

No	COMPETENCY LIST	Time (Mins) <i>Note 7</i>	ISI	SISI	AS/NZ 3788 Reference (or other noted)
1. PLANNING AND PREPARING FOR INSPECTION					
1.1	Understand the objectives of Inspection and roles of In-service Inspectors.	15	√	√	2.1 & Fig. 1.1
1.2	Understand the elements of Inspection within the typical plant integrity life cycle.	5	√	√	2.2
1.3	Understand the process of inspection, Inc types and stages of Inspection.	5	√	√	2.3 & 4.2
1.4	Select, interpret and apply relevant information from specific Standards, Acts, Regulations or codes of practice related to PE.	25	√	√	1.1 & 1.3 (Appendix A)
1.5	Understand the inspector's responsibilities to customer, employer and WHS legislation relating to inspection for competencies applied in the field and vice versa.	40	√	√	3.2 & 5.1.2
1.6	Understand and apply the agreed AICIP Code of Ethics and Principals.	10	√	√	Refer AICIP Website
1.7	Respond and act appropriately to unexpected situations of responsibility or competency in the field.	15	√	√	1.7,1.8, & 3.2.1
1.8	Identify and possess the appropriate physical and mental capabilities required by the employer for tasks involved with In-service Inspection.	5	√	√	3.2.1, SAA/SNZ - MP76
1.9	Have eyesight to permit reading reports and performing visual inspection. (Visual acuity and colour perception to a suitable industry standard – e.g. AS 3978 Section 4)	5	√	√	3.2.1 Appendix V Sec 10
1.10	Understand, interpret and apply customer and contractual inspection requirements – particularly type, scope, timing and any effects or impact of work.	5	√	√	1.2 & 2.3
1.11	Communicate effectively with customer and other relevant bodies by means such verbal, writing, sketch's, typed reports, photo's, electronic media, sample means.	15	√	√	2.3 & 3.2.2 (d)
1.12	Determine if changes, repairs, alterations, malfunctions or incidents have occurred on the equipment since the previous inspection and understand the most suitable path forward for compliance.	20	√	√	6
1.13	Understand how to develop an appropriate inspection and test plan (ITP) for activities related to PE, such as repairs. See also items 1.14 and 1.15).	30	√	√	3.1 & 3.3
1.14	Identify where and when inspection and testing is required to identify potential flaws, features or properties.	30	√	√	Table 4.1 & referenced sections
1.15	Select the inspection and test methods for particular inspection with any special requirements or key indicators in testing.	30	√	√	Appendix D
1.16	Select and check inspection documents and equipment.	5	√	√	3.2.2 & App.C3
1.17	Understand risk management, risk assessment principles and main features of Risk Based Inspection Plans or Processes.	40	√	√	1.5, 4.5 & App B
1.18	Determine pressure equipment hazards and determine hazard levels from AS 4343. Calculate hazard levels.	60	√	√	3.1,3.3,4,6.2,8.1, 8.5,8.6 AS/NZS 4343
1.19	Understand quality assurance and conformity assessment principles related to PE manufacture, installation, repairs.	60	√	√	Appendix V, 6, & AS/NZS 3920
1.20	Plan and perform an audit on pressure equipment and inspection activities.	40	√	√	8, Appendix V, AS 3873, MP76
1.21	Upgrade knowledge and skill for intended inspection for specific industry or plant.	10	√	√	3.2.1 as needed
1.22	Understand, identify and have access to essential inspection equipment and necessary PPE.	20	√	√	Appendix D
1.23	Understanding of basic physics, chemistry and properties of materials used and processed in PE.	120	√	√	Research relevant industry information
1.24	Understanding of PE types, functions, size, design, materials,	180	√	√	Research relevant

	manufacture, operating conditions and terms.				industry information AS/NZS 3788	
1.25	Ability to interrogate related data and information from different sources at different times relative to all stages of the life of pressure equipment.	140	√	√	Research relevant industry information AS/NZS 3788	
1.26	Recognise the suitable preparations for inspection activities, including access, lighting, surface conditions or necessary surface preparations. Identify limitations, notes and actions.	30	√	√	Research relevant industry information AS/NZS 3788, D4	
	2. CONDUCTING INSPECTION (to ITP in item 1.13)					
2.1	Ascertain authority to inspect and identify equipment.	5	√	√	2.3, 3.1(l,n)	
2.2	Check conditions for safe access to PE and the plant.	5	√	√	3.1(l,n) & Appendix C	
2.3	Follow WHS safe working procedures and practices; employer and Owner/User requirements.	5		√	3.2.2(e) & Appendix C	
2.4	Visual Inspection (VT) (including measurement, gauging and observation including such as, touch, smell, sound, taste, pit depth and corrosion/erosion assessment). Includes skill in Remote Video Inspection as also detailed in 2.16	25	√	√	Appendix D6 Research relevant industry information procedures, AS/NZS 3788 for sub tasks	
a	Identify the common surface signs and specific typical locations to search.		√	√		
b	Understand principle and methods and use, draw up the Procedure.	5	√	√		
c	Draw up the procedure/test. Understand limits of inspection	5	√	√		
d	Record and report results.	10	√	√		2.3 & 8
e	Verify, understand and assess results; recommend action	20	√	√		5
2.5	Materials Identification (PMI) (Visual, magnetic, properties, spectrograph, matl references etc.)				Appendix D14.1 Research relevant industry information procedures and understand findings	
a	Draw up the procedure (Visual magnetic)	10	√	√		
b	Draw up the procedure/test. Understand limits of tests	20	√	√		
c	Record and report results (Visual magnetic)	10	√	√		
d	Verify, assess results and recommend action.	10	√	√		
2.6	Ultrasonic Thickness Testing (UTT)				Appendix D7 Research relevant industry information procedures and understand findings	
a	Understand the basic principles of the technique and its use	10	√	√		
b	Perform the procedure/test. Understand limits of inspection	15	√	√		
c	Record and report results	10	√	√		
d	Verify, interpret, assess results and recommend action.	10	√	√		
2.7	Penetrant Testing (PT) (Basic Features)				Appendix. D11 Research relevant industry information procedures and understand findings	
a	Understand the basic principles of the technique and its use	10	√	√		
b	Perform the procedure/test. Understand limits of inspection	15	√	√		
c	Record and report results	10	√	√		
d	Verify, interpret, assess results and recommend action.	10	√	√		
2.8	Magnetic Particle Testing (MT) (Basic Features)				Appendix. D10 Research relevant industry information procedures and understand findings	
a	Understand the basic principles of the technique and its use	10	√	√		
b	Perform the procedure/test. Understand limits of inspection	5	√	√		
c	Record and report results	10	√	√		
d	Verify, interpret, assess results and recommend action.	10	√	√		
2.9	Radiography (RT) (Basic Features)				Appendix D8 Research relevant industry information procedures and understand findings	
a	Understand the basic principles of the technique and its use. Understand limits of the inspection.	10	√	√		
b	Verify radiographs and report comply with specified requirements (Interpretation is not a requirement)	10	√	√		
c	Verify, understand, assess results and recommend action.	15	√	√		
2.10	Ultrasonic Testing (UT) (Basic Features)				Appendix D9 Research relevant industry information procedures and understand findings	
a	Understand the basic principles of the technique and its use. Understand limits of inspection.	10	√	√		
b	Verify, understand, assess results and recommend action.	15	√	√		
2.11	Eddy Current Testing (ET) (Basic Features)				Appendix D13	

a	Understand the basic principles of the technique and its use. Understand limits of inspection.	10	√	√	Research relevant industry information procedures and understand findings
b	Verify, understand, assess results and recommend action	15	√	√	
2.12	Thermographic Inspection (IRT) (Basic Features)				Appendix D12
a	Understand the basic principles of the technique and its use. Understand limits of inspection	10	√	√	Research relevant industry information procedures and understand findings
b	Verify, understand & assess results and recommend action.	15	√	√	
2.13	Other NDT eg ACFM, AET - including advanced NDT or inspection techniques including suitable adaptations for specific circumstances.	30	√	√	Refer AINDT
2.14	Metallurgical Tests - Including Microscopy, Replication				Appendix D14
a	Understand the basic principles of the technique and its use. Understand limits of inspection	10	√	√	Research relevant industry information procedures and understand findings
b	Verify, understand & assess results and recommend action.	15	√	√	
2.15	Material Hardness Testing (HT)				Appendix D14.2
a	Understand the basic principles of the technique and its use. Understand limits of inspection	10	√	√	Research relevant industry information procedures and understand findings
b	Verify, understand & assess results and recommend action.	15	√	√	
2.16	Mechanical and Destructive Tests i.e. Tensile, Bend, Charpy				Appendix D19
a	Understand the basic principles of the technique and its use. Understand limits of inspection	10	√	√	Research relevant industry information procedures and understand findings
b	Verify, interpret, assess results and recommend action	15	√	√	
2.17	Remote Visual Examination (RVI): Intrasopes, Magnified viewing, Mirrors, Fibre Optics Methods or Portable Television/Cameras				Research relevant industry information procedures and understand findings
a	Understand	10	√	√	Research relevant industry information procedures and understand findings
b	Perform the procedure - mirror only	15	√	√	
c	Record and report results	10	√	√	
d	Verify, understand & assess results and recommend action.	15	√	√	
2.18	Pressure Testing (Hydrostatic & Pneumatic)				Appendix D15, D16, D17
a	Understand	10	√	√	Research relevant industry information procedures and understand findings
b	Perform or witness the procedure	15	√	√	
c	Record and report results	10	√	√	
d	Verify, understand & assess results and recommend action.	15	√	√	
2.19	Leak Tests: (Soapy Water etc.)				Appendix D18
a	Draw up the procedure	10	√	√	Research relevant industry information procedures and understand findings
b	Perform the procedure	15	√	√	
c	Record and report results	10	√	√	
d	Verify, understand & assess results and recommend action.	15	√	√	
2.20	Understand and interpret Pressure Equipment drawings including design, workshop, installation, process, piping and instrumentation diagrams	15	√	√	Research relevant industry information
2.21	Identify Hazards related to the Pressure Equipment see also 1.17	15	√	√	Appendix B
2.22	Carry out basic Risk Assessment and make recommendations to the Owner/User. Understand Risk Based Inspection.	35	√	√	Appendix B & 1.5, 4.5
2.23	Perform Basic Design Calculations to determine a) Minimum required thickness of cylindrical PE, (including determination of calculation pressure, design temperature and design strength) b) Acceptability of equipment condition c) Remaining life of general or pitted corroded PE. d) Remaining life of PE subject to fatigue and creep e) Remaining life understanding rate of exhaustion and effect of service conditions with effective rates f) Re-rating of working pressure of temperature	35 Note 6	√	√	5 & 6 Reference Design Standards eg. AS1210, AS 4041 or AS1288 5.3 5.4 & 6.3
2.24	Advice on Repairs, Replacement and Alterations a) Recommend Where, When and Why these are required.	65 Note 6	√	√	6.1 & 6.2

	b) Recommend corrective action method or methods of extending life (including coatings, linings or change of conditions). c) Assess the reported results and recommend action.				
2.25	Advise on Re-rating a) Recommend When and why this is required. b) Provide basis and any conditions for recommended re-rating.	35 Note 6	√	√	6.1 & 6.3
2.26	Carry out the inspection required on equipment at the Installation or Commissioning stage to ensure compliance with AS/NZS 3788 i.e.. no damage, correct accessible name plates, stamping, supports, earthing, protective devices and any required site leak testing.	35 Note 6	√	√	4.2 & AS 3892
2.27	Carry out on-stream inspection and tests on equipment (in operation) to detect any malfunction needing inspection. Includes recognition in relevant surface signs	35	√	√	4.3
2.28	Carry out the Periodic Internal and External Inspection in accordance with AS/NZS 3788.	85	√	√	4.4 & Table 4.1
2.29	Perform final inspection and tests on changes, repairs, alterations and replacements.	35	√	√	6, AS 3920
2.30	Investigate Deterioration and Failures a) Obtain and document data for analysis b) Identify modes and causes of deterioration and failures c) Determine acceptability or remaining life d) Recommend action	85	√	√	Research relevant industry information 5,7, 7.2.2 Appendix. M,N,O,U 7.3
2.31	Apply the above competencies to each specific type of Pressure Equipment listed below and as detailed in AS/NZS 3788 Table 4.1 (no specific order)				Research relevant industry information
a	Boilers	35	√	√	Appendix F Appendix Y
b	Unfired Pressure Vessels - Stationary, process, storage and air receivers - Auxiliary vessels - Buried and mounded	35	√	√	Appendix. G 4.11 Appendix. R
c	Transportable Pressure Vessels	35	√	√	Appendix. E
d	Transportable Drums for Liquefied Gas	35	√	√	Appendix. W
e	Steam Vessels and Deaerators	35	√	√	Appendix. S
f	Heat Exchangers, Coolers, Condensers	35	√	√	Appendix. H
g	Fired Heaters and Hot Water Heaters	35	√	√	Appendix. J
h	Pressure Piping	35	√	√	Appendix. I
i	Vessels with Quick-Actuating Closures & Swing Bolt doors	35	√	√	Appendix. Q
j	Idle Pressure Equipment	35	√	√	Appendix L & 4.5
k	Storage Tanks to ANSI/API 620 or equivalent	35	√	√	Appendix T
l	Pressure Relief Devices	35	√	√	4.6, Appendix. P&X
m	Controls Critical for Safety	35	√	√	4.7, F5
n	Adjacent and associated plant and controls – Identify typical examples eg Fans, pumps etc.	35	√	√	Research relevant industry information
o	Heritage Boilers and PV	35	√	√	Appendix Y
p	Low Temp PE	35	√	√	Research relevant

					industry information
	3. ASSESSMENT OF INSPECTION				
3.1	Understand the basis and concept of Fitness for Service and application to integrity of in-service plant	25		√	5.1 & 5.2
3.2	Identify indications and signs that effect integrity of PE	25		√	Research relevant industry information
3.3	Understand the effect and investigate failure modes and damage mechanisms on plant. Address concepts in: -limits allowed for new construction -engineering critical assessment, fracture mechanics -proven appropriate experience -Risk Based Inspection technique and application	95		√	5.2.2 & Appendix M,N,O,B AS 4037 AS 4458
3.4	Awareness to the rates of degradation and acceptability of defects including size of flaws. Estimate remaining safe life and failure life (wastage, creep, fatigue)	35		√	Appendix U,M,N,O
3.5	Apply sound philosophy to monitoring operational plant identified with damage/degradation. Assess suitability until next proposed inspection in AS/NZS3788 and other suitable dates.	85		√	AS/NZS 3788 Research relevant industry information
3.6	Recognise the responsibility to maintaining integrity of plant for service	45		√	Research relevant industry information 4.4
3.7	Identify and understand the effect of the common failure mechanisms listed but limited to below:				
a	Thinning	25		√	5.2.4
b	Corrosion	35		√	Appendix M, N
c	Crack and crack like defects	25		√	5.2.5
d	Dents	15		√	5.2.7
e	Leakage	15		√	5.2.9
f	Deformation of surfaces	15		√	5.2.10
g	Structural support	15		√	Appendix Z
h	Metallurgical Damage	35		√	5.2.8
	4. REPORTING ON INSPECTION				Appendix Y
4.1	Record and report results	30	√	√	2.4, 8, 7.3 Appendix. K & P
4.2	Maintain registers, essential references and history files	15	√	√	8.2, 8.3, 8.4
4.3	Ensure secure, up-to-date, accessible filing for retrieval	10		√	8.1
4.4	Recommend future inspection, testing and surveillance programs	20		√	2.4
	5. INSPECTION MANAGEMENT				
5.1	Select and train inspection staff	30		√	ISO/IEC 17020 & Research relevant industry information
5.2	Instruct, supervise staff and review their performance and development	25		√	
5.3	Develop and implement systems of technical control for inspection	60		√	
5.4	Liaise and present to owners of PE information to establish sound and effective Management and Inspection Strategies	20		√	
5.5	Audit management systems and inspection processes related to PE	30		√	
5.6	Provide advice and leadership within inspection teams	15		√	

NOTES

1. For Boilers, Pressure Vessels and Pressure Piping with inspection to AS/NZS 3788 Pressure Equipment – In-Service Inspection. For inspection in AU and countries where English is normally used or acceptable, competency in English is also read.
2. Competencies are given for two levels of inspection i.e.. “Inspector” and “Senior Inspector”. For “Inspector” level there are three main elements of competency (1, 2, 3 in above Table) and four for “Senior Inspectors” (1, 2, 3 & 4) with each element having a number of detailed competencies. These are expressed in a manner to align with:
 - a) “performance criteria” in AS/NZ 4481 by indicating the level of quality of work performance required; and
 - b) the “evidence guide” by indicating the form of examination e.g. “understand” means the examination will be based largely on written or oral knowledge and the skill to communicate this; while “demonstrate”, “report” or “perform” means assessment will be based on performance e.g. of visual inspection, thickness measurement, developing an inspection plan or final report; and “verify” is intended to mean that the inspector is assured that the reports, tests, etc. are correct e.g. by authorised bodies, persons and not necessarily by repeating or witnessing the tests.
 - c) The numbers in Columns 3 and 4 give an approximate guide, in minutes, to the coverage of various competencies in 3 ISI and 2 SISI exams based on experienced engineer, tradesperson or technician currently having experience with PE. About 50% more time might be needed for a refresher training course and directly associated study They are intended as a general guide to the relative extent or level of AICIP assessment of various competencies in AICIP exams. These times are based on candidates having prior competencies, qualifications, training, experience, mentoring and other assistance as described in current guideline documents provided by AICIP on the website.
 - d) It is noted that in preparation of training and roles within the inspection industry for certain roles this list may not be exhaustive to contribute to certain competencies and other references maybe required. This guide is provided for the key competencies assessed by AICIP in the examination and certification process and is not limited.
3. The numbers represented in column 6 refers directly to AS/NZS 3788: 2006 clause or appendix only, unless otherwise noted. Other references maybe required in those clauses to provide additional guidance.
4. Not all but at least 70% of listed competencies or their elements will be assessed by application and examination. The above Table and exams do not cover other competencies often essential for some inspection e.g. holding of a confined space permit or gas testing certificate, both of which are the responsibility of the inspector and employer or PE owner-user, and evidenced by a wallet card etc. Other competencies not covered include ability to work alone or in team, or resolution of finances, insurance, taxation or legal issues.
5. The time expressed in minutes allocated here is the suggested allocation to review the competency subject in preparation for assessment, examination and as applied to tasks specific to inspection industry. The time is a guide only for candidate’s and trainers and can vary depending on experience and knowledge of individuals and is based on individuals having some initial exposure the subjects.

Main Referenced Standards key to In-service Inspection

AS/NZ 3788	Pressure Equipment – Inservice Inspection
AS/NZ 3920	Pressure Equipment - Conformity Assessment
AS/NZ 4343	Pressure Equipment – Hazard Levels
AS 3892	Pressure Equipment – Installation
AS 4458	Pressure Equipment – Manufacture (also other specific standards such as AS1210, AS 4041, AS 1228)
AS 3873	Pressure Equipment – Operation and Maintenance
SAA/SNZ MP76	Pressure Equipment – Inspection bodies and personnel

Further references are included in AS/NZS 3788 Appendix A