

TRL	
9 Technology complete and proven in actual operations over time.	Complete technology is scalable and proven to work in actual operations by several users over time
	Continuous development, improvement, optimization of technology and production is ongoing
8 Technology complete and demonstrated in actual operations	Complete technology has been proven to work in actual operations by first users
	Complete technology = Complete - contains everything the user needs to use it; Functional - everything works the way it should for the user to solve their problem/need; Compatible - compatible with people, processes, goals, infrastructure, systems, etc. at the user; Producibile - possible to produce at a reasonable cost
	Proven to work = meet all performance requirements/specifications
	Actual operations = implemented by end-users on their own in their day-to-day operations
7 Technology prototype demonstration in operational environment	Prototype near or at the complete technology has been shown to actually work in an operational environment
	Operational environment = environment that addresses all the operational requirements and specifications where the technology will be used by the end-users
	Complete end-user requirements/specifications and/or use cases in place
6 Technology prototype demonstration in relevant environment	Representative model or prototype of the technology has been shown to actually work in a relevant environment
	Representative model = a functional form of the technology, generally reduced in scale, near or at operational specification
	Prototype = the technology in a form that can be used to evaluate the technical and/or manufacturing feasibility or utility of the final product
	Shown to actually work (i.e. demonstration) = meet most of the important performance requirements
5 Technology validation in relevant environment	Basic components are integrated and tested in a more realistic form in a relevant environment
	Test results give evidence indicating that the technology will work (i.e. validation)
	Relevant environment = lab or other controlled environment that simulates the most important and most stressing aspects of the operational environment
	More defined end-user requirements/specifications and/or use cases based on feedback from users
4 Technology validation in laboratory	Basic components are integrated and shown to work together and produce desired results in the laboratory environment
	Test results give initial evidence indicating that the technology concept will work (i.e. initial validation)
3 Proof-of-concept of critical functions and/or characteristics in laboratory	Tests in the laboratory environment (analytical and/or experimental) of important parameters/features/functions show that the technology concept could work and be feasible
	Laboratory environment = the environment where technology is typically developed, often not the same environment as where it will be used
	Active R&D is initiated to develop the technology further
	There is a first idea of end-user requirements/specifications and/or use cases
2 Technology concept and/or application formulated	A potential technology concept is defined and described.
	Practical applications can be defined/researched but are speculative, and no proof or detailed analysis that the technology will work.
1 Interesting research results or initial technology idea identified	Research results with potential benefits or useful applications identified
	Vague idea of a technology to be developed