

# ReliaSoft XFRACAS by HBM Prenscia

Highly configurable, web-based, enterprise-wide  
FRACAS system

***ReliaSoft***



**XFRACAS**

# What is XFRACAS?

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- Enterprise system for incident/failure reporting and team-based problem resolution
- Web-based for easy access, collaboration and deployment across multiple sites, suppliers and customers
- Highly configurable to fit your organization's specific processes
- Builds a "knowledge base" of lessons learned that can be shared throughout the organization
- Captures data for reliability, quality, safety, risk management and other analyses
- Flexible, scalable and able to grow with your needs

# XFRACAS is a Complete System

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- Incident Reporting and Failure Analysis
  - Report and troubleshoot issues from multiple locations, suppliers, dealers
  - Capture findings from failure analysis on returned parts
- Team-Based Problem Resolution and Root Cause Analysis
  - Track any problem resolution method from 4 – 8 steps
  - Capture findings from root cause analysis
- Action Tracking and Project Management
  - Assign actions, send notifications, track completion
  - Manage related problems together and monitor key metrics
- Part Tracking for Serialized Systems
  - Configuration tracking for serialized systems
  - History of incidents and repairs/replacements
- Reports, Charts and Dashboards
- Captures Data for Reliability Analysis

# XFRACAS is Highly Configurable

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- Extensive options to configure the interface to meet your needs
  - Turn features on or off, control how they behave
  - Rename data fields and even create your own
  - Set requirements for data input
    - choose field type, customize drop-down lists
  - Each “entity” has its own settings and permissions
- Supports many different types of processes
  - FRACAS / CAPA
  - Safety management
  - Risk reduction
  - Quality tracking (non-conformance)

# Assigning Incidents to Problems

# Failure Reporting + Problem Resolution

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- XFRACAS innovatively bridges the gap between your organization's activities for:
  - Incident / failure reporting
  - Problem resolution / root cause analysis
- Provides all the tools you need to “close the loop” on each reported incident
- Also facilitates more in-depth analysis and team-based problem resolution for broader underlying issues
- In XFRACAS terminology, this involves “incidents” and “problems”

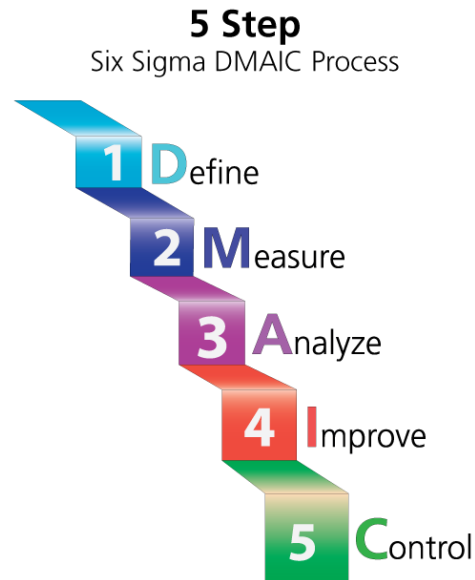
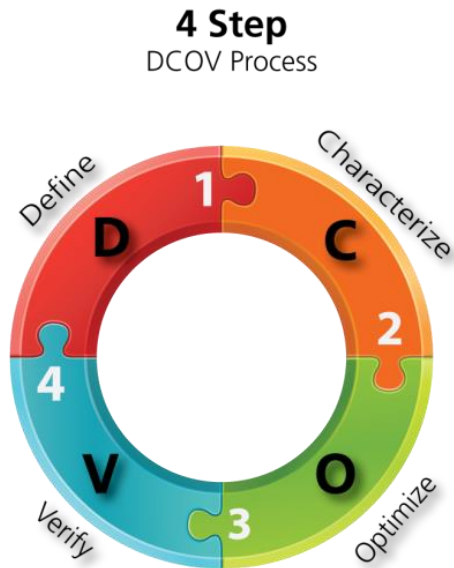
# Incidents

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- An “incident” is a failure, suggestion or other issue found during testing, reported by a customer, etc.
- Each incident deals with a single instance of an issue so you can track how it was addressed
  - What happened?
  - Which part(s) failed?
  - What did you do to get the system up and running again?
  - ...
- Sometimes there are multiple incidents that are all due to the same underlying issue

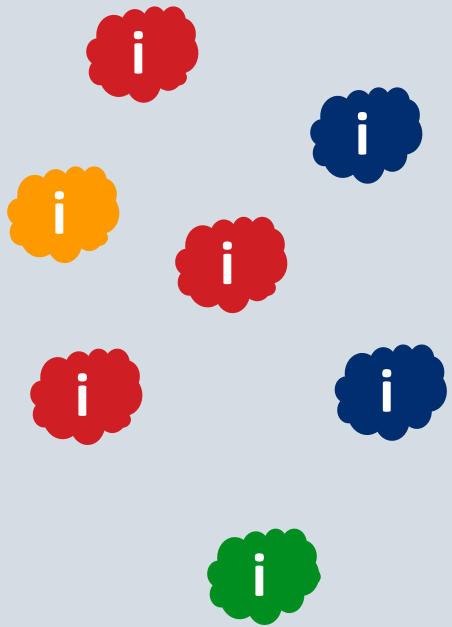
# Problems

- A “problem” is a larger issue that may require a team-based approach to analyze and resolve
  - Assign multiple incidents to the same problem
  - Use any problem resolution methodology from 4 to 8 steps

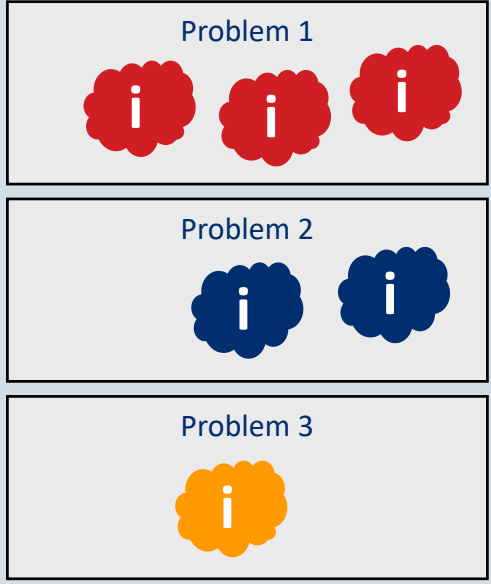


# Assigning Incidents to Problems

Incidents are reported and may be addressed as they occur



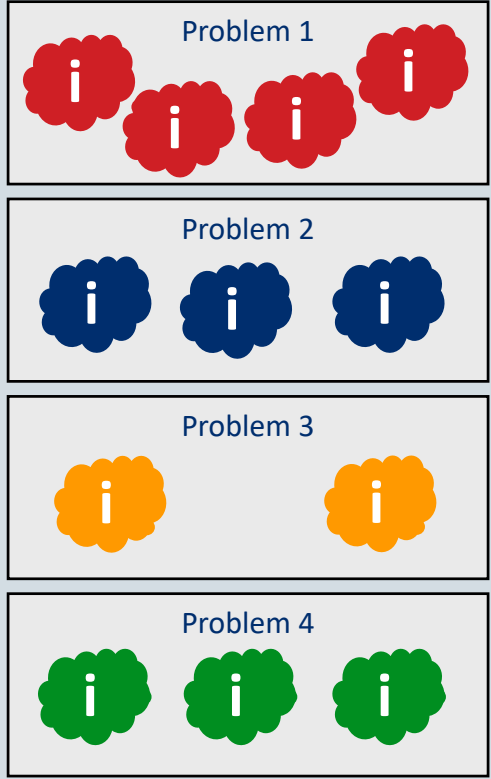
Some incidents are assigned to problems...

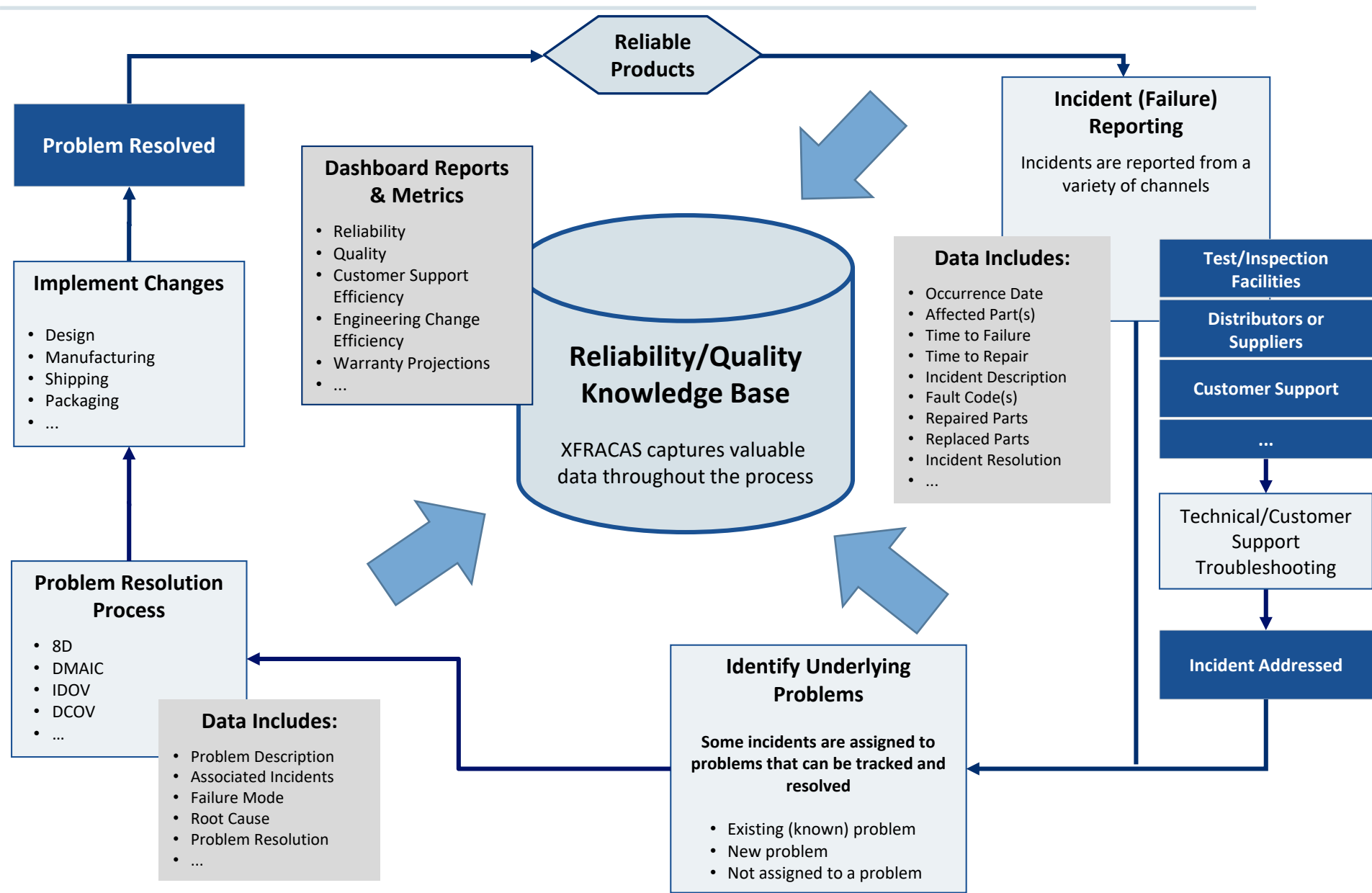


...Others are not



New problems may be identified as new incidents are reported





# XFRACAS Architecture

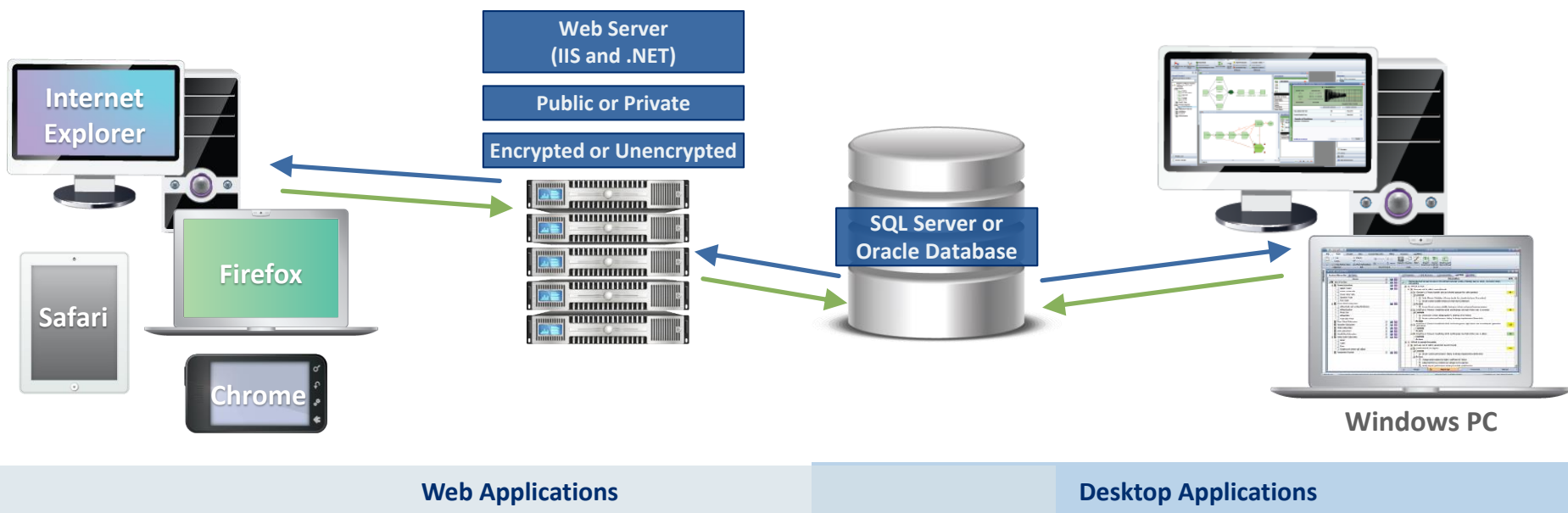
# Web-based, Scalable and Robust

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- XFRACAS is based on the .NET Framework
  - n-tier
  - Scalable
  - Distributable
  - Robust
  - Able to be deployed across multiple servers or on a single box
- Windows Authentication or Single Sign-On (SSO)
- Public or private
- Encrypted or unencrypted
- Access from web browser — no client installation

# Architecture

- ReliaSoft desktop applications, XFRACAS and the Synthesis Enterprise Portal (SEP) can all connect with the same data repository on either SQL Server or Oracle



# Server and Client Requirements

- **Server Requirements**

If you plan to host the database and website on the same server:

- Windows 2008 R2 or newer
- .NET 4.6
- IIS with support for serving ASP.NET
- SQL Server 2008 or newer OR Oracle 10g or newer (32-bit and 64-bit versions of all, full version only)

- **Client Requirements**

Users can access the website 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.)

# Personalized Portal

# Personalized Portal

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- Customizable, at-a-glance view of all the issues you need to work on, such as:
  - Actions you need to complete
  - Incidents, Problems or Projects you need to work on
  - Problem steps you need to review and sign off
  - ...
- Global or local announcements and links
- Links to saved custom reports
- Option to have a report run automatically when you visit this page

(YOU CAN CUSTOMIZE TO FIT YOUR NEEDS)

USER NAME

Portal Entity 1

### Links

Reports

- [Incidents Created by Me](#)
- [Incidents Submitted for Testing](#)

External Links

- [Company Home Page](#)

### Announcements

System Update from USER NAME

The system will be updated on Saturday at 9:00. Please plan accordingly.

### Tasks

Uncompleted Actions (1) 0 are due

| Action #           | Associated #               | Action Description          | Due Date   |
|--------------------|----------------------------|-----------------------------|------------|
| <a href="#">14</a> | INC: <a href="#">E1-21</a> | Replace the mounting plate. | 07/26/2013 |

Unclosed Incidents (10)

| Incident #            | Status       | Description             | Occur. Date |
|-----------------------|--------------|-------------------------|-------------|
| <a href="#">E1-17</a> | Open         | Fused Plug              | 07/18/2013  |
| <a href="#">E1-18</a> | Under Review | Cracked Case            | 07/18/2013  |
| <a href="#">E1-16</a> | Under Review | Cracked Support Bracket | 07/18/2013  |

Open Problems (0) 0 are due

| Problem #                 | Status | Problem Title | Req Date |
|---------------------------|--------|---------------|----------|
| You have no Problems due. |        |               |          |

Problems To Review (1) 0 are due

| Problem #            | Status | Problem Title                              | Problem Owner | Req Date   |
|----------------------|--------|--|---------------|------------|
| <a href="#">E1-4</a> | 03A    | Support brackets crack at connection point | CATHY USER    | 09/30/2013 |

My Projects (1)

| Project #            | Title           | Req Date   |
|----------------------|-----------------|------------|
| <a href="#">E1-1</a> | System A Issues | 05/24/2014 |

# Incidents and Failure Analysis

# XFRACAS Incidents

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- Captures data to understand, categorize and address each incident, such as:
  - Description of the incident
  - Date/time of occurrence
  - Responsible part, fault code, failure mode
  - How the incident was addressed
  - Is this a “chargeable failure” for reliability analysis?
- For a serialized system, you can also capture:
  - Complete history of incidents and repaired/replaced parts for that system
  - Time/usage (run hours, cycles) when each incident occurred — for reliability data analysis

# Incident Page

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**E1-21 | Fused Plug** Entity 1

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**Assigned to Problem#**   
N/A

**System Configuration:**  
[SN:SN A2, System A](#)

**Owner:**  
USER, FRANK

**Incident Category:**  
Component Failure

**Downtime for Service:**  
N/A

**Occurrence Date:**  
07/17/2013 02:34 PM

**System Status:**  
Running Needs Service

**Reporting Date:**  
07/18/2013 02:36 PM

**Responsible Part:**  
A.3.1: Component A.3.1

**Response Time:**  
24 hours

**Incident Status:**  
Open

**Run Hrs / Starts / kW Hrs:**  
[1500 / N/A / N/A](#)

**Creator, Reporting Org:**  
USER NAME, N/A

**Unit Location:**  
N/A

**System/Component Information**

**Incident Disposition**

Incident Title:

Incident Occurrence Date:      AM  PM

Incident Status:

Report Type:

Incident Category:

Responsible Part:

Assign To:

Creator:

Actions:

| Action Number      | Short Description           | Due Date   | Owner      |
|--------------------|-----------------------------|------------|------------|
| <a href="#">14</a> | Replace the mounting plate. | 08/01/2013 | NAME, USER |

Description of Incident:

**Incident Repair Information**

# Failure Analysis for Replaced Parts

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- When applicable, capture more detailed findings for parts that were removed/replaced and returned for failure analysis, such as:
  - RMA #, sales order#, work order #
  - Visual inspection
  - Fault history
  - Initial repairs
  - Detailed analysis
  - ATP/burn-in test results
  - ...

# Failure Analysis Page

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● E1-3
Entity 1

|   |   |  |
|---|---|--|
| <b>FA Creator:</b><br><a href="#">NAME, USER</a><br><b>Incident Report #:</b><br><a href="#">E1-23</a><br><b>System Part #:</b><br><a href="#">A</a><br><b>Incoming Part #:</b><br><a href="#">A.1</a><br><b>ASP Field Service Tech:</b><br><a href="#">N/A</a> | <b>FA Report Open Date:</b><br><a href="#">07/18/2013</a><br><b>Incident Creator:</b><br><a href="#">USER NAME</a><br><b>System Serial #:</b><br><a href="#">SN A2</a><br><b>Incoming Serial #:</b><br><a href="#">SN CA1-1</a><br><b>Customer Requests Feedback:</b><br><a href="#">No</a> | <b>FA Report Close Date:</b><br><a href="#">N/A</a><br><b>Occurrence Date:</b><br><a href="#">07/18/2013 03:32 PM</a><br><b>System Part Description:</b><br><a href="#">System A</a><br><b>Incoming Part Description:</b><br><a href="#">Component A.1</a><br><b>Associated Problem:</b><br><a href="#">E1-7</a> |
|---|---|--|

**▲ Failure Analysis Information**

|  |  |
|--|--|
| Failure Type: <input type="text" value="Primary Failure"/>               | FA Status: <input type="text" value="Open"/> |
| Return Type: <input type="text" value="Component Failure"/>              |  |
| Associated Problem: <input type="text" value="Overheating Plugs: E1-7"/> |  |

| Status: | Status Date         | Written by | Description  |   |
|---------|---------------------|------------|--|---|
|         | 07/18/2013 03:39 PM | NAME, USER | Currently testing to determine cause of overheating. | + |

|   |   |
|---|---|
| Associated Files: <input type="text" value="None"/> | + |
| Actions: <input type="text" value="None"/>          | + |
| RMA #: <input type="text"/>                         |   |

Date Received:     AM  PM

**▼ Failed Component System Information**

**▼ Visual Inspection**

**▼ Initial Repairs / Comments**

**▼ Detailed Analysis**

**▼ ATP / Burn-In**

**▼ SAP Items**

# Problem Resolution and Root Cause Analysis

# XFRACAS Problems

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- Describes the problem and links to all related incident reports
- Tracks the team's efforts for root cause analysis and problem resolution
- Can be configured for any method, from 4 – 8 steps
  - 8 Disciplines (8D)
  - Six Sigma DMAIC
  - DCOV
  - ...
- Tracks the completion of assigned actions
- Tracks review and sign-off by Failure Review Board (FRB)

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● **E1-4 | Support brackets crack at connection point** Entity 1

**Owner:**  
USER, CATHY

**Priority:**  
High

**First Occurrence:**  
N/A

**Creator:**  
NAME, USER

**Process Status:**  
05: Choose and Verify Permanent Corrective Actions

**Last Occurrence:**  
N/A

**Created Date:**  
01/14/2010

**Requested Closure Date:**  
09/30/2013

**Expected Closure Date:**  
N/A

- ▼ 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

Corrective Action Description:

|   | Action NumberShort Description            | Due Date   | Owner     |
|---|---|------------|-----------|
| ▼ | 15 Send new brackets to existing custo... | 07/30/2013 | USER, ANN |

Completed By:

Completed Date:    Time:   AM  PM

**FRB Approved By:**  **Category:** D5 Approver **Sign-off Date:** Sign off:  Yes  No

# Action Tracking and Project Management

# XFRACAS Actions

- Throughout XFRACAS, you can assign actions to users and track the completion
- Option for automated e-mail notifications
- Option to assign other users or groups to receive notifications
- Multiple ways to track progress – reports, charts, dashboards

**New Action**

Action Type: Incident Incident Number: EMP-307  
Incident Owner: JILL ENGINEER

\*Assign to: RELIABLE, JOHN

\*Category: Incident Action

\*Due Date: Oct  6  2017

\*Description: Description of an action that needs to be performed.

- Group multiple problems together and track statistics such as:
  - What is the target completion date?
  - How many issues are open/closed?
  - How long has each issue been in the system?
  - Which issues are still open?
  - What is the status?
  - Who is responsible?
  - ...

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E1-1 | System A Issues
Entity 1

**Owner:**  
ANN USER

**Target Completion Date:**  
09/30/2013 10:30 AM

**Priority:**  
High

**Revised Completion Date:**  
N/A

**Project Start Date:**  
07/15/2013 09:30 AM

**Actual Completion Date:**  
N/A

▼ Project Information

▲ Associated Data

**Associated Problems** [Create a New Problem](#) [Assign/Remove Problems](#)

| Problem              | Problem Description   | Owner       | Status               | # of IRs | Last Occurrence | Cpt. Date |
|----------------------|---|-------------|----------------------|----------|-----------------|-----------|
| <a href="#">E1-3</a> | Cracks develop in external casing, allowing dust to enter the unit. | USER, BILL  | Describe the Problem | <u>1</u> | 07/18/2013      | N/A       |
| <a href="#">E1-4</a> | Support brackets crack at connection point                          | USER, CATHY | Develop Containment  | <u>1</u> | 07/18/2013      | N/A       |
| <a href="#">E1-7</a> | Plugs overheat and fuse to mounting plate.                          | USER, ANN   | Describe the Problem | <u>2</u> | 07/18/2013      | N/A       |

**Associated Incident Reports** [Hide/Display Associated Incidents](#)

|                          |                            |
|--------------------------|----------------------------|
| <b>Open Incidents: 4</b> | <b>Closed Incidents: 0</b> |
|--------------------------|----------------------------|

**Associated FA Reports**

| Problem              | FA Number            | Created Date | Closed Date | RMA | Root Cause  |
|----------------------|----------------------|--------------|-------------|-----|-------------|
| <a href="#">E1-7</a> | <a href="#">E1-3</a> | 07/18/2013   | N/A         | N/A | Overheating |

Associated Files:  +

# Reports, Charts and Dashboards

# XFRACAS Reports

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- Wide variety of tabular reports
  - Use built-in “standard” reports
  - Save and re-use your own custom templates
    - Columns displayed, filter criteria, sort order
  - Run your own custom SQL statements
- Results displayed in web browser
  - Filter and sort within the results
  - Export to \*.xlsx, \*.rtf, \*.csv, \*.pdf
  - Easy to link, “watch” and share with other users
- Option to output as XML, which can be used as a web-based data source for other tools (e.g., “Get External Data > From Web” in Excel)

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**Reports**
RELIASOFT MODEL DATABASE ▾

Standard Reports

My Reports

Public Reports

Administrator Reports

[Incident](#)  
Generate a report for Incidents based on the settings in the Report Builder for the current entity.

[Problem](#)  
Generate a report for Problems based on the settings in the Report Builder for the current entity.

[Action](#)  
Generate a report for Actions based on the settings in the Report Builder for the current entity.

[Attachment](#)  
Generate a report for Attachments based on the settings in the Report Builder for the current entity.

[CSI](#)  
Generate a report for Customer Support based on the settings in the Report Builder for the current entity.

[Project](#)  
Generate a report for Projects based on the settings in the Report Builder for the current entity.

pdf ▾
SQL

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

|   | Incident Number | Occurrence Date     | Category          | Creator    | Incident Owner |
|---|-----------------|---------------------|-------------------|------------|----------------|
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>Responsible Part ▾</span> <span>Incident Status ▾</span> </div>     |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[-] Responsible Part: C1: Chandelier</span> </div>                  |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[+] Incident Status: Closed</span> </div>                           |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[-] Incident Status: Open</span> </div>                             |                 |                     |                   |            |                |
|   | REL-18          | 04/30/2013 11:32 AM | Component Failure | BRIAN BULB | MIKE MANAGER   |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[+] Responsible Part: CCF: Chandelier Composite Frame</span> </div> |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[+] Responsible Part: CLED: Chandelier LED</span> </div>            |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[+] Responsible Part: FL1: Fluorescent Bulb</span> </div>           |                 |                     |                   |            |                |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <span>[+] Responsible Part: WR1: Wiring</span> </div>                     |                 |                     |                   |            |                |
| <a href="#">Create Filter</a>   |                 |                     |                   |            |                |

# XFRACAS Charts, Dashboards and XSLT

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- Pareto or trend charts for any set of results
  - Bar charts, pie charts, area charts, step charts, scatter charts, line charts
  - Highly customizable
  - Full drill-down capability
- Dashboards display multiple charts and/or tabular results together in a single display
  - Create your own custom layouts
  - Easy to share with other users
- For completely customized output, you can create your own XSLT style sheet for any set of results (Extensible Stylesheet Language Transformations)

# Dashboard Page

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Dashboard Designer

RELIASOFT MODEL DATABASE

Select a Dashboard Layout: Incident Dashboard

Select Number of Rows: 2

Select Number of Columns: 2

**Panel 1**

Select Report: Chart Reports | Incident

**Panel 2**

Select Report: My Chart Reports | Incident pie chart

| Incident Number | Occurrence Date | Incident Status | Responsible Part      | Category |
|-----------------|-----------------|-----------------|-----------------------|----------|
| REL-9           | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-10          | 4/29/2013       | Closed          | FRC1: Composite Frame | Compt    |
| REL-11          | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-12          | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-13          | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-14          | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-15          | 4/29/2013       | In-Progress     | FL1: Fluorescent Bulb | Compt    |
| REL-16          | 4/29/2013       | Closed          | FL1: Fluorescent Bulb | Compt    |
| REL-17          | 4/29/2013       | Closed          | WR1: Wiring           | Compt    |
| REL-18          | 4/30/2013       | Open            | C1: Chandelier        | Compt    |

**Panel 3**

Select Report: Standard Reports | Incident

| Category                 | Count | Percentage |
|--------------------------|-------|------------|
| Preventative Maintenance | 1909  | 33.33%     |
| Component Failure        | 1084  | 19.33%     |
| Installation Issue       | 1880  | 33.33%     |

Incident Pie

- C1: Chandelier: 33 %
- CCF: Chandelier Composite Frame: 33 %
- FRC1: Composite Frame: 0 %

Incident by category

| Category                 | Count |
|--------------------------|-------|
| Preventative Maintenance | 1909  |
| Component Failure        | 1084  |
| Installation Issue       | 1880  |

Repaired/Replaced Part by Date

Count, EWMA=0.5+CBS, Average

# Part Tracking for Serialized Systems

# Templates and Serialized Systems

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- A “Template” is a hierarchical configuration used to track issues by generic part/version or process/task (e.g., Bill of Materials)
  - Build via the website
  - Import from ReliaSoft Xfmea/RCM++/RBI
  - Import from Excel or XML
- If you want to track specific systems identified by serial number, you can also define a “Serialized” configuration for each individual unit
  - Complete history of incidents, repairs and replacements for each system
  - Yields more accurate time/usage data for reliability analysis

# Customer Support for Serialized Systems

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- If you are tracking specific systems based on serial number/TAG, XFRACAS can capture details such as:
  - Customer contact info
  - Installation (commissioning) details
  - Terms of warranty agreement
  - Current status of the system (running, waiting for part)
  - ...
- Tracks a full history of:
  - All reported incidents
  - All reported time/usage metrics (hours, cycles)
  - Exact system configuration as it changes over time


# Customer Support Page


(YOU CAN CUSTOMIZE TO FIT YOUR NEEDS)


**REL-1** **RELIASOFT MODEL DATABASE**

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**Shipment Date:** 09/01/2017 


**Commission Date:** 09/12/2017 

**Decommission Date:** N/A 

**Delivery Date:** 09/08/2017 

**Location:** Test Location

**Distributor:** [TEST Dist](#)

**Run Hrs:** 120 

**Estimated System Hours:** 120

**System Status:** Running

**System Configuration:** SN: 08221995, Trolley, 2 wheeled 120001

**Under Warranty:** Yes - Expires 09/12/2018

**Customer/Location Information**

**Warranty Information**




**Initial Warranty**

Months from Shipment:  Warranty Type:

Months from Commission:

**Extended Warranty**

Months:  Terms:

Purchase Date:    Time:   AM  PM   

**Incident History**

**Installation Details**

**Accessories**

# Reliability Data Analysis and FMEAs

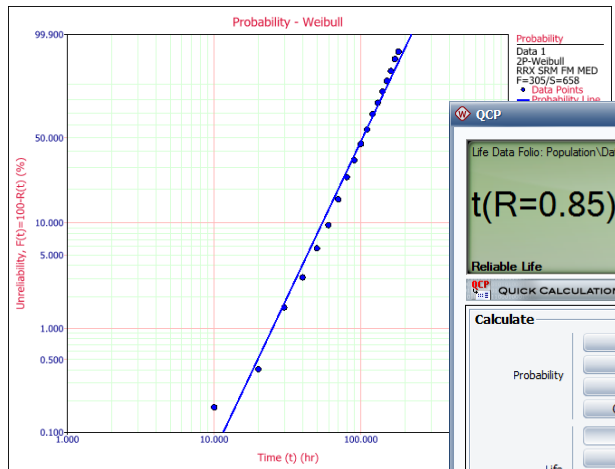
# Reliability Data Analysis

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- The incident reporting process in XFRACAS can result in clean, usable data for reliability analysis in ReliaSoft desktop applications
- Use the Data Warehouse in Weibull++, ALTA or RGA to extract data and transfer to an analysis folio
- If XFRACAS data entry is based on fully serialized systems, you can extract complete time-to-failure and suspension data by system, subsystem and component

# Weibull++/ALTA – Life Data Analysis

- Extract failure and suspension times/usage for a specific part number or group of part numbers
- Use Weibull++ to fit a distribution for:
  - Time to Failure
  - Time to Repair (if captured for incidents)
- For serialized systems, you can track your at-risk population of all parts and components → the SDW calculates suspensions based on reported hours/usage



QCP

Life Data Folio: Population\Data 1

**t(R=0.85) 62.956143 hr**

Reliable Life hr No Bounds Captions On

QUICK CALCULATION PAD Units Bounds Options

Calculate

Probability

- Reliability
- Prob. of Failure
- Cond. Reliability
- Cond. Prob. of Failure

Life

- Reliable Life
- BX% Life
- Mean Life
- Mean Remaining Life

Rate

- Failure Rate

Input

Required Reliability

Calculate Report Close

Population

|   | Number in State | State F or S | State End Time | Subset ID |
|---|-----------------|--------------|----------------|-----------|
| 1 | 2               | F            | 10             |           |
| 2 | 104             | S            | 10             |           |
| 3 | 2               | F            | 20             |           |
|   | 98              | S            | 20             |           |
|   | 9               | F            | 30             |           |
|   | 88              | S            | 30             |           |
|   | 10              | F            | 40             |           |
|   | 76              | S            | 40             |           |
|   | 16              | F            | 50             |           |
|   | 52              | S            | 50             |           |
|   | 20              | F            | 60             |           |
|   | 72              | S            | 60             |           |
|   | 31              | F            | 70             |           |
|   | 38              | S            | 70             |           |
|   | 37              | F            | 80             |           |
|   | 36              | S            | 80             |           |
|   | 34              | F            | 90             |           |
|   | 35              | S            | 90             |           |
|   | 34              | F            | 100            |           |
|   | 18              | S            | 100            |           |
|   | 31              | F            | 110            |           |
|   | 14              | S            | 110            |           |

Main

LIFE DATA

Distribution: 2P-Weibull

Analysis Settings

|     |     |
|-----|-----|
| RRX | SRM |
| FM  | MED |

Analysis Summary

Parameters

Beta: 2.995005  
Eta (hr): 115.480530

Other

Rho: 0.991985  
LK Value: -1629.507799

Failures/Suspensions

F/S: 305/658

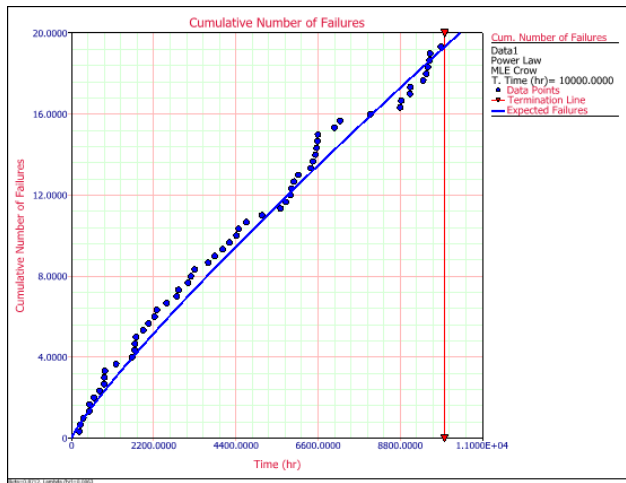
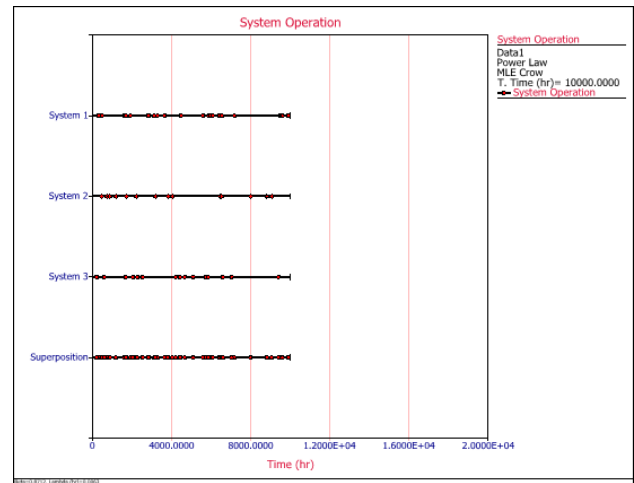
Comments

Plot of Data 1

# RGA – Repairable, Fleet or Growth

- Fielded Systems
  - Repairable Systems Analysis
    - Power Law
  - Fleet Analysis
    - Crow-AMSAA (NHPP)
- Reliability Growth Analysis
  - Multiple Systems – Concurrent Operating Times
    - Crow-AMSAA (NHPP) or Duane

| Time to Event | Comments |
|---------------|----------|
| 0             | Start    |
| 10000         | End      |
| 320.3         |          |
| 485.6         |          |
| 1625.6        |          |
| 1706.1        |          |
| 1926.4        |          |
| 2818.1        |          |
| 2869.8        |          |
| 3126.3        |          |
| 3299.3        |          |
| 3664.4        |          |
| 4480.9        |          |
| 5604.2        |          |
| 5896.6        |          |
| 5960.6        |          |
| 6080.6        |          |
| 6412.7        |          |
| 6570.6        |          |
| 7195          |          |
| 9499.8        |          |
| 9546.4        |          |
| 9591.5        |          |
| 9605.5        |          |
| 9893.6        |          |

# XFRACAS and XFMEA

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- Synchronize generic system templates (“bill of materials”)
- Use an existing FMEA to identify the Failure Mode > Root Cause for an incident, problem or failure analysis in XFRACAS
- Use incidents reported in XFRACAS to identify new failure modes that need to be assessed in an FMEA
- Use the number of reports in XFRACAS for a particular Failure Mode > Root Cause as input to calculate risk priority metrics in an FMEA (RPN, SxO)

# XFRACAS and SEP

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- The SEP web portal provides web-based access to key analysis and project management details from ReliaSoft desktop applications such as Weibull++, XFMEA and BlockSim
- For users who also have XFRACAS, SEP:
  - Links to both the XFRACAS actions and ReliaSoft desktop actions that are relevant to you
  - Links to incidents where you are the owner
  - Links to reports and charts you have selected to “watch” in XFRACAS
  - Displays FMEAs for systems and parts you are tracking in XFRACAS
- For users who don't have direct access to desktop applications or XFRACAS, SEP can display custom SDW dashboards based on any saved XFRACAS report

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