nSpec Version 0.23.1.0

Release Date: 22 Nov 2023

Documentation Updated: 04 Jan 2024

Major Features: Report Summary Image Export

Overview

nSpec v0.23.1.0 includes a number of long-awaited bug fixes, fixes to bugs found in v0.23.0.0, deprecations, and new performance features and improvements, including Report Summary Image Export which allows users to automatically save nView generated reports.

Upgrading to v0.23.1.0

Library Update Not Required

If upgrading from a version more than 1 release prior, please reference all intermediate release notes for upgrade steps *for each version*.

Deprecation

There are a number of deprecations in nSpec v0.23.1.0, including deprecating use of the first generation autoloader. Customers with this autoloader version wishing to upgrade to v0.23.1.0 and beyond will require hardware upgrades.

Deprecation Changelog

T	Key	Summary
	NSPEC-3430	Deprecate "Edit Last Scan's ROI" functionality
	NSPEC-6031	Deprecate Filter & Crop utility
	NSPEC-7184	Deprecate Autoloader1
	NSPEC-7186	Deprecate Olympus MX61 Illuminator Hardware
	NSPEC-7251	Deprecate AFM Use in nSpec
	NSPEC-7363	Deprecate nSpec 3D in Scan Dialog

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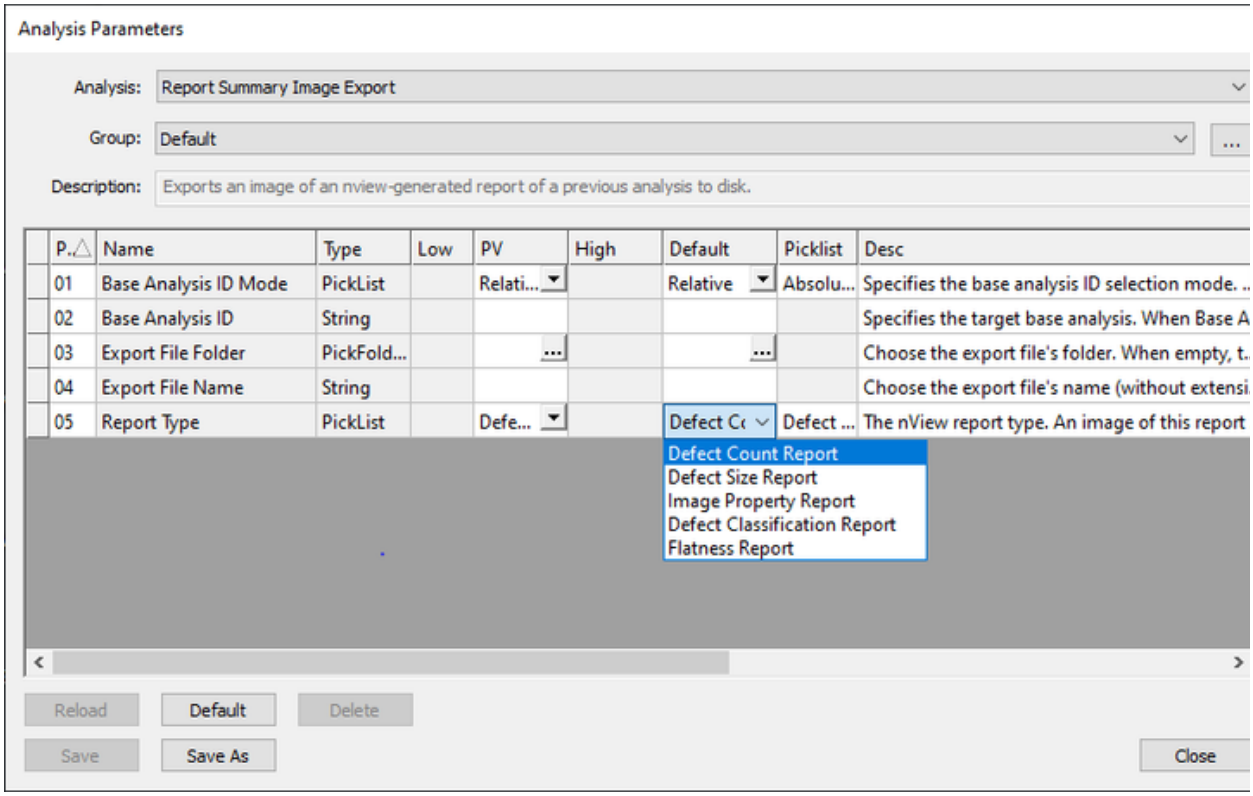
Major Enhancements

Report Summary Image Export

This feature was first introduced in nSpec v0.23.1.0.

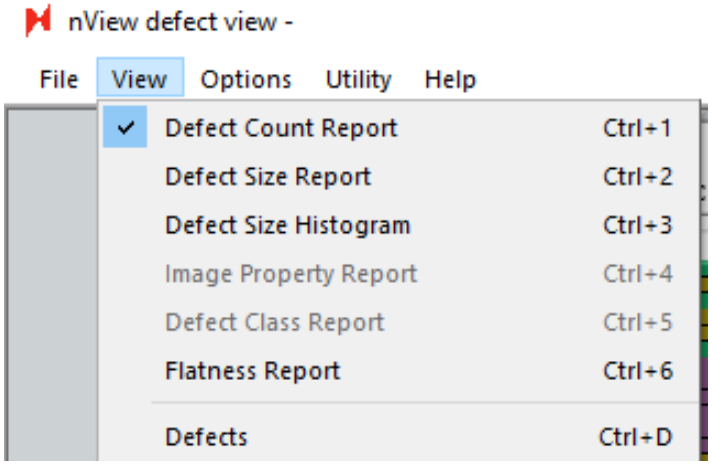
The Report Summary Image Export allows users to automatically export reports as PNG images by adding the Report Summary Image Export as part of a Group Analysis. This analyzer is meant to automate the process of opening up an analysis result, choosing the type of report to view, and exporting the selected report.

This analyzer must be used with a Base Analysis (i.e. must be used with a previous analysis), and can be used to export the following report types: Defect Count Report, Defect Size Report, Image Property Report, Defect Classification Report, Flatness Report.



Note that not all report types are compatible with all types of analyses. For example, an Image Property Report can only be exported following a Surface Scattering Analysis, and a Defect Classification Report can only be exported following an analysis that includes defect classification, for example, after an AI Analysis. The selected Report Type must be appropriate for the analysis that it follows, otherwise the Report Summary Image Export will not have the correct data or analysis to generate the selected report from.

The quickest way to understand what report types are available for a given analysis is to view analysis results (**nSpec Main View > Analysis > View Analysis Results…**) and see what reports are available to view in nView. The example below shows the available report options for a Device Inspection Analysis.



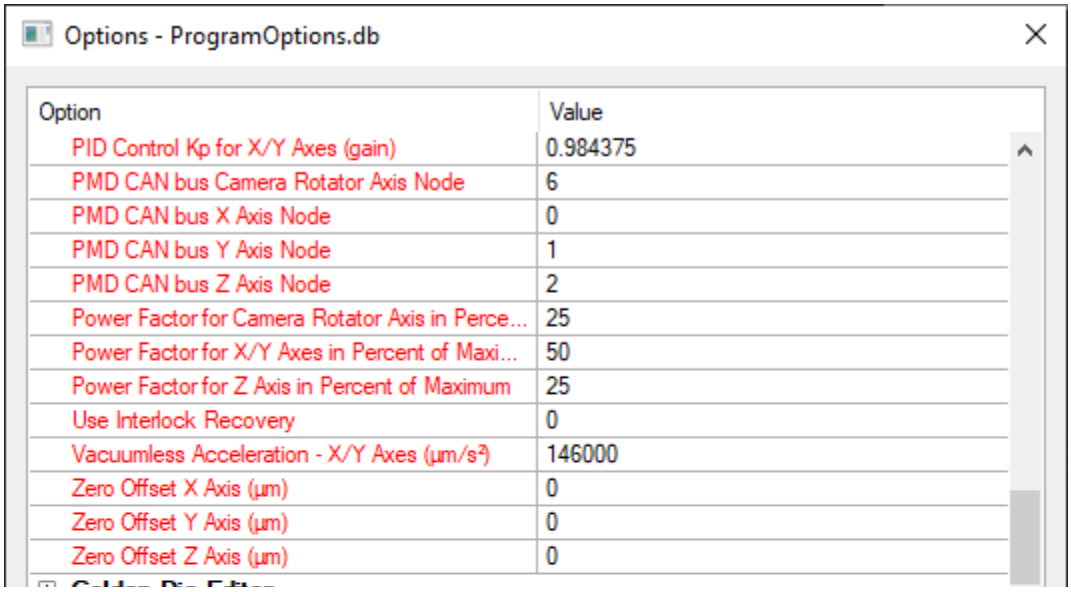
Lastly, a Custom Filename Suffix parameter was added to the Report Summary Image Export in nSpec v0.23.2.0. The suffix will be appended to the Export File Name.

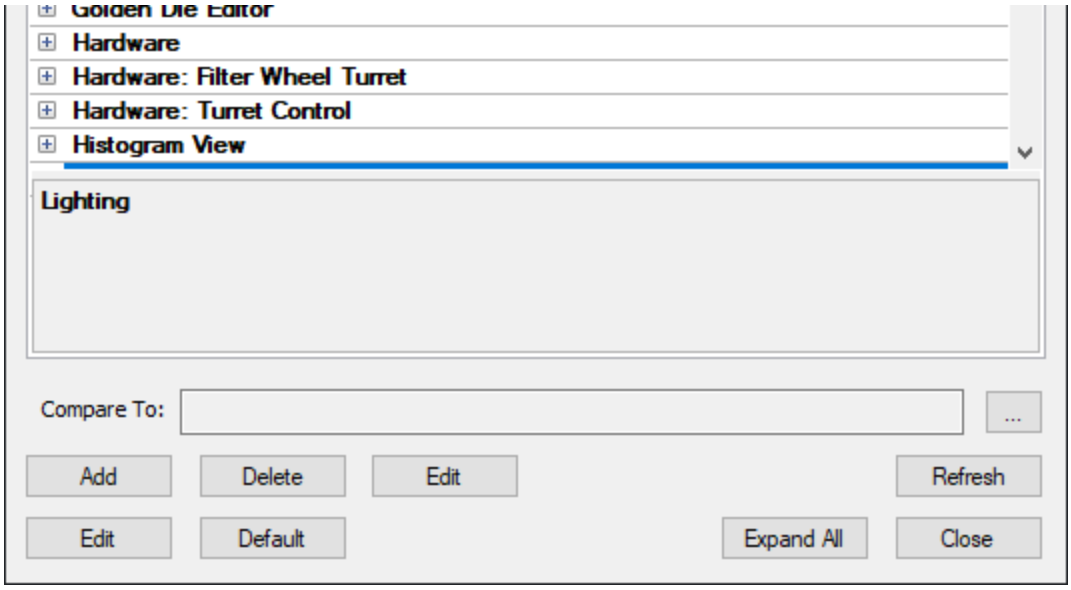
New Features

Highlights

NSPEC-4508: nSpec can apply global X, Y, Z offsets to aid in tool synchronization

Three new program options have been introduced to aid in tool synchronization. **Zero Offset X Axis (µm), Zero Offset Y Axis (µm), and Zero Offset Z Axis (µm)** can be found in the **Controller: Stage** section Program options. In most use cases, tools only require the Z axis to be offset for synchronization, and the X and Y offsets can be kept at the default of 0.





NSPEC-6304: Ability to automatically export reports via new Report Summary Image Export

Certain reports can be automatically saved in PNG form by adding Report Summary Image Export Post-Analysis to a Group Analysis. See more in the *Major Enhancements* section.

NSPEC-6990: Add an Export Destination for Cropped Images Analyzer

Cropped Images Analyzer now allows users to specify a destination path for exports.

Parameter	Current Description	Suggested Description
Export Destination	Select a folder to save the Cropped images	Select a folder to save the Cropped images. If empty, will save to the scan's Analysis folder.
Export Folder Name	Type the name of the folder to save the Cropped images	Type the name of the folder to save the Cropped images. If empty, the folder's name will be automatically filled.

NSPEC-7598: Updated Nanotronics Illuminator Board Supports Third Light Source

New revision to nSpec hardware will allow for a third controllable light source.

NSPEC-7834: Cropped Images Analyzer ability to save all defects to single TIFF stack

Cropped Images Analyzer now has the ability to export defect images to a single TIFF stack. To save all defects to a single TIFF stack, choose the "Export as Multi-Page Images" option. "Export as Separate Images" will export each defect as its own JPG file.

New Features Changelog

T	Key	Release Notes Summary
	NSPEC-4508	nSpec can apply global X, Y, and Z offsets to aid in tool synchronization

NSPEC-6304	Ability to automatically export reports via new Report Summary Image Export
NSPEC-6990	Add an Export Destination for Cropped Images Analyzer
NSPEC-7056	Increased GPU performance during Flat Field Correction
NSPEC-7598	Updated Nanotronics Illuminator Board Supports Third Light Source
NSPEC-7620	Program option "Automatic Light Shutoff Enable" defaults to true
NSPEC-7766	User Parameter Export Destination for Report Summary Image Export
NSPEC-7834	Cropped Images Analyzer ability to save all defects to single TIFF Stack

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Bug Fixes

Highlights

NSPEC-5953: Group jobs specifying different slots fail to load wafers

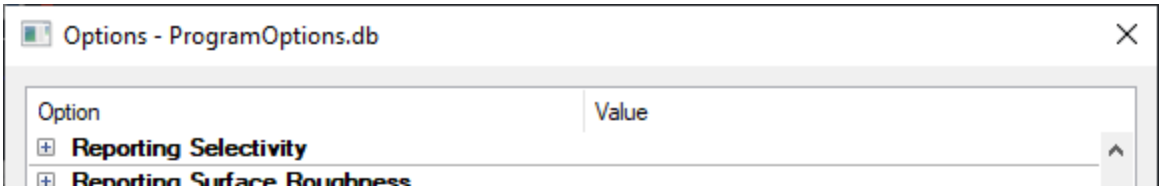
This bug made it such that when running a group job in which different jobs are run on different wafers, e. g. running a group job in which job A is run on the wafer in slot X, and job B on a wafer in slot Y, nSpec fails to move the wafer from slot X from the stage and continues to run job B on the wafer from slot X.

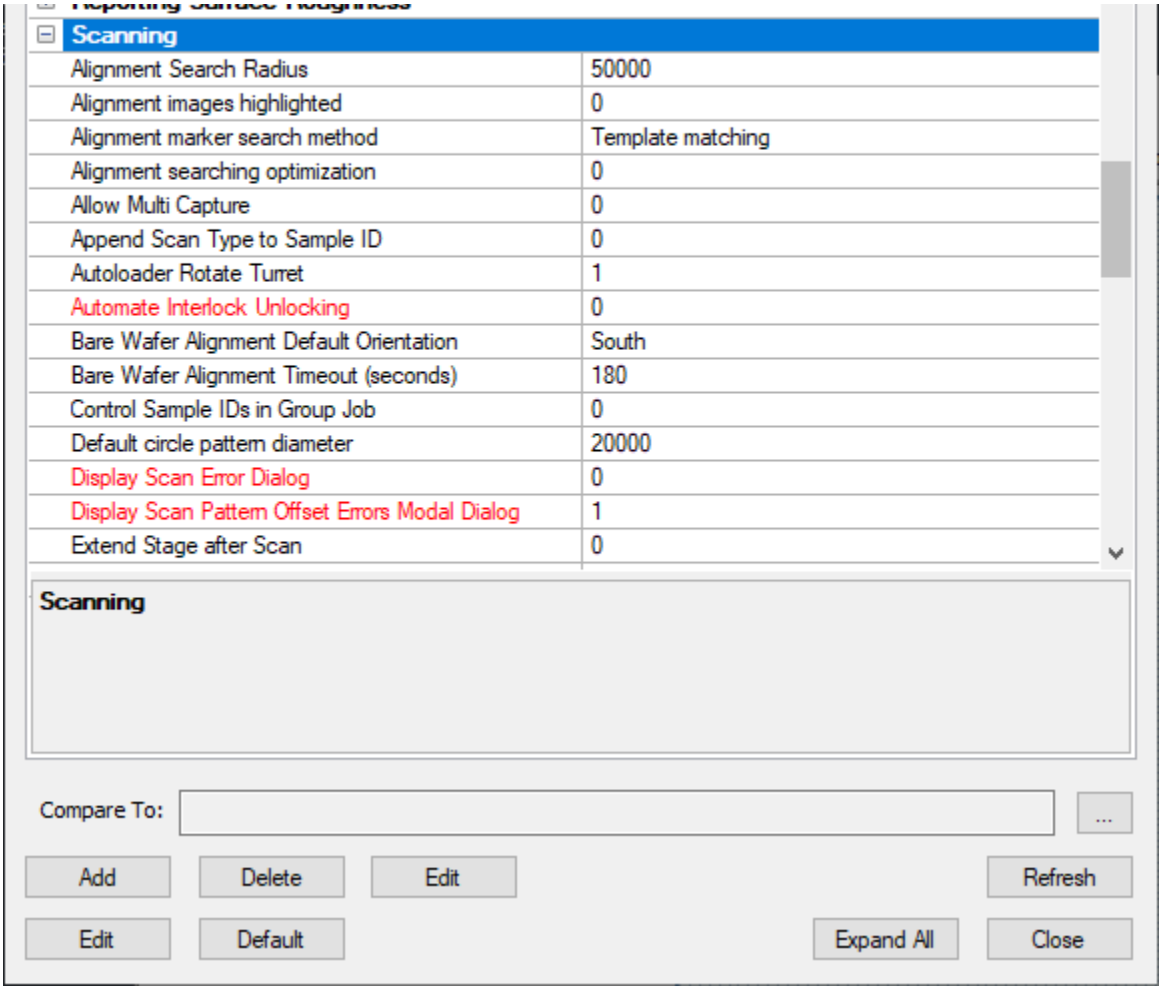
NSPEC-6043: “Scan Pattern Exceeds…” pop-up blocks cassette production flow when using Bare Wafer Alignment

A ”Scan Pattern Exceeds Stage X maximum by 0.000000 microns” message pops up on every wafer when running a wafer scan, wafer cassette job, loop job, or loop scan when the pattern offset is set to 0 for X and Y. A new Program Option **Display Scan Pattern Offset Errors Modal Dialog** can be set to prevent this message from popping up and disrupting the scan.

This new option defaults to 1, which allows the above blocking popup to display, and allows the operator to respond accordingly. If set to 0, the blocking modal dialog will **not** display and the scan will continue without disruption, with the calculated offset and error written to the log.

The **Display Scan Pattern Offset Errors Modal Dialog** option can be found under the Scanning tab.





NSPEC-7540: Scan fails during looped job when nSpec tries to locate wafers in slots that are empty

nSpec will map the cassettes correctly before the start of the looped job, but will not correctly follow that map when scanning. The first cassette will scan and analyze correctly, but on the second cassette, nSpec will try to locate a wafer where there is none, which causes the job to fail.

NSPEC-7615: Gen IV AI model trained with nTelligence 5.0.0.4 not as accurate as models trained with nTelligence 5.0.0.1

There was a bug in nTelligence 5.0.0.4 in which trained Gen IV AI models had worse performance when compared to models trained in nTelligence 5.0.0.1. Models trained with 5.0.0.4 were seen to have an increase in false positive for larger defects, and not detect smaller defects at all.

NSPEC-7665: Manual Set Autofocus Type broken for group jobs

When setting up a group job in which jobs have scan settings with **Autofocus Type** set to **Manual Set** with different **Initial Z Position**, jobs would all be run with the **Initial Z Position** of the first job.

Changelog

T	Key	Release Notes Summary	Affected Releases
	NSPEC-5177	User unable to cancel Device Inspection via 'Cancel Analysis' button	0.21.0.0, 0.21.1.0, 0.22.0.0, 0.22.1.0, 0.23.0.0, 0.22.1.1, 0.22.1.2, 0.22.1.3, 0.22.1.4, 0.22.1.5, 0.22.1.6
	NSPEC-5340	Scan fails when Sample ID of first wafer to be scanned matches the slot's number in the cassette	0.21.0.0, 0.21.1.0, 0.22.0.0, 0.22.1.0, 0.23.0.0, 0.22.1.1, 0.22.1.2, 0.22.1.3, 0.22.1.4, 0.22.1.5, 0.22.1.6
	NSPEC-5888	Initial wafer edge search during Bare Wafer Alignment is suboptimal for larger 8 inch wafers	0.22.0.0, 0.22.1.0, 0.23.0.0, 0.22.1.1, 0.22.1.2, 0.22.1.3, 0.22.1.4, 0.22.1.5, 0.22.1.6
	NSPEC-5953	Group Jobs specifying different slots fail to load wafers	0.21.1.0, 0.22.0.0, 0.22.1.0, 0.23.0.0, 0.22.1.1, 0.22.1.2, 0.22.1.3, 0.22.1.4, 0.22.1.5, 0.22.1.6
	NSPEC-6043	"Scan Pattern Exceeds…" pop-up blocks cassette production flow when using Bare Wafer Alignment	0.22.0.0
	NSPEC-6576	Unable to add job groups to job subfolders	0.22.1.0, 0.23.0.0, 0.22.1.1, 0.22.1.2, 0.22.1.3, 0.22.1.4, 0.22.1.5, 0.22.1.6
	NSPEC-6954	Unnecessary F-stop engagement when GetFocusFromAlignment job property enabled	0.23.0.0
	NSPEC-7286	Device layout dialog can create 2 devices in same location when Extrapolate button is pressed twice	0.23.0.0
	NSPEC-7307	Improve Filter Wheel Initialization Consistency	0.23.0.0
	NSPEC-7336	Old unused program option AutoFocus display Z Offset still present in UI	0.23.0.0, 0.22.1.5
	NSPEC-7446	nSpec does not set `ScanErrorMessage` GEM variable when a scan error occurs	0.23.0.0
	NSPEC-7503	Last scan mosaic is off when a job uses a different camera binning that the current one	0.23.0.0
	NSPEC-7523	Scan settings OK button sometimes improperly enabled after adjusting SampleID field	0.23.0.0
	NSPEC-7530	Coordinates displayed in Stage View window do not update when navigating the stage	0.23.0.0
	NSPEC-7539	nSpec crashes during scan when entire scan path is outside of the stage range	0.23.0.0
	NSPEC-7540	Scan fails during looped job when nSpec tries to locate wafers in slots that are empty	0.23.0.0
	NSPEC-7548	nScan crashes on very first boot	0.23.0.0
	NSPEC-7585	Inconsistency with flat field calibration	0.23.0.0, 0.22.1.1
	NSPEC-7589	RGBW transmitted light source not detected in tools with dual light sources	0.23.0.0

	NSPEC-7597	Unable to move stage after unlocking and re-locking enclosure door	0.23.0.0
	NSPEC-7606	Coordinates displayed in Stage View window do not update when navigating the stage for systems with single objectives	0.23.0.1
	NSPEC-7608	Sometimes stage and autoloader initialize at the same time causing stage to hit end effector	0.23.0.0
	NSPEC-7609	Stage calibration not working	0.23.0.0
	NSPEC-7615	Gen IV AI model trained with nTelligence 5.0.0.4 not as accurate as models trained with nTelligence 5.0.0.1	0.23.0.0
	NSPEC-7625	nTelligence Gen IV AI template matching non-functional	0.23.0.0
	NSPEC-7633	Setting GetFocusFromAlignment job property causes error	0.23.0.0
	NSPEC-7639	Save Camera Angle does not work as expected	0.23.0.0
	NSPEC-7644	Issue running Device Inspection on GPU	0.23.0.0
	NSPEC-7657	No error message when scan exceeds stage bounds	0.23.0.1
	NSPEC-7665	Manual set autofocus type broken for group jobs	0.23.0.0
	NSPEC-7681	nSpec not detecting Filter Wheel	0.23.0.1
	NSPEC-7683	Subscan Generator Stopped Sending AnalysisComplete Messages to GEM	0.23.0.1
	NSPEC-7715	Z-axis Motion Issues when Global XYZ Offset Enabled	0.23.0.1
	NSPEC-7776	Filter Wheel fails to initialize after rebooting	0.23.0.0, 0.23.0.1, 0.23.0.2
	NSPEC-7792	Scan moves in the same row twice for User-defined scan	0.23.0.3
	NSPEC-7807	Fiducial analysis fails to export the analysis output path via GEM when there are no fiducials that require tile stitching	0.23.0.2
	NSPEC-7811	Issues with prealigner in Gen 2 machines	0.23.0.2
	NSPEC-7833	Selecting a scan pattern type does not update objective-specific pattern options	0.23.0.2
	NSPEC-7846	Wafer diameter logged during Bare Wafer Alignment is incorrect	0.23.0.2

	NSPEC-7857	Improper abort behavior in GEM	0.23.0.3
	NSPEC-7869	Missing GEM Events When Cancelling the First Scan	0.23.0.4
	NSPEC-7882	Scripts launched using Utility: Launch Executable incorrectly report error	0.23.0.0
	NSPEC-7897	"Stage limits exceeded" warning appears when stage limits not exceeded	0.23.0.5
	NSPEC-7905	Setting Ranking Criterion in Cropped Images analyzer to Random does not have intended effect	0.23.0.4

44 issues