

Technology Readiness Level (TRL) DEFINITION:

TRL	Development Stage Completed	Definition of Development Stage
0	Unproven concept (Basic R&D, paper concept)	<ul style="list-style-type: none"> Basic scientific/engineering principles observed and reported; paper concept; no analysis or testing completed; no design history
1	Proven concept (Proof of concept as a paper study or R&D experiment)	<ul style="list-style-type: none"> Technology concept and/or application formulated Concept and functionality proven by analysis or reference to features common with/to existing technology No design history; essentially a paper study not involving physical models but may include R&D experimentation
2	Validated concept (Experimental proof of concept using physical model tests)	<ul style="list-style-type: none"> Concept design or novel features of design is validated by a physical model, a system mockup or dummy of functionally tested in a laboratory environment; no design history; no environmental tests; materials testing and reliability testing is performed on key parts or components in a testing laboratory prior to prototype construction
3	Proto type tested (System function, performance and reliability tested)	<ul style="list-style-type: none"> Item prototype is built and put through (generic) functional and performance tests; reliability tests are performed including; reliability growth tests, accelerated life tests and robust design development test program in relevant laboratory testing environments; tests are carried out without integration into a broader system The extend to which application requirements are met are assessed and potential benefits and risks are demonstrated
4	Environment tested (Pre-production system environment tested)	<ul style="list-style-type: none"> Meets all the requirements of TRL 3; designed and built as production unit (or full scale prototype) and put through its qualification program in simulated environment (e.g. hyperbaric chamber to simulate pressure) or actual intended environment (e.g. subsea environment) but not installed o operating; reliability testing limited to demonstrating that prototype function and performance criteria can be met in the intended operating condition and external environment

5	System tested (Production system interface tested)	<ul style="list-style-type: none"> Meets all the requirements of TRL 4; designed and built as production unit (or full scale prototype) and integrated into intended operating system with full interface and functional test but outside the intended field environment
6	System installed (Production system installed and tested)	<ul style="list-style-type: none"> Meets all the requirements of TRL 5; production unit (or full scale prototype) built and integrated into the intended operating system; full interface and function test program performed in the intended (or closely simulated) environment and operated for less than 3 years; at TRL 6 new technology equipment might require additional support for the first 12 to 18 months
7	Field proven (Production system field proven)	<ul style="list-style-type: none"> Production unit integrated into intended operating system, installed and operating for more than three years with acceptable reliability, demonstrating low risk of early life failure in the field