TRL	Level Description
1	**Basic principles observed and reported** This is the lowest level of technology readiness. Examples include literature review of a technology's basic properties No hardware or code has been created.
2	**Technology concept formulated** The technology has moved to a theory. Applications are speculative and there may be no proof or analysis to support assumptions. Potential experiments to test the innovation have been outlined but experimental data has not been collected.
3	**Technology proof of concept** Analytical and laboratory-scale studies physically validate predictions. Components are validated but there is not attempt to integrated components into a complete system. Modeling and simulation may be used to complement physical experiments.
4	**Component and/or system validation in lab environment** Basic technological components are integrated to establish that pieces will work together. This is the first step to determine whether individual components will work together as a system. Supporting information includes experiment results and how they differ from theoretical system performance goals.
5	**Laboratory scale, similar system validation in operational environment** Technology components are integrated so the system is similar to the final setup for high-fidelity, laboratory scale system testing. Supporting information includes lab scale testing results and how they differ from the operating system/environment.
6	**Engineering-scale model or prototype validation in operational environment** This is a step up from laboratory scale to engineering scale. The prototype should perform all functions required of the operational system. The testing environment should closely represent the actual operating environment. Supporting information includes model/prototype testing results and what they mean for the eventual operational system.
7	**Full-scale prototype demonstrated in operational environment** Actual system prototype demonstration under operational conditions. Supporting information includes full-scale testing results and what they mean for the operating system. Final design is virtually complete.
8	**Actual system completed and qualified through test and demonstration** Technology has been proven to work in its final form and under expected conditions. Supporting information includes operational procedures.
9	**Actual system operated over full range of conditions** Technology innovation has been successfully integrated and is being consistently used under operating conditions.