

| Opportunity for Detection | Criteria: Likelihood of Detection by Design Control | Rank | Likelihood of Detection | Opportunity for Detection | Criteria: Likelihood of Detection by Process Control |
|--|--|------|-------------------------|--|---|
| No detection opportunity | No current design control; Cannot detect or is not analyzed. | 10 | Almost Impossible | No detection opportunity | No current process control; Cannot detect or is not analyzed |
| Not likely to detect at any stage | Design analysis/detection controls have a weak detection capability; Virtual Analysis (e.g., CAE, FEA, ect.) is not correlated to expected actual operating conditions. | 9 | Very Remote | Not likely to detect at any stage | Failure Mode and/or Error (Cause) is not easily detected (e.g. random audits) |
| Post Design Freeze and prior to launch | Product verification/validation after design freeze and prior to launch with pass/fail testing (Subsystem or system testing with acceptance criteria such as ride and handling, shipping evaluation, ect.). | 8 | Remote | Problem Detection Post Processing | Failure Mode detection post-processing by operator through visual/tactile/audible means |
| | Product verification/validation after design freeze and prior to launch with test to failure testing (Subsystem or system testing until failure occurs, testing of system interactions, etc.). | 7 | Very Low | Problem Detection at Source | Failure Mode detection in-station by operator through visual/tactile/audible means or post-processing through use of attribute gauging (go / no-go, manual torque check, clicker wrench, etc.) |
| | Product verification/validation after design freeze and prior to launch with degradation testing (Subsystem or system testing after durability test, e.g., function check). | 6 | Low | Problem Detection Post Processing | Failure Mode detection post-processing by operator through use of variable gauging or in-station by operator through use of attribute gauging (go/no-go, manual torque check/clicker wrench, etc) |
| Prior to Design Freeze | Product validation (reliability testing, development or validation tests) prior to design freeze using pass/fail testing (e.g., acceptance criteria for performance, function checks, etc.). | 5 | Moderate | Problem Detection at Source | Failure Mode or Error (Cause) detection in-station by operator through use of variable gauging or by automated controls in-station that will detect discrepant part and notify operator (light, buzzer, etc.) Gauging performed on setup and first-piece check (for set-up causes only) |
| | Product validation (reliability testing, development or validation tests) prior to design freeze using test to failure (e.g., until leaks, yields, cracks, etc.) | 4 | Moderately High | Problem Detection Post Processing | Failure Mode detection post-processing by automated controls that will detect discrepant part and lock part to prevent further processing |
| | Product validation (reliability testing, development or validation tests) prior to design freeze using degradation testing (e.g., data trends, before/after values, etc.). | 3 | High | Problem Detection at Source | Failure Mode detection in-station by automated controls that will detect discrepant part and automatically lock part in station to prevent further processing. |
| Virtual Analysis Correlated | Design analysis/detection controls have a strong detection capability. Virtual analysis (e.g., CAE, FEA, etc.) is highly correlated with actual or expected operating conditions prior to design freeze | 2 | Very High | Error Detection and/or Problem Prevention | Error (Cause) detection in-station by automated controls that will detect error and prevent discrepant part from being made. |
| Detection not applicable; Failure Prevention | Failure cause or failure mode can not occur because it is fully prevented through design solutions (e.g., proven design standard, best practice or common material, etc.) | 1 | Almost Certain | Detection not applicable; Error Prevention | Error (Cause) prevention as a result of fixture design, machine design or part design. Discrepant parts cannot be made because item has been error proofed by process/product design |