview", "Export", "E-mail URL", "Delete", and "Copy URL".

The main content area is titled "ACME-1 | Engine Does Not Make Full Power" and "Acme Enterprises". It displays the following information:

- Owner:** NAME, USER
- Creator:** NAME, USER
- Created Date:** 07/28/2015
- Priority:** High
- Process Status:** Choose and Verify Permanent Corrective Actions
- First Occurrence:** 07/23/2015
- Last Occurrence:** 07/28/2015
- Expected Closure Date:** 08/27/2015

The interface shows a list of actions to be completed, with the following steps expanded:

- Establish the Team
- Describe the Problem
- Implement and Verify Containment Actions
- Identify and Verify Root Cause
- Choose and Verify Permanent Corrective Actions** (highlighted in red)
- Implement Permanent Corrective Actions
- Prevent Recurrence
- Congratulate the Team

The "Choose and Verify Permanent Corrective Actions" section includes a text area for "Corrective Action Description:" and a table of "Corrective Actions":

Action Number	Short Description	Due Date	Owner
8	Determine appropriate corrective ac...	08/11/2015	NAME, USER

Below the table, there is a "Completed By:" dropdown menu, a "Completed Date:" field set to "Aug 2015" with a time of "02:39" and "PM" selected, and a "Local Time" dropdown. At the bottom, there is a section for "FRB Approved By:" with a link to "Edit Reviewer List", a "Reviewer Name" field (N/A), a "Category" field, and a "Sign-off Date" field.

STEP 6: D6 - IMPLEMENT/VALIDATE CA

- ⦿ **Implement/validate the permanent corrective actions needed and choose ongoing controls to ensure that the root cause is eliminated**
 - Make sure the fix(es) implemented resolved the issue
 - Ensure that no additional failure modes were introduced
 - Determine efficacy of fixes (i.e., what percentage of failures due to a given failure mode have been resolved)

STEP 6: D6 (SAMPLE SCREEN)

ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

http://xfracas/PRR.aspx

Home System Admin Options

XFRACAS SEP Reports Charts Dashboard Incident Problem Project Customer Support Save Print Preview Export E-mail URL Delete Copy URL

Portal View Create Problem

USER NAME

Links

- ReliaSoft Website
- weibull.com

My Reports

- Incidents Created by Me

ACME-1 | Engine Does Not Make Full Power Acme Enterprises

Owner: NAME, USER
 Creator: NAME, USER
 Created Date: 07/28/2015
 Priority: High
 Process Status: Implement Permanent Corrective Actions
 First Occurrence: 07/23/2015
 Last Occurrence: 07/28/2015
 Expected Closure Date: 08/27/2015

- Establish the Team
- Describe the Problem
- Implement and Verify Containment Actions
- Identify and Verify Root Cause
- Choose and Verify Permanent Corrective Actions
- Implement Permanent Corrective Actions**

Implement Corrective Action Description: Supplier changed to ABC Fuel Systems

Implementation Actions:

Action Number	Short Description	Due Date	Owner
9	Find a new fuel system supplier.	08/11/2015	NAME, USER

Completed By: [Dropdown]

Completed Date: Aug 2015 Time: 02:55 AM/PM Local Time

FRB Approved By: [Edit Reviewer List] Reviewer Name: N/A Category: Sign-off Date:

- Prevent Recurrence
- Congratulate the Team

STEPS 7 - 8: D7 - D8 - PREVENT RECURRENCE, CONGRATULATE TEAM

- ◉ **Step 7: Identify and implement steps that need to be taken to prevent recurrence (i.e., lessons learned)**
- ◉ **Step 8: Congratulate the team and describe lessons learned during the process or add closure comments (usually an optional step)**
- ◉ **Close the problem**
 - If applicable, request problem closure by the FRB
 - Problem can be closed using different statuses

STEP 7: D7 (SAMPLE SCREEN)

ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

http://xfracas/PRR.aspx

ACME-1 - Acme Enterprises ...

Home System Admin Options

Action #

XFRACAS SEP Reports Charts Dashboard Incident Problem Project Customer Support Save Print Preview Export E-mail URL Copy URL Delete

Portal View Create Problem

USER NAME

Links

- ReliaSoft Website
- weibull.com

My Reports

- Incidents Created by Me

ACME-1 | Engine Does Not Make Full Power Acme Enterprises

Owner: NAME, USER
Creator: NAME, USER
Priority: High
Last Occurrence: 07/28/2015
Created Date: 07/28/2015
Process Status: Prevent Recurrence
First Occurrence: 07/23/2015
Expected Closure Date: 08/27/2015

- Establish the Team
- Describe the Problem
- Implement and Verify Containment Actions
- Identify and Verify Root Cause
- Choose and Verify Permanent Corrective Actions
- Implement Permanent Corrective Actions

Prevent Recurrence

Prevent Recurrence Description:

Prevent Recurrence Actions:

Action Number	Short Description	Due Date	Owner
10	Determine ways to prevent the selec...	08/11/2015	NAME, USER

Completed By:

Completed Date: Aug 2015 Time: 02:59 AM PM Local Time

FRB Approved By: [Edit Reviewer List](#) **Reviewer Name:** N/A **Category:** **Sign-off Date:**

Congratulate the Team

STEP 8: D8 (SAMPLE SCREEN)

The screenshot shows the XFRACAS web application interface. The browser title is "ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer". The address bar shows the URL: `http://xfracassqlvm/10/SQL/V10Doc/PRR.aspx`. The application has a navigation menu with options: Home, System, Admin, Options. Below this is a toolbar with icons for XFRACAS, SEP, Reports, Charts, Dashboard, Incident, Problem, Project, Customer Support, Save, Print Preview, Export, E-mail URL, Copy URL, and Delete. The main content area is titled "Acme Enterprises" and displays a "Closure Requested" form. The form includes fields for Owner (NAME, USER), Priority (High), Last Occurrence (07/28/2015), Creator (NAME, USER), Process Status (Congratulate the Team), Expected Closure Date (08/27/2015), and Created Date (07/28/2015). A list of steps is shown: Establish the Team, Describe the Problem, Implement and Verify Containment Actions, Identify and Verify Root Cause, Choose and Verify Permanent Corrective Actions, Implement Permanent Corrective Actions, Prevent Recurrence, and Congratulate the Team. A text area for "Recognize Team Description" contains the text "Team commended via e-mail to company." Below this is a "Completed By" dropdown menu set to "USER, FRANK", a "Completed Date" field set to "Aug 6 2015", and a "Time" field set to "03:04 PM". At the bottom, there is a table for "FRB Approved By" with columns for Reviewer Name, Category, and Sign-off Date. A callout box labeled "Closed status" points to a dropdown menu with the following options: 09: Closed - Resolved, 10: Closed - Unresolved, and 11: Closed - Enhancement Requested.

Close the problem

Closed status

Closure Requested

Owner: NAME, USER
Priority: High
Last Occurrence: 07/28/2015

Creator: NAME, USER
Process Status: Congratulate the Team
Expected Closure Date: 08/27/2015

Created Date: 07/28/2015
First Occurrence: 07/23/2015

- Establish the Team
- Describe the Problem
- Implement and Verify Containment Actions
- Identify and Verify Root Cause
- Choose and Verify Permanent Corrective Actions
- Implement Permanent Corrective Actions
- Prevent Recurrence
- Congratulate the Team

Recognize Team Description: Team commended via e-mail to company.

Completed By: USER, FRANK

Completed Date: Aug 6 2015 Time: 03:04 PM Local Time

FRB Approved By:	Reviewer Name	Category	Sign-off Date
Edit Reviewer List	N/A		

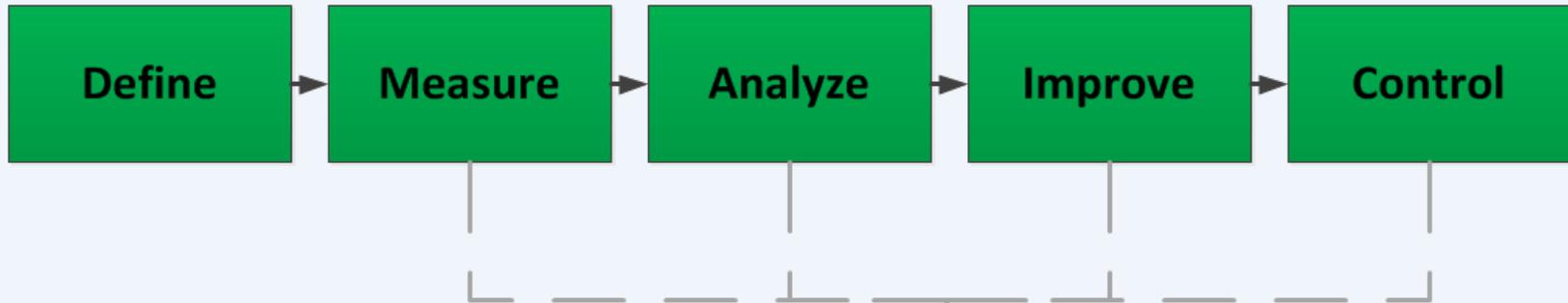
Set Close Status

- 09: Closed - Resolved
- 10: Closed - Unresolved
- 11: Closed - Enhancement Requested

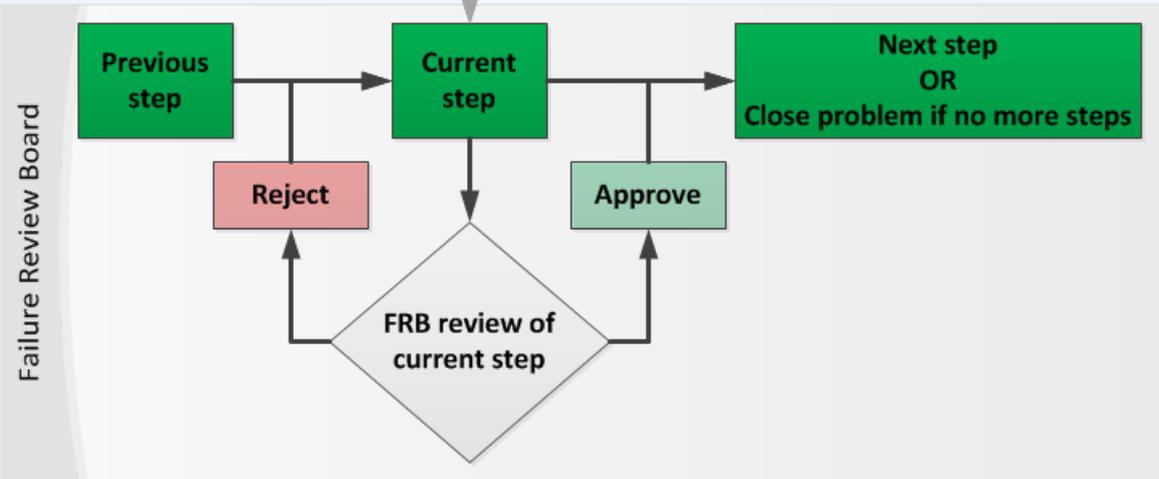
SOLVING PROBLEMS

- ⦿ The following slides show alternative problem resolution methodologies

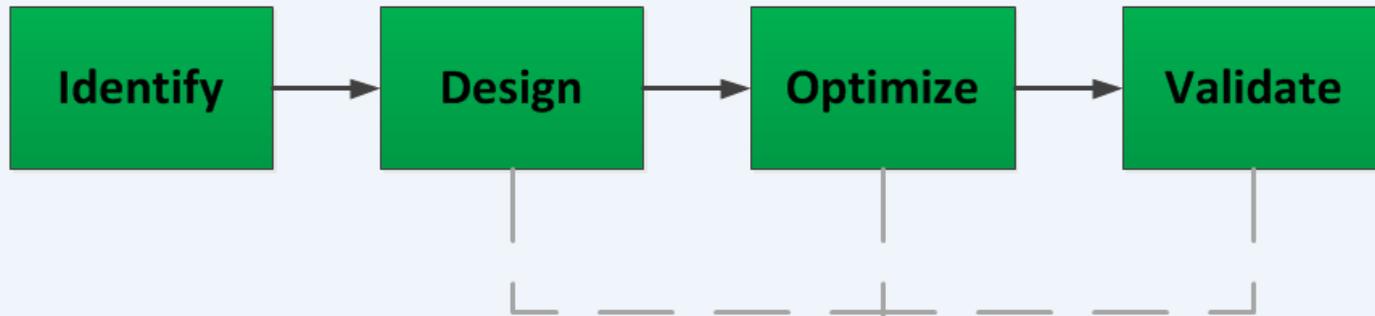
PROBLEM RESOLUTION PROCESS - DMAIC



- During any step, you can attach documents, such as:
- Technical service bulletin (TSB)
 - Engineering change notice (ECN – design, retrofit)
 - Quality control report (QCR)
 - Supplier deviation request/corrective action request (SCAR)
 - etc...

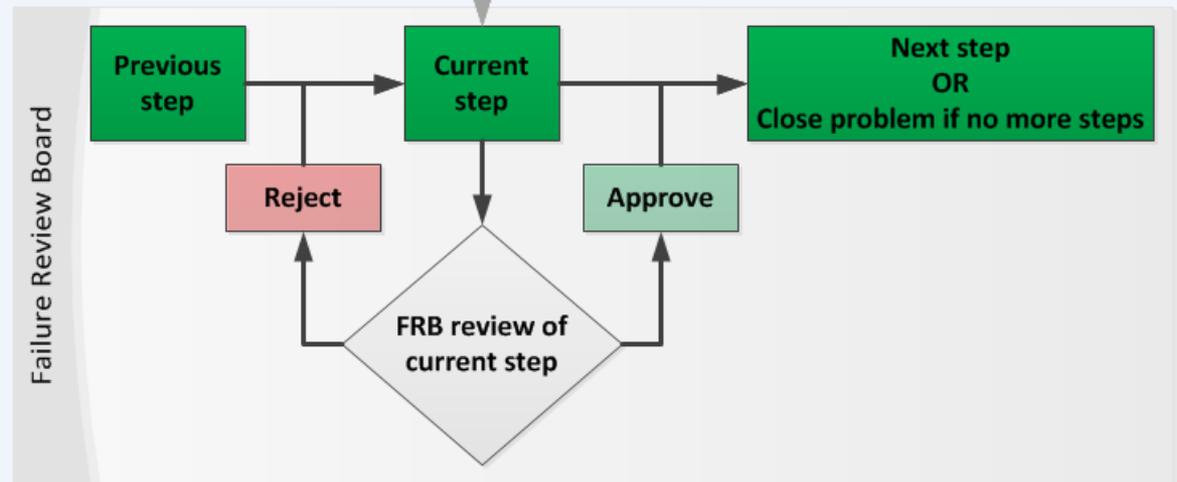


PROBLEM RESOLUTION PROCESS - IDOV



During any step, you can attach documents, such as:

- Technical service bulletin (TSB)
- Engineering change notice (ECN – design, retrofit)
- Quality control report (QCR)
- Supplier deviation request/ corrective action request (SCAR)
- etc...



Not Just FRACAS

Additional Interfaces to Address
Other Facets

ADDITIONAL INTERFACES

- ◎ **XFRACAS is designed to cover all facets of the incident and problem resolution process over the entire life cycle of your product, including:**
 - Failure analysis (FA) information on returned parts
 - Complete customer/vendor contact information
 - Incident histories
 - Installation details
 - System configuration information
 - And other functionality

CUSTOMER MANAGEMENT

- You can view complete customer information for deployed systems from multiple interfaces while trying to resolve an incident or a problem, or during the initial incident creation. This provides an at-a-glance view of:
 - Customer contact information
 - Installation details
 - Customer incident history
 - Etc.

MANAGE CUSTOMERS AND SUPPORT ISSUES

By customer and system:

- Installation location information
- System incident history
- System configuration
- Incidents associated with customer
- System health metrics
- Etc.

The screenshot displays the XFRACAS web application interface. The browser title is 'ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer'. The URL is 'http://xfracas/CSI.aspx'. The application has a navigation menu with options: Home, System, Admin, Options. Below the menu are icons for various functions: XFRACAS, SEP, Reports, Charts, Dashboard, Incident, Problem, Project, Customer Support, Save, Print Preview, Duplicate, Export, E-mail URL, Copy URL, Delete.

The main content area is titled 'ACME-1 | Company B - Company B Tucson Plant'. It displays various system metrics and configuration details:

- Shipment Date:** N/A
- Commission Date:** 08/03/2015
- Decommission Date:** N/A
- Delivery Date:** N/A
- Location:** Company B Tucson Plant
- Distributor:** Distributor A
- Run Hrs / Starts / kW Hrs:** 850 / N/A / N/A
- Estimated System Hours:** 850
- System Status:** Running Needs Service
- System Configuration:**
 - SN: SN_Aa_System A A ver/vA
 - MTBF* / MTBFE*: 850 / 850
 - MTBI* / MTBIE*: 850 / 850
 - Operational Availability: 100.0000%
- MTBCF* / MTBCE*:** 850 / 850
- Chargeable Incidents:** 1
- System Downtime Hours:** 0
- Under Warranty:** Yes - Expires 08/03/2016
- MTBNCF* / MTBNCFE*:** 1226 / 1226
- Non-Chargeable Incidents:** 0

The 'Customer/Location Information' section shows:

- Unit Owner: Company B
- Location: Company B Tucson Plant
- Address: 34024 W Broadway, City: Tucson, State: , Zip: 85701, Country:
- Contact Name: Doe, Jonathan
- Contact Phone: 520-886-0410, Contact E-mail: jdoe@companyb.com, Contact Fax: 520-886-0399

The 'Warranty Information' section shows:

- Initial Warranty: Months from Shipment: 15, Warranty Type: To Distributor, Months from Commission: 12
- Extended Warranty: Months: , Terms:
- Purchase Date: Aug 2015, Time: AM PM, Local Time

The 'Incident History' section shows a table with one incident:

Incident #	Occur Date	Status	Description
ACME-1	07/23/2015	Open	Component A-1 failed.

Other sections include 'Replaced Parts', 'Installation Details', and 'Accessories'.

FAILURE ANALYSIS PAGE

Incident repair
and failure analysis

Original Part SN	Original Part Name	Orig Part #	Rev	Failure Analysis Report
	Failure Type	Part Disposition	Hours to Failure	
	Return Type	RMA Number - Rcvd	SO Number	
SN A.1a	Component A.1	A.1	vA.1	ACME-1
	Primary Failure	Scrap	850.00	
	Component Failure	N/A - N/A	N/A	

- XFRACAS also provides additional interfaces for failure analysis information for all parts removed/replaced during the incident disposition
- One or more failure analysis reports can be associated with each removal or replacement

ACME-1 - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

Home Systems Admin Options

XFRACAS SEP Reports Charts Dashboard Incident Problem Project Customer Support Save Print Preview Export

Portal View Create Customer Support Failure Analysis

USER NAME

Links

FA Creator: N/A, USSE FA Report Open Date: 08/15/2015 FA Report Close Date: N/A

Incident Report #: 5221 Incident Creator: N/A Occurrence Date: 07/27/2015 04:15 PM

System Part #: A System Serial #: 29 Aa System Part Description: System A

Incoming Part #: A.1 Incoming Serial #: N/A Incoming Part Description: Component A.1

RMA Number: N/A RMA Received Date: N/A Sales Order #: N/A

ADP Field Service Tech: N/A

Failure Analysis Information

Failure Type: Primary Failure FA Status: Open

Return Type: Component Failure

Associated Problem: Engine Does Not Have Full Power: ACME-1

Status: None

Associated Files: None

Actions: None

RMA #:

Date Received: Aug 2015 Time: 11:22 AM Local Time

Sales Order #:

Visual Inspection

Technician Name:

Date: Aug 2015 Time: 11:22 AM Local Time

Visual Inspection:

Fault History:

Initial Repairs / Comments

Technician Name:

Date: Aug 2015 Time: 11:22 AM Local Time

Initial Repairs / Comments:

Failure Mode (S):

Detailed Analysis

Technician Name:

Date: Aug 2015 Time: 11:22 AM Local Time

Detailed Analysis:

ATP / Burn-In

First Attempt

Technician Name:

Date: Aug 2015 Time: 11:22 AM Local Time

Test Duration:

Fault Description / Troubleshooting / Remarks:

Test Result:

Second Attempt

Request Work Order: No

SAP Item:

PROJECTS

- ◎ **Projects allow you to manage related problems, in much the same way that problems are used to manage related incidents. You can create actions to be performed at the project level, just as you can create actions for incidents and problems.**

Administrative Interfaces

Managing and Configuring the System

ADMINISTRATIVE INTERFACES

- ⦿ **Administrative interfaces allow you to configure XFRACAS to meet your particular needs**
- ⦿ **From the system administrative interfaces, the administrator can easily:**
 - Manage user accounts by adding/removing system users and editing their profiles and permission levels
 - A partial screen is shown next

MANAGE USERS (SAMPLE SCREEN)

Users - Acme Enterprises Proprietary and Confidential Information - Internet Explorer
 http://xfracas/admin/AdminUser.aspx

Home System Admin Options Action #

User Groups
 Applicants
 Active Directory Security

Manage
 Preferences
 Details
 Lists
 User Categories
 Action Categories
 Criticality Configure

Diagnostics
 Resource Editor
 Tools

Entities
 Import
 Report Viewer
 Create
 Users

USER NAME Acme Enterprises

Current Entity Users: 7
 Current System Users: 28
 Current Entities: 7
Days Remaining: 159

Select Name to Edit:

System Wide Information

First Name
 Middle Name
 Last Name
 Employee ID
 City State
 Country Time Zone Local Time
 Language
 E-Mail Address
 Login
 Retired User Account Yes No
 Account Expiration Date Aug Time: AM PM Local Time
[Entities](#) No Entities assigned

Acme Enterprises Information

Retired User Account Yes No
 Account Expiration Date Aug Time: AM PM Local Time
 Reporting Organization
 Reports To
[User Groups](#) No Groups assigned

Categories	
D2 Approver	<input type="radio"/> Yes <input checked="" type="radio"/> No
D3 Approver	<input type="radio"/> Yes <input checked="" type="radio"/> No
D4 Approver	<input type="radio"/> Yes <input checked="" type="radio"/> No
D5 Approver	<input type="radio"/> Yes <input checked="" type="radio"/> No

MAINTAIN/MANAGE OTHER DATA

- ⦿ **Maintain/manage contact and look-up information including:**
 - Contacts
 - Field repair people/technicians
 - Customers
 - Companies
 - Locations
 - Etc.
- ⦿ **A sample contact management screen is shown next**

MANAGE CONTACTS (SAMPLE SCREEN)

Contacts - Acme Enterprises Proprietary and Confidential Information - Internet Explorer
http://xfracas/admin/AdminContacts.aspx

Home System Admin Options Action #

User Groups, Applicants, Active Directory, Security, Manage, Preferences, Details, Lists, User Categories, Action Categories, Criticality, Diagnostics, Resource Editor, Tools, Entities, Import, Report Viewer, Save, New, Delete

USER NAME: Contacts Acme Enterprises

Contact: Contact, John

Contact

First Name: John MI:

Last Name: Contact

Company: ReliaSoft Corporation

Location: ReliaSoft Corporate Headquarters

Address: 1450 S. Eastside Loop City: Tucson
Address 2: State: Arizona
Zip: 85710-6703 Country: United States

Title:

Phone: 520-886-0410 Fax:

Cell/Pager: E-mail:

Category: Unit Contact External User ASP Field Tech

Contact Details

Certification Type: Certification Level:

Certification Renewal: Aug 2015 Time: 09:46 AM Local Time

DEFINE AND MANAGE PRODUCTS

- ⦿ **Define and manage product configuration templates and edit/create systems**
 - Unlimited part indenture level when defining systems (e.g., system, subsystem, subsystem... nth subsystem)
 - The following slide shows a system creation screen
- ⦿ **Alternatively, you can use XML templates to import the configuration (e.g., “Bill of Materials”) from your own product management system**

MANAGE SYSTEM CONFIGURATION TEMPLATES OR INDIVIDUAL SYSTEMS (SAMPLE SCREEN)

The screenshot displays the XFRACAS web application interface. The browser window title is "Serialized - Acme Enterprises Proprietary and Confidential Information - Internet Explorer". The address bar shows the URL "http://xfracas/admin/SystemSerialized.aspx". The application has a navigation menu with "Home", "System", "Admin", and "Options". Below the menu is a toolbar with icons for "Template", "Serialized", "Create System", and "Find System". A secondary toolbar contains actions: "Create Serialized", "Add Non-Serialized", "Add Existing Serialized", "Export", "Edit Serialized", "Delete Serialized", and "Disassociate".

The main content area is divided into two sections. The left section, titled "USER NAME" and "Serialized", shows a tree view of system components. The right section, titled "Information", displays details for a selected system.

System Tree View:

- System A: A ver.vA SN:SN Aa
 - Component A.1: A.1 ver.vA.1 SN:A.1b
 - Component A.2: A.2 ver.vA.2 SN:SN A.2a
 - Sub-System A.3: A.3 ver.vA.3 SN:SN A.3a
 - Component A.3.1: A.3.1 ver.vA.3.1 SN:SN A.3.1a
 - Sub-Component A.3.1.1: A.3.1.1 ver.vA.3.1.1 SN:SN A.3.1.1a
 - Sub-System A.4: A.4 ver.vA.4 SN:SN A.4a
 - Component A.4.1: A.4.1 ver.vA.4.1 SN:SN A.4.1a
 - Component A.4.1: A.4.1 ver.vA.4.1 SN:SN A.4.2a
 - Component A.1: A.1 ver.vA.1 SN:SN A.1a [07/23/2015]

DEFINE/ASSIGN RESPONSIBLE ENGINEERS FOR SYSTEMS, SUBSYSTEMS, ETC. (SAMPLE SCREENS)

The screenshot displays the XFRACAS web application interface. The browser window title is "Template - Acme Enterprises Proprietary and Confidential Information - Internet Explorer". The URL is "http://xfracas/admin/SystemTemplate.aspx". The page has a navigation menu with "Home", "System", "Admin", and "Options". Below the menu is a toolbar with icons for "Template", "Serialized", "Create Template", "Find Template", "Xfmea Import", "Create", "Associate", "Assign Owner", "Edit", "Disassociate", "Remove Owner", "Delete", "CC List", and "Export".

The main content area is divided into two sections. On the left, under the heading "USER NAME", there is a tree view showing a system hierarchy. The selected item is "Component A.4.2: A.4.2 ver.vA.4.2". On the right, under the heading "Template", there is a dropdown menu showing "Acme Enterprises".

The "Information" section on the right displays the following details for the selected part:

- Part Number: A.4.2
- Part Name: Component A.4.2
- Part Version: vA.4.2
- Retired Date:
- HID:
- Part ID:
- Level:
- System Pa:
- 0 Children
- Owner:
- CC List:

A modal dialog titled "Assign Template Part Owner" is open over the "Owner" field. The dialog shows the "Part" as "A.4.2 Component A.4.2 vA.4.2" and a list of users with "USER, FRANK" selected. The list includes:

- USER, ANN
- USER, BOB
- USER, CATHY
- USER, DAVID
- USER, ELLEN
- USER, FRANK

The dialog has "Save", "Cancel", and "Help" buttons at the bottom.

SET THE SYSTEM PREFERENCES AND CUSTOMIZE THE BEHAVIOR OF THE SYSTEM (SAMPLE SCREEN)

Acme Enterprises - Boolean Preferences:

Preference Name	Change Description/Setting
Action - Allow Setting Due Date Before Current Date	<input checked="" type="radio"/> True <input type="radio"/> False
Analysis - Fixed Daily Operating Hours	<input type="radio"/> True <input checked="" type="radio"/> False
Analysis - Weibull++ Export Rollup	<input type="radio"/> True <input checked="" type="radio"/> False
CSI - Commission Date Required	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Create Incident Link Transfers Hours from CSI	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display All Authorized Service Technicians	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display Calculated System Downtime	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display Chargeable Incident Count	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display CSI Wizard	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display Delivery Date	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display MTBCF	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display MTBF	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display MTBI	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display MTBNCF	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Display Non-Chargeable Incident Count	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Enable Operational Availability	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Extended Warranty Purchase Anytime	<input checked="" type="radio"/> True <input type="radio"/> False
CSI - Show All Unit Contact Names	<input checked="" type="radio"/> True <input type="radio"/> False
E-mail - Action Owner on Update	<input type="radio"/> True <input checked="" type="radio"/> False
E-mail - Action Status Update	<input checked="" type="radio"/> True <input type="radio"/> False
E-mail - Action Status Update Associated Owner Checked	<input type="radio"/> True <input checked="" type="radio"/> False
E-mail - Action Status Update Creator Checked	<input type="radio"/> True <input checked="" type="radio"/> False
E-mail - Action Status Update Team Checked	<input type="radio"/> True <input checked="" type="radio"/> False
E-mail - BCC Administrator on XFRACAS Data Sent	<input type="radio"/> True <input checked="" type="radio"/> False
E-mail - CC Incident Owner Action Due Date	<input checked="" type="radio"/> True <input type="radio"/> False
E-mail - CC Problem Owner Action Due Date	<input checked="" type="radio"/> True <input type="radio"/> False

SET FIELD NAMES AND DISPLAY/HIDE FIELDS (SAMPLE SCREENS)

Details - Acme Enterprises Proprietary and Confidential Information - Internet Explorer
http://xfracas/admin/AdminDetailFields.aspx

Home System Admin Options Action #

User Groups, Applicants, Active Directory, Manage, Preferences, Details, Lists, User Categories, Action Categories, Criticality, Diagnostics, Resource Editor, Entities, Import, Report Viewer

USER NAME Details **Acme Enterprises**

Action Fields
Company Fields
Contact Fields
CSI Fields

- * Build Designation: (Installation Details, 1) [Select List, Administrative Controlled]
- * Primary Application: (Installation Details, 2) [Select List, Administrative Controlled]
- * Mode of Operation: (Installation Details, 3) [Select List, Administrative Controlled]
- * Market Segment: (Installation Details, 4) [Select List, Administrative Controlled]
- * Modem Phone Number: (Installation Details, 5) [Alphanumeric Input Box]
- Associated Files: (Installation Details, 5) [Attachments Table]
- * IP Address: (Installation Details, 6) [Alphanumeric Input Box]
- * Status: (Installation Details, 7) [Status]
- * Accessories: (Accessories, 1) [Accessory]

System Type: (Installation Details, 1) [Select List, Administrative Controlled] **Add Space** **Delete Space**

Component: (Installation Details, 2) [Optional]

System Configuration: (Installation Details, 3) [Optional]

Fuel Type: (Installation Details, 4) [Optional]

Edit Delete

FA Fields
Incident Fields
Location Fields
Part Fields
Problem Fields
Project Fields

CSI Detail Field

Detail Settings for Selected Entities

Section: [Installation Details]

Field Type: [Select List, Administrative Controlled]

Field Name: [System Type] Optional Required

Field Description: [System Type]

Display Order: [1] Span width of page

Default Value: [N/A]

Existing Dropdown: CSI/Problem - System Type Allow User Creation

Read-only: []

Add or Remove Entities

Acme Enterprises
Globex Ltd.
Initech Corp.

(1/3 selected) Available Entities

Cancel Help

MAINTAIN LISTS USED TO PROVIDE SELECTION OPTIONS IN USER INTERFACES (SAMPLE SCREEN)

Lookup Lists - Acme Enterprises Proprietary and Confidential Information - Internet Explorer

http://xfracas/admin/AdminLookupList.aspx

Home System Admin Options

Users: User Groups, Applicants, Active Directory, Security

Manage: Manage, Preferences, Details, Lists, Configure

User Categories, Action Categories, Criticality

Diagnostics, Resource Editor, Tools

Entities, Import, Report Viewer

USER NAME: Lookup Lists (Acme Enterprises)

- Company Sales Region
- Course Certification Level
- Course Certification Type
- CSI Detail - Build Designation
- CSI Detail - Market Segment
- CSI Detail - Mode of Operation
- CSI Detail - Primary Application
- CSI Extended Warranty Terms
- CSI/Problem - Component
- CSI/Problem - Fuel Type
- CSI/Problem - System Configuration
- CSI/Problem - System Type
- Currency Type
- FA ATP Test Result
- FA Customer Return Type
- FA Status

Name: FA Status Display: Description

Sort By: Code Asc Desc

Save Export

Description	Code/Name	Default/Retired Dt
- Open	1	
- Suspended	2	
- Pending	3	

[More Issues](#)

MODIFY OR ALTER THE STEPS IN THE 8D PROCESS (SAMPLE SCREEN)

Home System Admin Options Action #

User Groups Applicants Active Directory Users Security

Manage Preferences Details Lists User Categories Action Categories Criticality Tools Preferences

USER NAME Preferences Acme Enterprises

Problem - Display Incidents by Chargeability	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Display Incidents by Status	<input type="radio"/> True <input checked="" type="radio"/> False
Problem - Display Requested Closure Date	<input type="radio"/> True <input checked="" type="radio"/> False
Problem - Show Step - Implement and Verify Containment Actions	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Show Step - Identify and Verify Root Cause	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Show Step - Implement Permanent Corrective Actions	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Show Step - Congratulate the Team	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Display Team Members	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - Enable Created Date Restriction	<input checked="" type="radio"/> True <input type="radio"/> False
Problem - FRB Sign-Off CC Restriction	<input type="radio"/> True <input checked="" type="radio"/> False
Problem - FRB Sign-Off Restriction	<input type="radio"/> True <input checked="" type="radio"/> False
Project - Closure Restriction Level 1	<input type="radio"/> True <input checked="" type="radio"/> False
Project - Closure Restriction Level 2	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Actual Completion Date	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Associated Incidents	<input type="radio"/> True <input checked="" type="radio"/> False
Project - Display End Result	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Revised Completion Date	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Scope of Project	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Target Completion Date	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Display Team Members	<input checked="" type="radio"/> True <input type="radio"/> False
Project - Show Associated FA Reports	<input checked="" type="radio"/> True <input type="radio"/> False

Choose which problem steps are shown

Home System Admin Options Action #

User Groups Applicants Active Directory Users Security

Manage Preferences Details Lists User Categories Action Categories Criticality Tools Preferences

USER NAME Preferences Acme Enterprises

System-Wide Preferences

Acme Enterprises - Boolean Preferences:

Acme Enterprises - Date Preferences:

Acme Enterprises - Display Option Preferences:

Preference Name	Change Description/Setting
Incident - Display Part Incident Type	Not Displayed
Incident - Display Serialized Incident Type	Displayed (Default)
Incident - Display Simple Incident Type	Not Displayed
Problem - Display FRB - Describe the Problem	Not Displayed
Problem - Display FRB - Implement and Verify Containment Actions	Displayed
Problem - Display FRB - Identify and Verify Root Cause	Displayed
Problem - Display FRB - Choose and Verify Permanent Corrective Actions	Displayed
Problem - Display FRB - Implement Permanent Corrective Actions	Displayed
Problem - Display FRB - Prevent Recurrence	
Problem - Display FRB - Congratulate the Team	
XFRACAS - Language	
XFRACAS - Skin	Standard

Acme Enterprises - E-mail Preferences:

Acme Enterprises - Integer Preferences:

Hide, display or require an FRB for each step

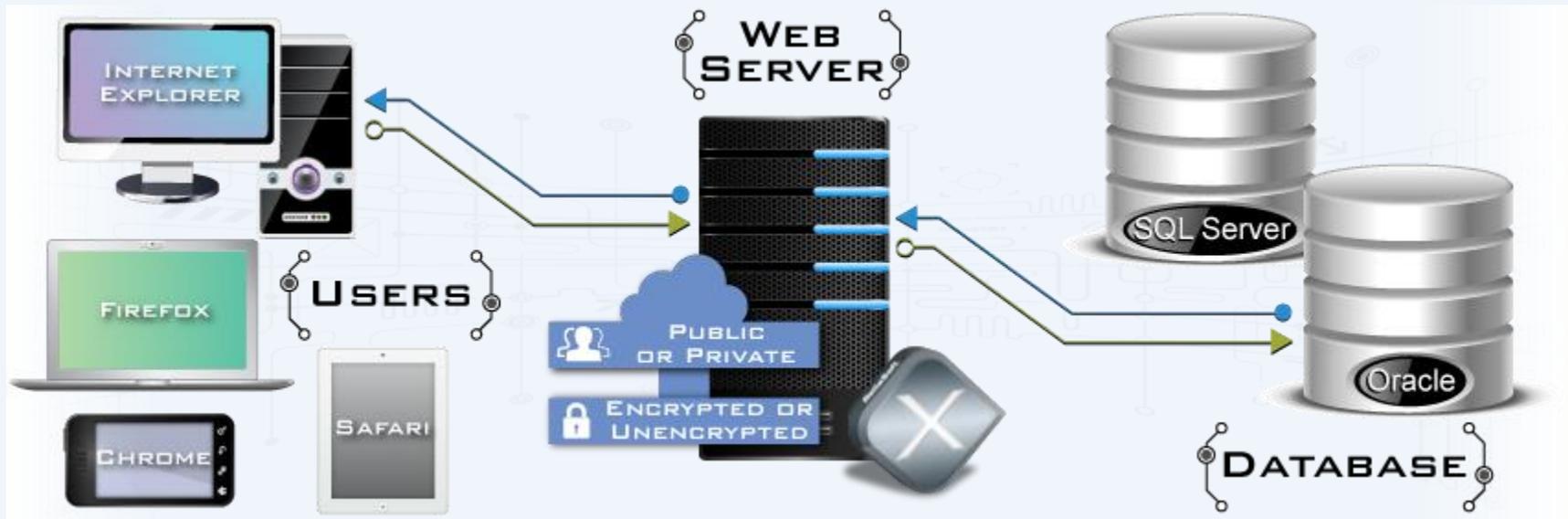
System Architecture

Scalable, Robust Web-based System

SCALABLE, ROBUST SYSTEM ARCHITECTURE

- ⦿ ReliaSoft's FRACAS system has been designed as a web-based system to serve the needs of large organizations
- ⦿ XFRACAS is based on the .NET Framework. It is:
 - n-tier
 - Scalable
 - Distributable
 - Robust
 - Able to be deployed across multiple servers or on a single box

ARCHITECTURE



ARCHITECTURE

⦿ Server Requirements:

- Windows 2008 R2 or newer
- .NET 4.0
- IIS with support for serving ASP.NET
- SQL Server 2005 or newer OR Oracle 10g or newer(32-bit and 64-bit versions of all, full version only)

⦿ Client Requirements (System Users):

XFRACAS is compatible with any browser that supports the following doctype:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"  
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

This includes Internet Explorer, Chrome, Firefox or Safari residing on a Windows operating system, a Mac operating system or even a tablet (such as iOS, Android, etc.)

Advanced Reliability Analysis

Direct Integration with ReliaSoft's
Desktop Applications

ADVANCED RELIABILITY ANALYSIS

- ◎ The rigor and diligence used during the incident reporting and subsequent problem resolution process result in clean, usable data that can be directly integrated with ReliaSoft's advanced analysis tools
 - Life data analysis, reliability growth analysis and management, warranty forecasting, maintenance optimization, reliability allocation, etc...



SYNTHESIS DATA WAREHOUSE (SDW)

- Extract XFRACAS data into the Synthesis Data Warehouse for direct analysis in Weibull++, ALTA or RGA.
 - Results from these analyses can be used in other Synthesis desktop applications.
- Customize and save XFRACAS reports as data sources in the SDW. Create custom dashboards to fit your specific needs.

The screenshot displays the Synthesis Data Warehouse (SDW) interface. The left pane shows the 'Data Source Manager' with a tree view of data sources including 'Weibull++/ALTA Data' and 'RGA Data (2)'. The main pane shows a table of data sources with columns for 'Include in Analysis?', 'PartName', 'StateTime', and 'StateFS'. The right pane shows a 'Dashboard' with several charts:

- Failure & Suspension Count:** A stacked bar chart showing counts for Composite Frame, FL Bulb and Socket, Fluorescent Bulb, and Socket.
- Failure Modes Observed:** A pie chart showing the distribution of failure modes: Aging and Stress (57.03%), Chattering (0.39%), Filament burns (10.65%), Frame Bend (5.56%), Plastic Casing Cracked (18.05%), and Wiring snapped during installation (0.32%).
- Failures by Part Number:** Two gauge charts for part numbers BS3 (6,189) and FL1 (8,259).
- Count by Root Cause:** A bar chart showing counts for various root causes: Evaporates during use, Installation issue, Installer hung only by wires without any support, Sun Exposure, and Swinging and looser wires.

The XFRACAS logo is visible in the bottom left corner.

RELIABILITY GROWTH EXAMPLE

- Bring data from XFRACAS into RGA in order to:
 - Create equivalent system and analyze growth, compute reliability metrics, etc.
 - Determine optimum overhaul times, etc.

Reparable System Analysis

F-RS	Time to Event (Hr)	Comment 1
1	0	Start
2	1268	End
3	68	
4	1137	
5	1167	
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Main

STANDARD FOLIO

Model: Power Law

Fielded Repairable

MLE Crow

User Modified Results

Results

Parameters

Beta: 1.7743

Lambda (Hr): 2.5580E-06

Statistical Tests

Significance Level: 0.1

CVM: Passed

CBH: Not available

Other

Termination Time (Hr): 1593.0000

Systems: 11/11

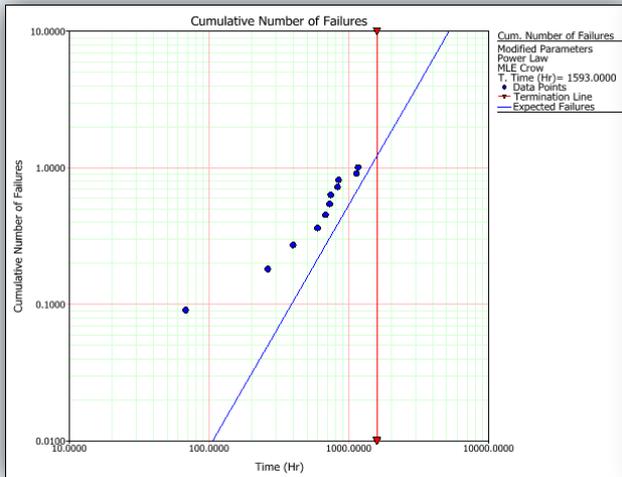
Individual System Results

System 1

Beta: 0.9622

Lambda (Hr): 0.0031

CVM: Failed



QCP

Reparable System Analysis/Modified Parameters

Optimum O... 3228.7046

Optimum Overhaul Hr No Bounds Captions On

QUICK CALCULATION PAD Units Bounds Options

Reliability

Prob. of Failure

Cumulative MTBF

Failure Intensity

Instantaneous MTBF

Failure Intensity

Time Given:

Cumulative MTBF

Repairable Mission Time (Hr)

Optimum Overhaul

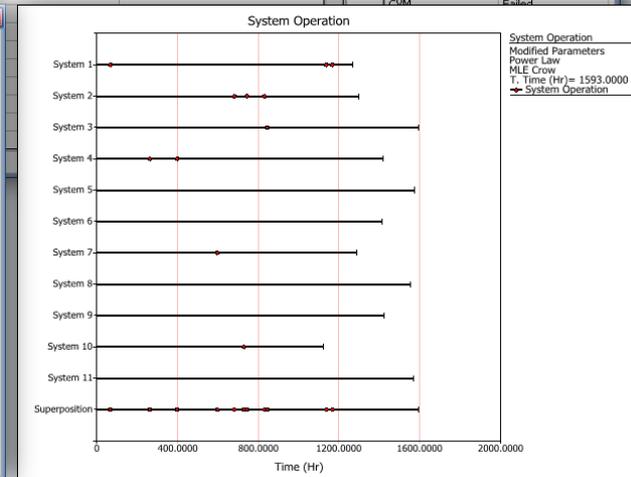
Failures Number of Failures

Input

Repair Cost: 3000

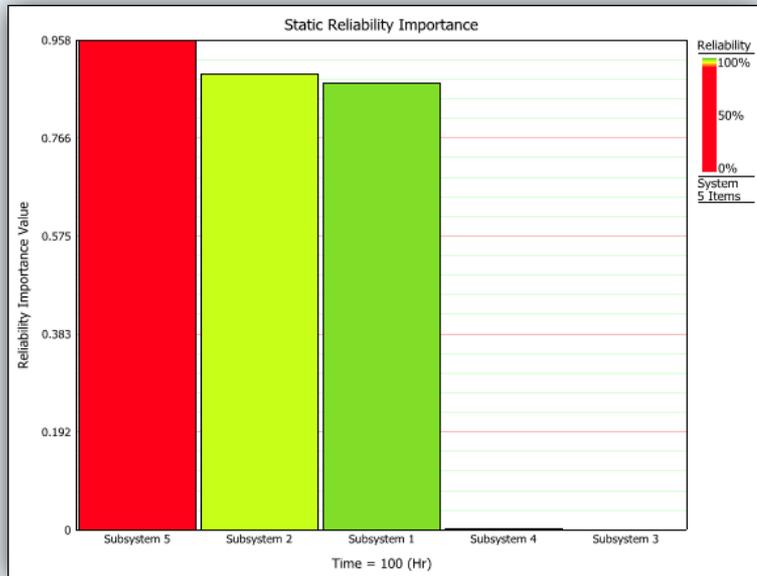
Overhaul Cost: 10000

Calculate Report Close



SYSTEM RELIABILITY EXAMPLE

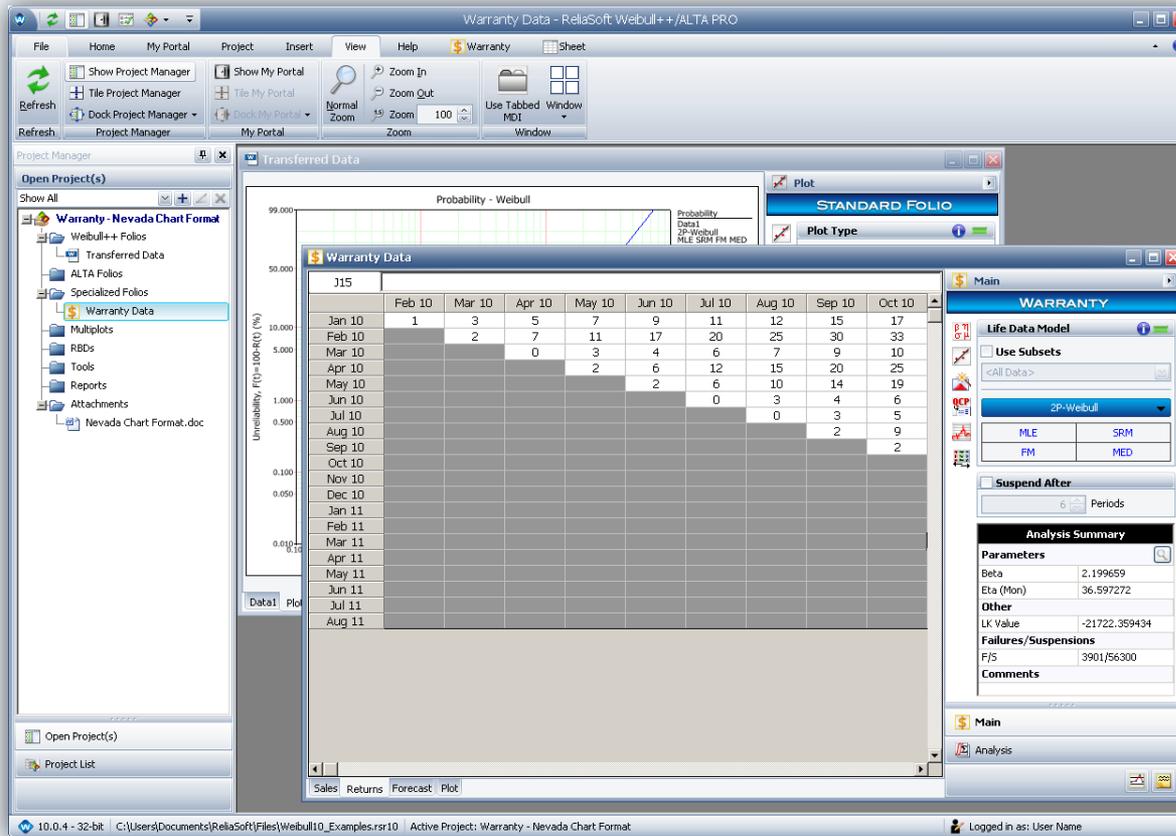
- Hone in on issues
 - Use Weibull++ and BlockSim to model, analyze and study the system and its components



	Last Inspected (Hr)	State F or S	Time to F or S (Hr)	Subset ID 1
1	33.3747	F	33.3747	
2	36.0766	F	36.0766	
3	66.3915	F	66.3915	
4	102.4747	S	102.4747	
5	212.9023	S	212.9023	
6	534.1681	F	534.1681	
7	590.6515	S	590.6515	
8	648.3596	S	648.3596	
9	653.4834	S	653.4834	
10	444.1957	F	689.7185	
11	708.3724	S	708.3724	

LIFE DATA ANALYSIS EXAMPLE

- Perform warranty analysis and warranty forecasts, and monitor trends



ANALYSIS OPTIONS DEPEND ON THE DATA

- ⦿ **Depending on how XFRACAS is configured and how you choose to process incidents, different analysis options will be available**
 - For example, if the system and data entry are based on fully serialized systems, then complete time-to-failure data by system, subsystem and component will be available for in-depth analysis

VIEW DATA IN THE SYNTHESIS ENTERPRISE PORTAL

- If your organization has implemented the Synthesis Enterprise Portal (SEP), those users will be able to view the SDW dashboards from any web-enabled device, even if they don't have direct access to XFRACAS. The SEP also provides a link to the XFRACAS site for users who have access to both.

ReliaSoft SEP - SDW Dashboards - Internet Explorer

http://SEP/SDW/Index

THE SYNTHESIS ENTERPRISE PORTAL

XFRACAS User Preferences

SEP Metrics Dashboards Spreadsheets Projects Messages Actions Users Synthesis

Home My Views Work Items Repository

Save URL E-mail URL Copy URL

My Quick Links

Select Data Sources

- SDW
 - Weibull++ /ALTA Data
 - Chandler
 - RGA Data
 - Custom Connections

Synthesis Data Warehouse Synthesis Explorer

Dashboards SDW Dashboard View in full screen Share

SDW - Incident Information

Incident Count - Drill Down by Part Name, Category and Report Type

Fluorescent Bulb: 3 (60.00%)

Wiring: 2 (40.00%)

Failure Modes

FailureMode (Count)

Bulb Failed No Power No Light Sparking

Current Selection by Root Cause

Root Cause

Environment ... Age: 1 (20.00%)

Incorrect Ins... Wiring Crimped...

Poor Insulation...

Incidents

Inciden...	Part Name	State Time
MSC1	Wiring	1K
MSC2	Wiring	1.5K
MSC3	Fluorescent Bulb	850
MSC4	Fluorescent Bulb	1.9K

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EMPOWERING THE RELIABILITY PROFESSIONAL



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EDUCATION TO EMPOWER
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CONSULTING TO EMPOWER
THE RELIABILITY PROFESSIONAL

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