S100 Working Group 4

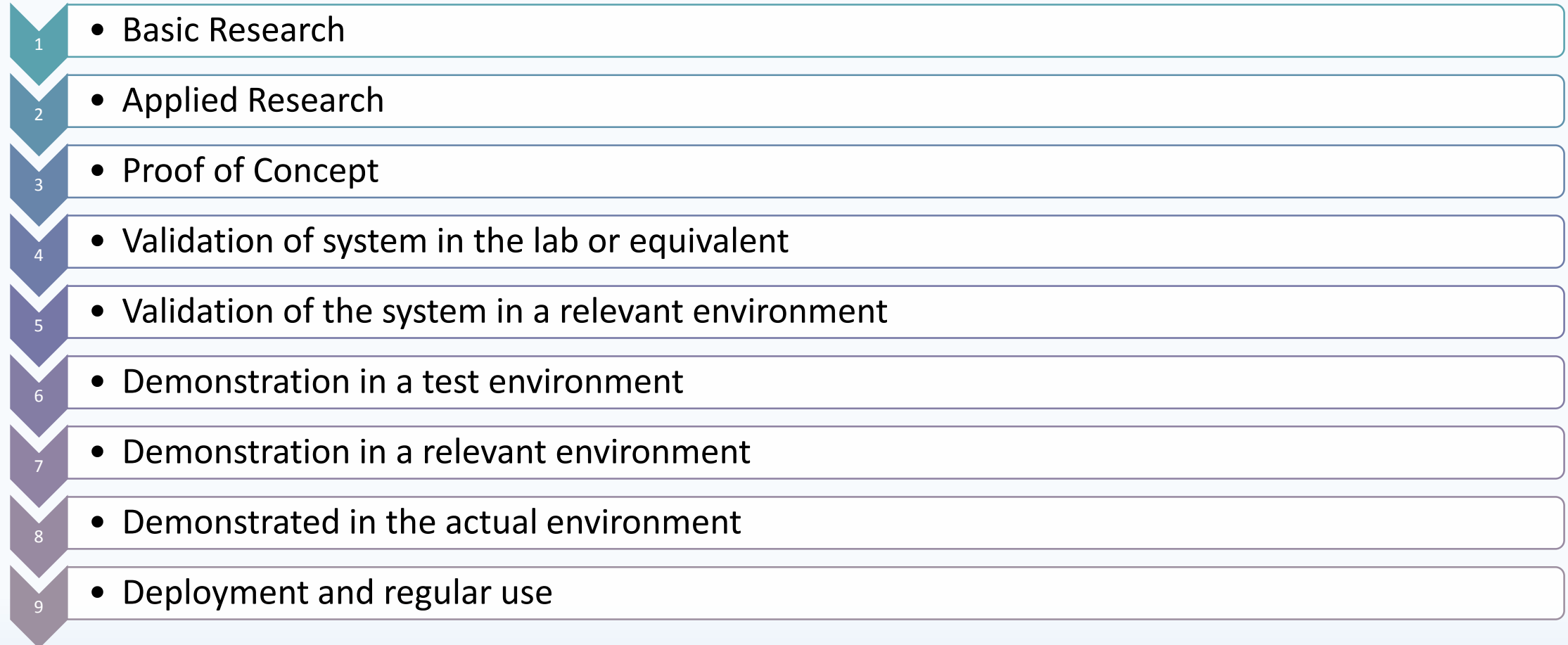# S100WG-6.1 S-100 Readiness Levels

Introduction

- Concept is based on NASA's Technical Readiness Levels
- Describes to progression of an idea from research to a product in regular use

Technical Readiness Levels

1. • Basic Research
2. • Applied Research
3. • Proof of Concept
4. • Validation of system in the lab or equivalent
5. • Validation of the system in a relevant environment
6. • Demonstration in a test environment
7. • Demonstration in a relevant environment
8. • Demonstrated in the actual environment
9. • Deployment and regular use

Analysis/Discussion

- Why S-100 Readiness Levels?
  - Communicate to the wider community
    - completeness of the specification
    - Readiness for operational use
  - Common picture of what is required for different types of specifications
    - Tailored for different operational settings as not all specifications require all S-100 components
  - Will show a clear progression from an idea to regular use of the product
  - Shows a clear understanding if the specification is ready for endorsement and approval
  - Allows non-IHO stakeholder organizations to gauge when their development meets an appropriate readiness level for transition to live operation

S100 Readiness Levels

- S100 Readiness does not require the full 9 readiness levels

- Instead seeks to map nine TRLs into five S-100 Readiness Levels

- Allows developers to determine what is needed depending upon what the use scope is for the end product
  - Products for use in navigation systems require more components

Readiness Levels

Required product specification component	(TRL5) Level 1 v1.0.0	(TRL6) Level 2 v1-2.0.0	(TRL7) Level 3 >v2.0.0	(TRL8) Level 4 >v2.0.0	(TRL9) Level 5 >v2.0.0
Main Document (Defines the relevant parts of S-100 that are required for the product specification)	X	X	X	X	X
A Default Encoding	X	X	X	X	X
S-100 Compliant Feature Catalogue	X	X	X	X	X
DCEG	X	X	X	X	X
S-100 Compliant Portrayal Catalogue NOTE: Not every specification will need a portrayal catalogue – this should be determined as part of the development process and stakeholder feedback		X	X	X	X
Data Quality Checks		X	X	X	X
Test Data Sets		X	X	X	X
Data Validation (and test datasets)		*X*	*X*	*X*	*X*
Exchange Catalogue		X	X	X	X
Encryption / Digital Signatures			X	X	X
Interoperability				X	X[1]
Alerts and Indications				X	X[1]
Operational data					X

S100 Readiness Levels

- Level 1: Contains the minimum amount of components needed to comment the development of test datasets and system prototypes. This should be considered the final stage of development before demonstration begins. and would typically be Edition 1.0.0 of a Product Specification

- Level 2: Includes additional items such as data quality checks and test data sets so that the product specification can be demonstrated in prototype environments. This would typically map to Edition 1.n.n - 2.0.0 of a product specification. Depending on the end-user requirements of the product specification, Level 2 can be implemented in an operational context. Subsequent S-100 Readiness Levels are then dependent on operational requirements of the product within navigation systems.

S100 Readiness Levels

- Level 3: Builds on level 2 and includes a fully featured and documented exchange catalogue's and (optionally) an encryption layer for the data and implementing system. At this level prototype systems, products or processes should be demonstrated in a real world environment.

- Level 4: Intended only for use in vessel navigation systems such as ECS and ECDIS. At this level the developer of the product specification needs to ensure that documented considerations have been given to interoperability via S-98 and alerts and indications functionality. At this level there should be a baselined and compliant system, process or product that is shown to operate or function as expected.

- Level 5: System, process or product is deployed and used routinely. At this stage data and compliant systems are readily available for operational use.

Action Required of the S100WG

- The S100WG is invited to:
  - a. endorse the concept of S-100 Readiness Levels (SRL)
  - b. agree to propose this concept to HSSC for inclusion into S-97 and delegate to the S100WG to implement and develop a compliance scheme.

S-97

What is S-97

- S-100 :
  - 15 Parts
  - Over 400 Pages

- Needed additional guidance for developers of product specifications

- Ensures specification harmonization

S-10X PRODUCTS AND SERVICES

What is S-97

- Contains Three Parts

- **Part A** – **In depth Description of the various components of S-100**

- **Part B** – **Describes the typical steps and activities needed to create a product specification**

- **Part C** – **Describes the data quality measures used in S-100 specifications**

Progress to Date

- Sent out for comment in fall 2018

- Received comments from IHO Registry Manager

- Mainly editorial in nature

- Working Group Options
  - Adjudicate the comments, OR
  - Allow the chair to convene an editorial group to work with the IHO Registry Manager to resolve the comments

Action required of the S100 working group

- The S100WG is requested:
  - Endorse S-97 for Edition 1.0.0 (pending resolution of IHO Secretariat comments)
  - Submit S-97 Edition 1.0.0 for HSSC approval
  - Continue to refine S-97 utilizing the new guidance under 2/2007
    - Improve readability
    - Update S-100 Part 11 (or propose to remove Part 11 in favor of S-97)