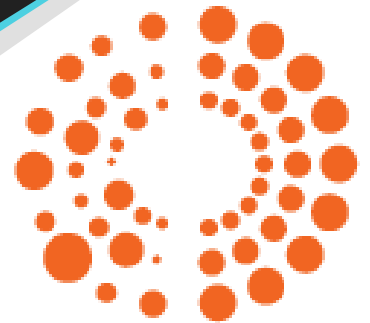


Interfacility and machine image quality analysis using a cloud- based system

Image Owl, Inc.
AAPM/COMP PINS 2020

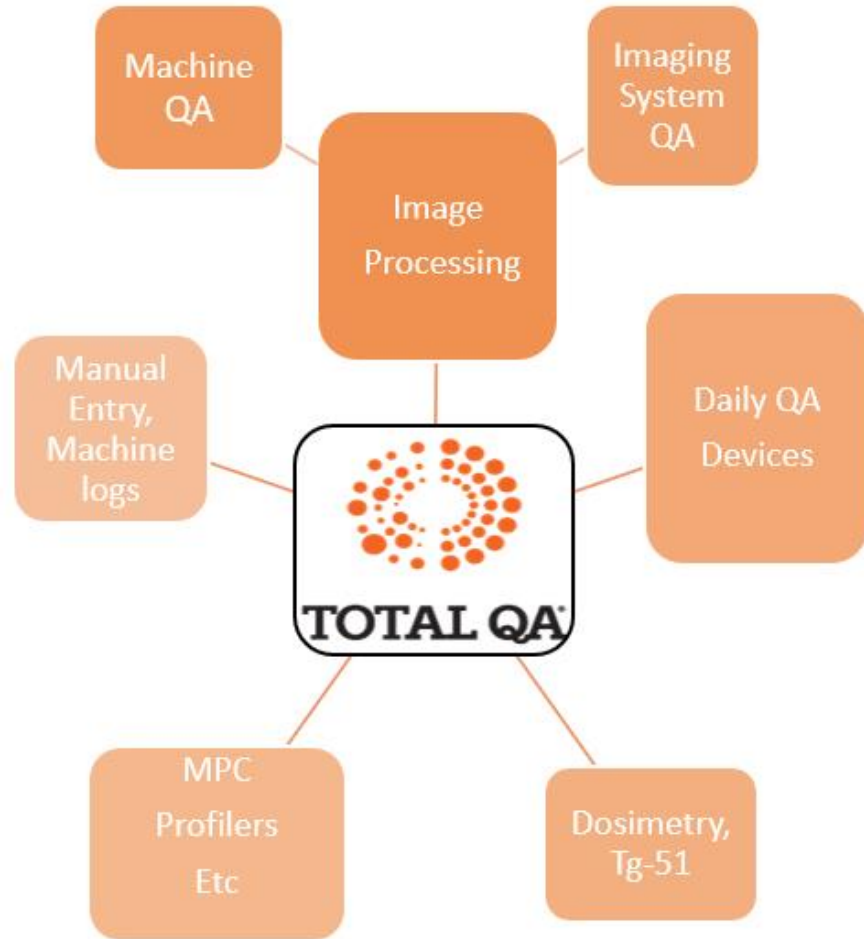
Matt Whitaker- President- Image Owl, Inc.



TOTAL QA[®]

The Total QA[®] System

-
- Cloud-Based
 - Vendor-agnostic for phantoms and devices



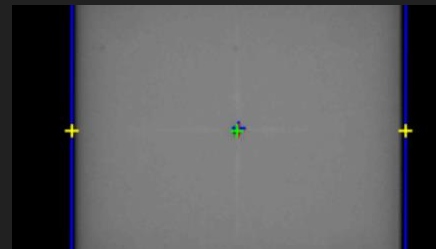
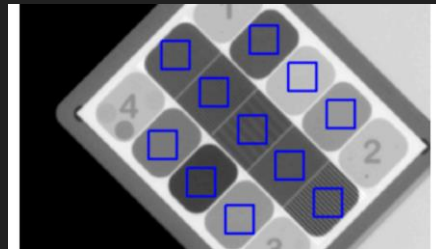
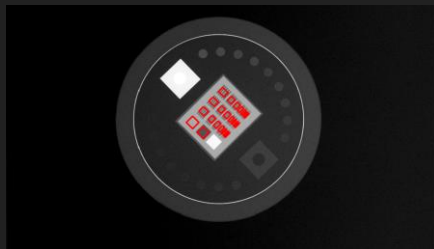
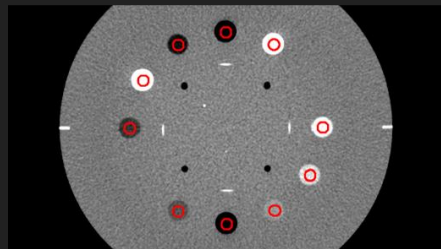
Imaging QA Scope (Phantoms)

Catphan[®]- 500, 600 and 700 series

Leeds- kV Planar

SI QC-3 (MV), QC-kV(kV), FC-2(Light Field, Asym.)

Various Winston-Lutz phantoms



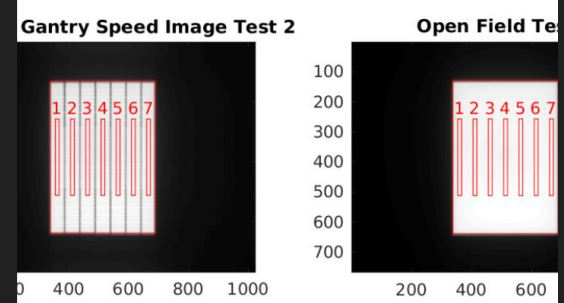
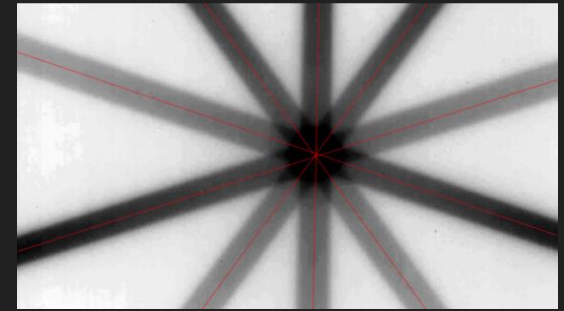
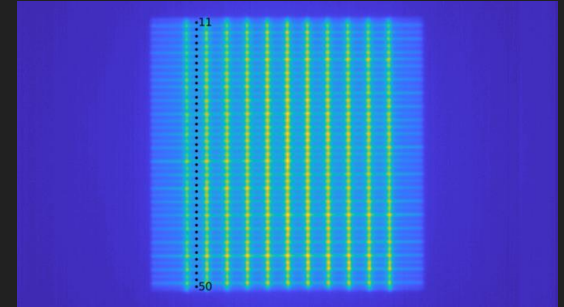
Imaging QA Scope (EPID and Others)

Picket Fence

VMAT Tests

Starshot

Dosimetric Leaf Gap



Setting up imaging test schedules

Custom Tests



Custom Tests

Available tests

Search

Templates

- Waterbath Analysis
- Additional Daily Linac tests
- Additional Monthly Linac tests
- Calphan Analysis
 - Sensitometry
 - Air [HU]
 - Air 2 [HU]
 - Lung foam [HU]
 - PMP [HU]
 - LDPE [HU]
 - Water [HU]
 - Polystyrene [HU]
 - Acrylic [HU]
 - Delrin [HU]
 - Hydroxypatite 20% [HU]
 - Hydroxypatite 50% [HU]
 - Teflon [HU]
 - Contrast scale [cm²HU⁻¹]
 - Effective energy
 - Linearity plot
 - Residual plot

Save

Merge templates



1. Cone Beam CT

Tolerances

- Geometric distortion [mm]
- Spatial resolution [lp/cm]
- Contrast (Detail at 1% contrast level) [mm]
- HU constancy [HU]

QA Test	Type	Baseline	Tolerance limit		Action limit		Percentage
			Lower	Upper	Lower	Upper	
HU constancy [HU]	Baseline Absolute	10	5	5	10	10	<input checked="" type="checkbox"/>

- Uniformity [HU]
- Noise [HU]



Add the groups that are allowed to perform this QA *

- Therapist
- Administrator
- Physicist
- Physicist administrator

Status *

- Active
- Inactive

Who? When?

Create a name and schedule for this test

Schedule name *

All Calphan Tests

Frequency *

Monthly

Next due date *

2020-06-19

Repeat every *

1 months(s)

Repeat by *

- day of the month
- day of the week

Due days *

Mount Skylight Clinic

IX ML+

Schedule

Daily QA w/ DQA3

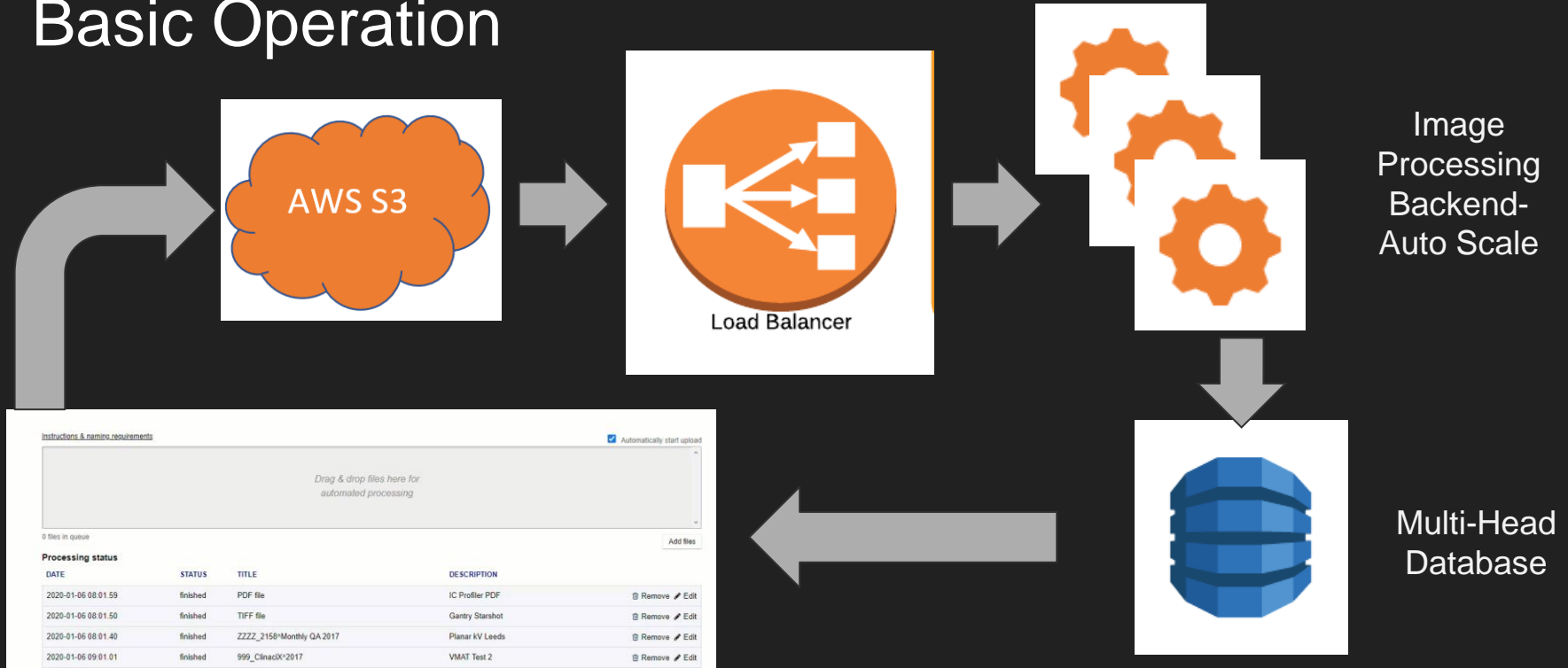
Daily QA w/ PTW Quickcheck 39 weeks overdue

Annual QA No reports

Daily Check

Monthly QA

Basic Operation



MACHINE	SCHEDULE	DATE	NOTICE	TESTS PERFORMED	CREATED BY	SIGNATURE
Hospital TrueBeam	Daily QA w/ QABC	Jun 19th 2020	Pass	3 / 21 (18)	Image Owl	
Hospital HDR	HDR Daily	Jun 16th 2020	Pass	1 / 16 (15)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Jun 10th 2020	Action	5 / 21 (18)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Jun 10th 2020	Pass	5 / 21 (18)	Image Owl	
Hospital HDR	HDR Daily	May 28th 2020	Pass	1 / 16 (15)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	May 20th 2020	Action	5 / 21 (18)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	May 6th 2020	Action	4 / 21 (17)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	May 5th 2020	Action	5 / 21 (18)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Apr 23rd 2020	Pass	2 / 21 (19)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Apr 17th 2020	Pass	6 / 21 (15)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Apr 8th 2020	Warning	18 / 18 (0)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Apr 8th 2020	Warning	17 / 18 (1)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Apr 8th 2020	Warning	18 / 18 (0)	Image Owl	
Hospital TrueBeam	MPC TB v2.7	Mar 31st 2020	Images processing	25 / 25 (0)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Mar 26th 2020	Action	7 / 21 (14)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Mar 10th 2020	Action	7 / 21 (14)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Mar 10th 2020	Pass	4 / 21 (17)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Feb 25th 2020	Action	8 / 21 (13)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Feb 21st 2020	Action	9 / 21 (12)	Image Owl	
Hospital TrueBeam	Daily QA w/ QABC	Feb 18th 2020	Action	4 / 20 (18)	Image Owl	

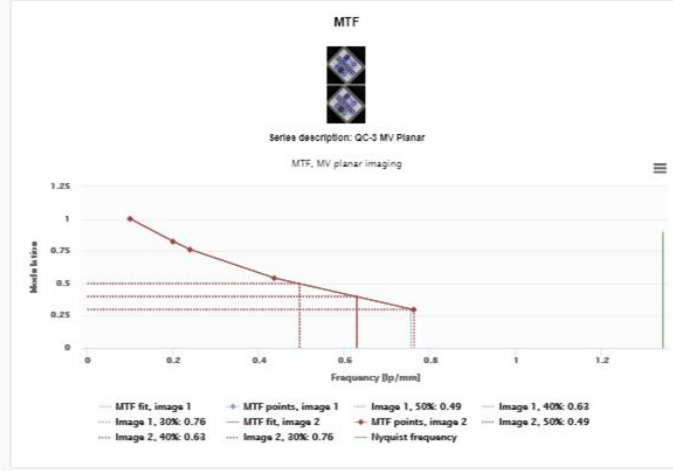
TAL QA

Sections

- Dosimetry (Monthly)
- Profiler PDF Import
- Cone Beam CT
- CBCT/CT (Detailed Calphan QA)
- Planar MV Imaging (EPID)
- Planar kV Imaging (GCKV-1)
- Mechanical (Annual)
- Monthly MLC Tests
- Planar kV Imaging (Leads)
- Mechanical (Monthly)
- Multileaf collimation (TIG-142 Task V)
- Imaging Monthly
- VMAT Test 2
- VMAT Test 3

Scaling (measured at typical SSD)

Left/Right	Up/down
0.000	-0.51



Spatial resolution

Image number	50%	40%	30%
1	0.495	0.628	0.755
2	0.495	0.628	0.762



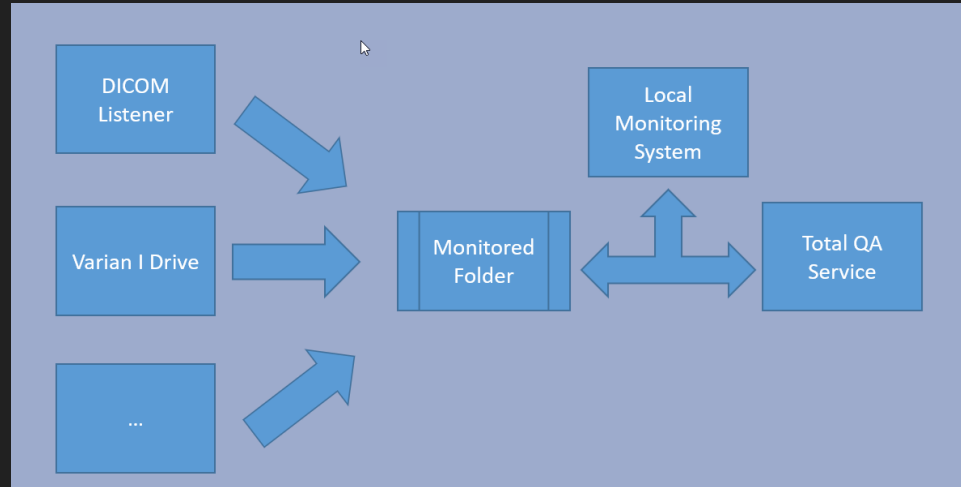
Reports

Using the Total QA API for gathering data

Total QA comes with a complete REST API.

Allows complete data upload, retrieval and management capabilities

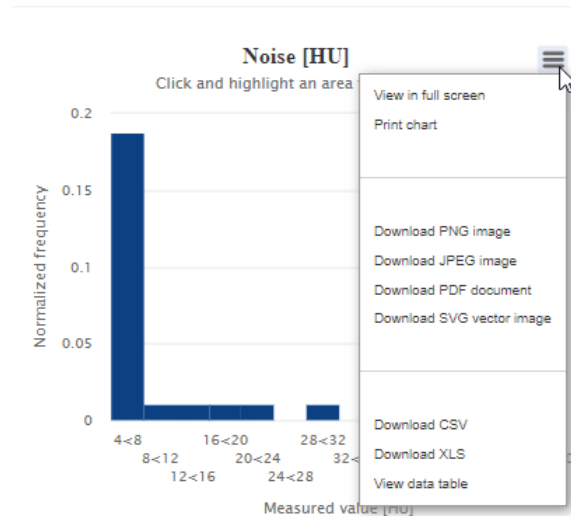
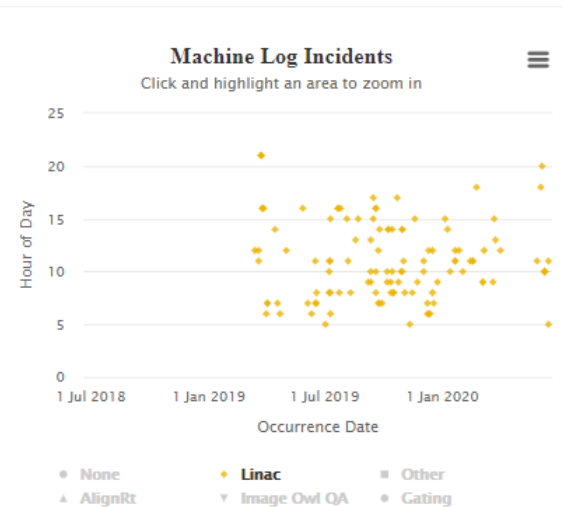
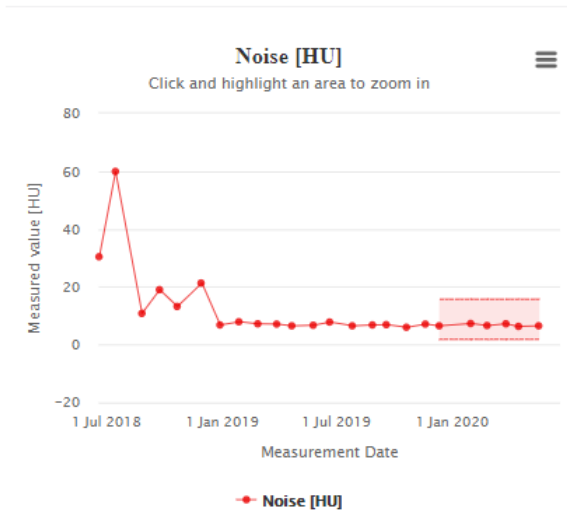
Programming Language Agnostic



Combining with other data sources.

Longitudinal data

from to



Data analysis and comparisons

TOTAL QA

Schedules
Review
Reports
Documents
Analysis
Manage
Machine Log
Help

Image Owl Support

Sign out

Compare Data

Filter by Schedule: Monthly

Date: All Dates
From: 2011-08-11 To: 2020-06-19

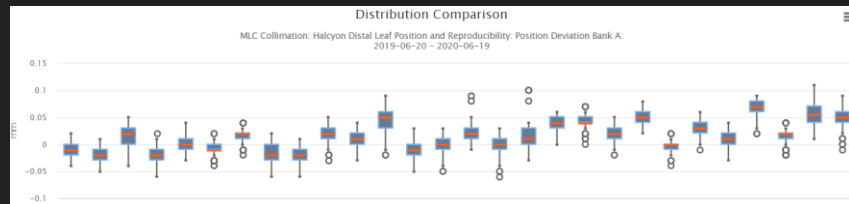
Tests
Uniformity [HU]

Export Summary CSV | Export All Data as CSV

Site	Machine	Schedule	Count	Mean HU	Median HU	Standard Deviation HU	Max HU	Min HU
		Monthly	85	12.81	9.80	9.2478	45.40	2.10
		Monthly	87	15.94	16.20	7.2704	35.90	3.00
		Monthly	66	21.88	17.95	11.9111	56.30	1.00
Select a Site(s)			238					

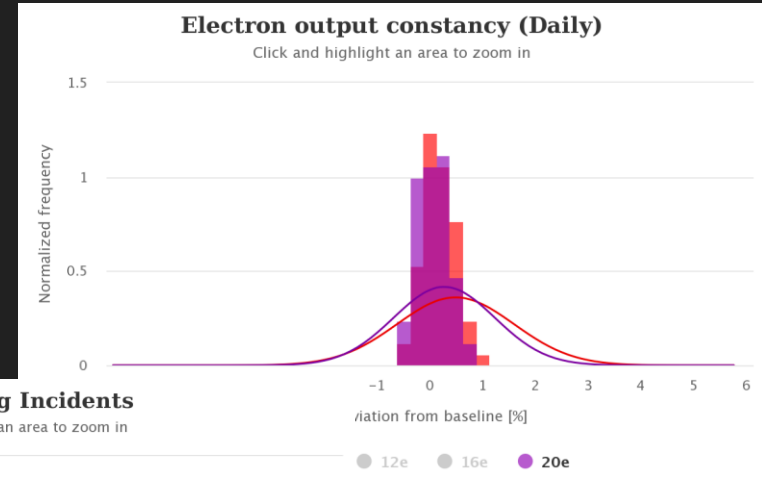
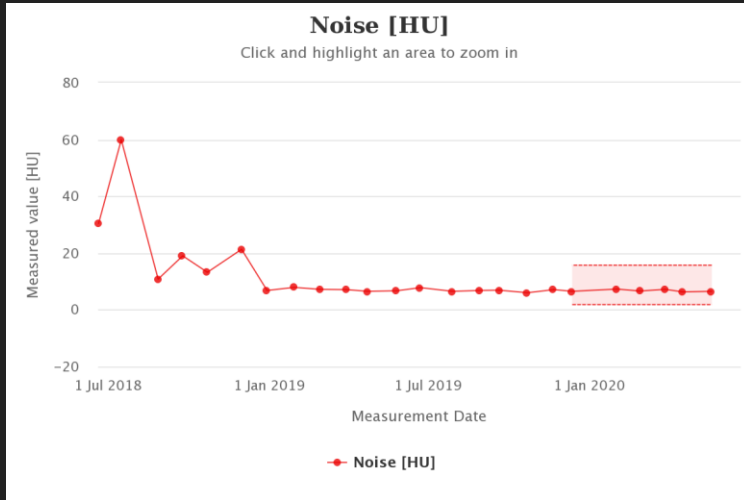
Distribution Comparison

Cone Beam CT: Uniformity [HU]
2011-08-11 - 2020-06-19



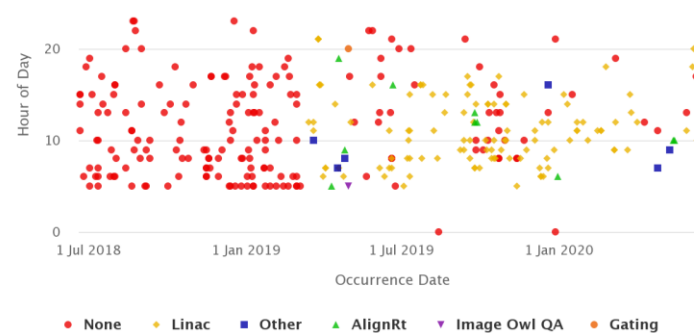
	A	B	C	D	E	F	G	H
	Test	Site	Machine	Schedule	Report Date-Time	Report URL	Value	Unit
2	Noise [HU]			1 Monthly	5/23/2014 22:23	https://tqa.imageowl.com/reports/view/2903	9 HU	
3	Noise [HU]			1 Monthly	5/23/2014 22:23	https://tqa.imageowl.com/reports/view/2903	9 HU	
4	Noise [HU]			1 Monthly	6/16/2014 16:57	https://tqa.imageowl.com/reports/view/4301	9 HU	
5	Noise [HU]			1 Monthly	6/26/2014 19:07	https://tqa.imageowl.com/reports/view/4730	9.4 HU	
6	Noise [HU]			1 Monthly	6/26/2014 19:07	https://tqa.imageowl.com/reports/view/4730	10.4 HU	
7	Noise [HU]			1 Monthly	7/8/2014 19:38	https://tqa.imageowl.com/reports/view/5529	9.3 HU	
8	Noise [HU]			1 Monthly	7/8/2014 19:48	https://tqa.imageowl.com/reports/view/5989	7.4 HU	
9	Noise [HU]			1 Monthly	7/29/2014 17:37	https://tqa.imageowl.com/reports/view/5996	9.8 HU	
10	Noise [HU]			1 Monthly	8/27/2014 17:24	https://tqa.imageowl.com/reports/view/6237	9.7 HU	
11	Noise [HU]			1 Monthly	9/20/2014 14:20	https://tqa.imageowl.com/reports/view/6386	9.1 HU	
12	Noise [HU]			1 Monthly	10/11/2014 15:12	https://tqa.imageowl.com/reports/view/6501	6.9 HU	
13	Noise [HU]			1 Monthly	11/11/2014 15:34	https://tqa.imageowl.com/reports/view/6598	9 HU	

Reports and Trending



Machine Log Incidents

Click and highlight an area to zoom in



Final Thoughts



Total QA provides a low maintenance cloud platform to integrate imaging data from multiple sites with other sources of QA data.

Total QA provides a platform through its API and other tools to build upon.

Total QA's agnostic approach allows users to use a variety of imaging phantoms and sources.

Total QA allows users to compare data across multiple machine and facilities.

info@imageowl.com