1. A method for automated review of defects detected in a defective die on the target substrate, the method comprising:

obtaining a results file that includes locations of the defects;

performing an automated review of the defects using an secondary electron microscope (SEM) so as to obtain electron-beam images of the defects;

performing an automated classification of the defects into types based on morphology of the defects as determined from the electron-beam images;

selecting defects of a specific type for automated energy-dispersive x-ray (EDX) review;

performing the automated EDX review on the defects of the specific type; and

generating a defect pareto that is a distribution of defect frequency by type, wherein the defect pareto combines morphological and elemental information by dividing defects of the specific type based on morphology of the defects into multiple types depending on elemental information.

2. The method of claim **1**, wherein performing the automated EDX review comprises, for each defect of the specific type:

movement to a defect site;

obtaining an EDX spectrum from the defect site;

movement from the defect site to a reference site;

obtaining the EDX spectrum from the reference site; and

generating a difference spectrum from the EDX spectrum from the defect site and the EDX spectrum from the reference site.

3. The method of claim 2, wherein the defect site is indicated to be in an array of repeating cells, and wherein the movement from the defect site to the reference site is performed by deflecting a primary electron beam by a cell dimension in one direction so that the reference site is at a location corresponding to the defect site in an adjacent cell.

4. The method of claim 2, wherein the defect site is indicated to be in a non-array patterned structure, further comprising:

electron-beam imaging to obtain a first image of area encompassing the defect site on the defective die;

electron-beam imaging to obtain a second image of an area encompassing the reference site on an adjacent die; and

determining a location of the reference site in the second image after aligning the second image to the first image.

5. The method of claim 4, wherein the movement from the defect site to the reference site is performed by translation of a stage holding the target substrate so as to move a field of view of the SEM from the defect site on the defective die to the reference site on the adjacent die.

6. The method of claim 2, further comprising:

deriving elemental information from the difference spectrum for each defect of the specific type.

7. The method of claim 1, wherein the defect pareto comprises a bar graph of defect frequency versus type.

8. An apparatus for automated review of defects detected on a target substrate, the apparatus comprising:

an electron beam column for generating a primary electron beam and focusing the primary electron beam onto a surface of the target substrate;

a moveable stage for holding the target substrate under the primary electron beam;

a deflector for deflecting the primary electron beam;

an electron detector for detecting secondary electrons emitted from the surface of the target substrate due to impingement by the primary electron beam;

an x-ray detector configured to detect x-rays emitted from the surface of the target substrate due to impingement by the primary electron beam; and

a control system comprising non-transient data storage for storing computer-readable code and data and further comprising a processor for executing the computer-readable code, wherein the computer-readable code comprises instructions to:

obtain a results file that includes locations of the defects detected in a defective die on the target substrate;

perform an automated secondary electron microscope (SEM) review of the defects so as to obtain electron-beam images of the defects;

perform an automated classification of the defects into types based on morphology of the defects as determined from the electron-beam images;

select defects of a specific type for automated energy-dispersive x-ray (EDX) review; and

perform the automated EDX review on the defects of the specific type; and

generating a defect pareto that is a distribution of defect frequency by type, wherein the defect pareto combines morphological and elemental information by dividing defects of the specific type based on morphology of the defects into multiple types depending on elemental information.

9. The apparatus of claim **8**, wherein the instructions to perform the automated EDX review further comprise instructions to:

move to a defect site;

obtain an EDX spectrum from the defect site;

move from the defect site to a reference site;

obtain the EDX spectrum from the reference site; and

generate a difference spectrum from the EDX spectrum from the defect site and the EDX spectrum from the reference site.

10. The apparatus of claim **9**, wherein the defect site is indicated to be in an array of repeating cells, and wherein the instructions to move from the defect site to the reference site comprises instructions to deflect a primary electron beam by a cell dimension in one direction.

11. The apparatus of claim **9**, wherein the defect site is indicated to be in a non-array patterned structure, and wherein the instructions to perform the automated EDX review further comprise instructions to:

use electron-beam imaging to obtain a first image of area encompassing the defect site on the defective die;

use electron-beam imaging to obtain a second image of an area encompassing the reference site on an adjacent die; and

determine a location of the reference site in the second image after aligning the second image to the first image.

12. The apparatus of claim **11**, wherein the instructions to move from the defect site to the reference site comprises instructions to translate the stage holding the target substrate so as to move a field of view of the SEM from the defect site on the defective die to the reference site on the adjacent die.

13. The apparatus of claim **9**, wherein the instructions to perform the automated EDX review further comprise instructions to:

derive elemental information from the difference spectrum for each defect of the specific type.

14. The apparatus of claim **8**, wherein the defect pareto comprises a bar graph of defect frequency versus type.

15. The method of claim **1**, wherein the defect pareto distinguishes between holes, scratches and particles and further distinguishes between fall-on particles of a first composition and fall-on particles of a second composition.

16. The apparatus of claim **8**, wherein the defect pareto distinguishes between holes, scratches and particles and further distinguishes between fall-on particles of a first composition and fall-on particles of a second composition.