Managing Competence in Naval Asset Management: Professionalising Defence's Cadre of Asset Managers for Ships and Submarines

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Abstract Defence's sustainment policy for naval vessels incorporates asset management principles and methods and recognises the need for experts who specialise in asset management as essential to delivering and maintaining maritime capability. For warships and submarines, asset managers constantly weigh technical challenges and costs of maintenance and modernisation against operational and functional benefits to meet the Operating and Support Intent, life cycle management objectives and Seaworthiness requirements. A naval asset management skills model has been developed that focusses on technical compliance, operational capability, and business-related goals intrinsic to Fleet Life Cycle Management. Naval enterprise sustainment efforts are a combined endeavour between Navy, Australian Public Service and defence industry contractors but has no identified or documented minimum asset management capabilities for life cycle management of either individual vessels or entire classes. While Defence acknowledges the need for asset management within the naval enterprise, it has not established criteria for codifying or formally recognising required competencies directly related to life cycle management of naval vessels. National recognition and professional certification formally credits the learning, development and experiential requirements each warship and submarine life cycle management professional should have as a means to become officially sanctioned asset management specialists within Defence's maritime sustainment community. Moreover, the nature of naval vessel asset management necessitates formal recognition within Capability and Acquisition Sustainment Group's Sustainment Management Career Pathway as well as accreditation through the Australian Quality Framework. The US Navy's Port Engineer Program provides a solid example on which Australia's naval enterprise can base its own scheme. This paper outlines a method to recognise naval asset management specialists by codifying ex-

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perience, education, and training requirements for inclusion in Defence's Sustainment Management Professionalisation and Certification Framework and provides recommendations for establishing a valid career path for Warship and Submarine Life Cycle Managers.

1 Introduction

After nearly a decade of research investigating ship maintenance practices and continual improvement activities, Defence's Capability and Acquisition Sustainment Group (CASG) formally identified asset management as a core competency for sustainment of Defence materiel. CASG has mandated that sustainment efforts must align to internationally recognised asset management methods, principles and practices contained in the ISO 5500X series (CASG 2017). Asset management specialists are key personnel who should be accountable for delivering capability across a warship's life cycle (CoA 2016). Australia's national naval enterprise needs competent professionals to specialise in life cycle management of naval ships. The Asset Life Cycle Manager (ALCM) concept contends that competent maritime professionals should be assigned as dedicated individuals responsible for managing a specific Royal Australian Navy (RAN) ship (i.e. surface ship or submarine) on a long-term basis; ALCMs are key elements in the Fleet Life Cycle Management (FLCM) concept (Lemerande 2018b). The ALCM competency model, shown in Figure 1, incorporates best practices from asset management academia and practitioners, commercial ship management and existing programs used by the United States Navy (USN) and United States Coast Guard (USCG) (Lemerande 2018a).

CASG's Sustainment Management Professional Competency Framework (SMPCF) provides an appropriate method for articulating the career path, competencies and qualifications for asset management generalists within Defence (DMO 2014) but it fails to provide the necessary constituent components and factors ALCMs require for life cycle management of a modern naval ship. As a high-level document, the SMPCF provides guidance and requires nondescript sustainment managers to undertake generic competency-based asset management training that can be applied to facilities and infrastructure, land vehicles, utilities, aircraft or any other item categorised as a Defence asset. Warships and submarines represent arguably the most complex and expensive assets within the Australian Defence Force (ADF). Each ship is an intricate and complex system of systems designed to operate in harsh and wide-ranging maritime environments. Each RAN ship is expected to deliver full capability across a 30-40 year service life. Asset management training, qualifications and certifications listed in the SMPCF is woefully inadequate for ALCMs charged with life cycle management of a warship or submarine. A more comprehensive program that addresses competency requirements is needed within CASG's framework. Professionalising ALCMs using elements identified in the competency model could easily be added to the SMPCF. This will formally identify

experience, expertise, training, qualifications and certifications needed to document competence for such an important position.

Establishing an ALCM program based on the USN Port Engineer Program (PEP) but tailored to meet naval enterprise needs, would establish an irrefutable world-class qualification that will absolutely deliver greater value to Australia's national naval enterprise. The USN formalised its PEP to establish a rigorous program that is both objective and demanding. It is a proven and effective model that can be tailored by Defence and implemented in Australia to meet CASG and RAN asset management needs. This paper proposes the professionalisation of ALCMs using the competency model as the foundation and the USN's highly successful PEP as a proven model that can be used as the cornerstone for a program in Australia. A brief discussion covering the competency model is provided to explain ALCMs' knowledge domains, areas of expertise and cognitive abilities. Elements covering education, experience, credentialing and qualifications that contribute to the professionalisation of ALCMs is then discussed for consideration. The paper concludes with recommendations as to how Defence can incorporate professionalising the ALCM cadre into the SMPCF for asset management specialists.

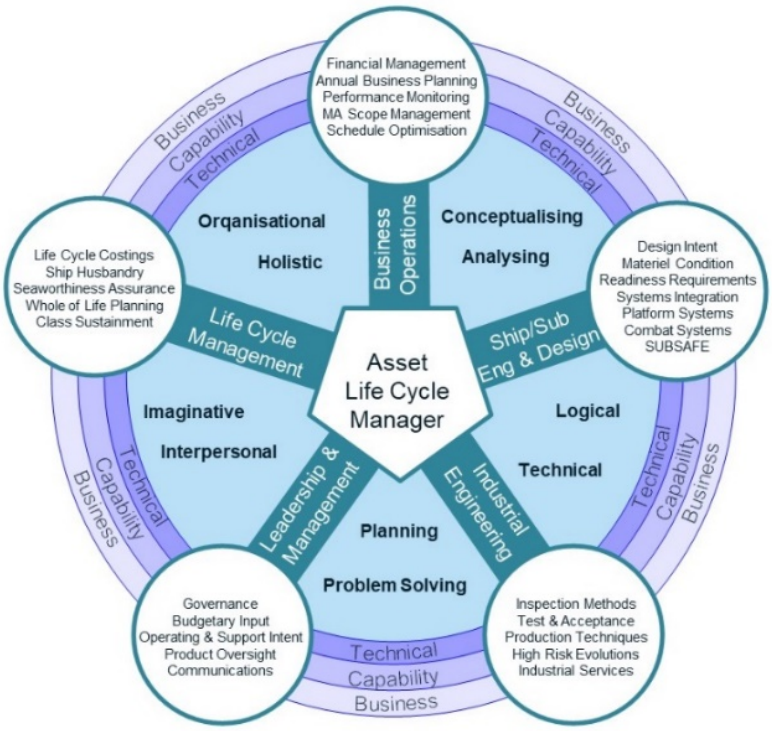

Figure 1: Competency Model for Naval Enterprise Asset Life Cycle Managers

2 Competencies

Competencies are a “collection of qualities, abilities, skills and other capacities of the staff needed for successful performance” (Skorkova 2016) in an associated role. Competency models are developed from the identified competencies. An asset manager must have competence in engineering and technical specialties associated with the assets as well as being a competent business manager that can provide clear direction through financial awareness and adept communication skills. Persons responsible for life cycle management require knowledge across technical, business and asset management related aspects that can meet the enterprise’s asset-related needs (Hastings 2015). Competence related requirements in ISO 55001 ensure that individual asset management positions are filled by people who have the knowledge, skills and behaviours to perform their duties and can actively demonstrate those attributes to fulfil requirements needed in specific asset management roles (AMC 2014). Strategic asset managers apply engineering, strategic management and financial skills to develop, plan and maintain assets in an economically responsible and sustainable manner over the assets’ life cycles. The ALCM concept aligns closely to stewardship theory for asset management in that it includes specific aspects of asset governance and oversight. As front-line technical life cycle management experts, ALCMs could easily fill the strategic asset manager role for a naval ship. These persons are expected to be highly trained and skilled and exhibit a wide-range of competencies across various specialty areas.

Competence is critical to achieving a state of professionalism which is characterised as specialised expertise and an ideological approach to the work that is “based on clear principles, including a commitment to the interests of the client” (Mills 2014) with individuals being paid for full-time work in that specialty. Competence management requires the appropriate combination of thinking and practical skills accompanied by knowledge and comprehension of asset-related activities. Competence should be treated firstly as an official authority (by position) and secondly as a personal authority that an individual maintains at a particular point in time. The competence may be ‘professional’ meaning it is related to a specific profession (i.e. marine engineer or naval architect) or ‘managerial’ in that it relates to managerial processes and relations. Professions have been characterised by the following qualities: specialist knowledge; required credentials for inclusion; regulated activities; and a common set of values binding the group together (Susskind and Susskind 2015). A program that professionalises asset management specialists has been cited as a critical success factor to asset management implementation in Defence (DSTG 2015).

3 Professionalisation

Professionals are often described as persons with degrees of specialisation in discrete fields that relate to the development of new knowledge or skills (Lilleker and Negrine 2009). Professionalisation refers to a social process an occupational group takes regarding one or more elements of an ideal type of profession (Vollmer and Mills 1965). Professionalisation has five constituent components: the work is performed full-time and the job is considered permanent; an organisation encourages established training through a scheme, regimen or formal schooling; a professional association forms around the occupation; the job title is protected by law; and there is a formal and established code of ethics (Wilensky 1964). Through an appropriate mix of education, experience and recognised qualifications, ALCMs can attain a recognised pedigree through a formal certification process that acknowledges competence and professionalises the ALCM role in CASG's SMPCF.

3.1 Education

ALCMs should have nationally recognised engineering degrees. Education and academic accomplishment hold a prevailing power in professionalisation in technical disciplines. University level education provides a level of assurance of minimum engineering competency, both theoretical and practical. An engineering undergraduate degree provides the basis for not only sound engineering practice but also meets requirements necessary for recognition by professional engineering bodies and associations like Engineers Australia (EA) or the Institute of Marine Engineering, Science and Technology (IMarEST). In many countries, post graduate training is a very efficient way of improving the qualifications of maritime professionals because it helps introduce them to the latest advances and developments in the maritime sector. Formal education should also include targeted short courses that specialise in specific business, technical or maritime capability aspects that support the ALCM job description. Several Australian universities offer advanced courses in sustainment and engineering asset management, which would also support attaining or maintaining competency. Industrial management training following undergraduate coursework should not be discounted; it can be a viable option for providing valuable training for maritime specialists outside of the university setting. Non-resident business-related short courses are readily available from Australia Institute of Business (AIB) or Australia Institute of Project Management (AIPM). Basic courses in asset management and ISO 55001 are available from registered training organisations. (These competency-based training courses are currently listed within the SMPCF and provide a basic approach to asset management but are wholly inadequate for ALCMs.) Commercial training providers like Life Cycle Institute partner with universities to offer a complete range of courses covering different aspects of life cycle management. Courses directly related to submarine engineering and design, warship capability management and FLCM are

also available from commercial vendors within Australia. Special courses developed specifically for ALCMs can provide focussed attention to better meet naval enterprise needs.

3.2 Experience

Experience should be measured qualitatively and quantitatively. Qualitative experience can be measured by years of working in related fields and other types of jobs performed while serving in specific maritime asset management roles. Involvement in Australian naval operations as a member of a ship's company can provide valuable experience for an ALCM. Seagoing experience in allied navies provides an appropriate level of naval operations knowledge with ties close enough to the RAN that would be sufficient. Past work in seagoing maritime operations, either commercial shipping or deep-water drilling would also provide a substantial level of applicable maritime experience directly relatable to the ALCM position. Less applicable, but still noteworthy, would be life cycle engineering and management experience in commercial port/marine operations or land-based asset intensive fleet industrial operations in rail & transport, infrastructure, utilities or commercial aircraft sectors. Past experience serving as either a Chief Engineer, Port Engineer or Ship Manager in the commercial shipping industry would be invaluable and heavily desired in ALCMs. Qualitatively, this would provide a certain level of assurance that an ALCM has the relevant experience and expertise to competently perform the assigned duties. Quantitatively, experience can be measured by the number of years an individual has served in previous roles or by the number of maintenance periods that have been managed and the total maintenance and operations budgets for those specific vessels as well as the size and complexity of vessels managed. Previous work with commercial contract management could provide the appropriate business-related experience ALCMs need.

3.3 Third Party Recognition

Third party credentials provide supporting objective evidence of competence and compliance against established, recognised and accepted standards. Achieving and maintaining recognition from established authorities outside of Defence lends greater credence to claims of education, experience and expertise in areas specifically identified as critical to ALCMs' roles and responsibilities. Modern credentialing contributes to legitimatising professionalised occupational groups based on the possession and application of unique technical qualifications, knowledge and skills that are crucial and indispensable to highly skilled professions. Formal credentials, such as licences, can be used as a method to certify mastery in a specific body of knowledge. Credentials that address business, technical and maritime/naval operations are needed to support the tremendous tasks that have been outlined in the ALCM competency model. Such credentials can be attained through various Australian organisations.

ALCMs are expected to be highly experienced and thus should have an AMSA issued Engineer Class 1 licence to validate a person's competence in structural, mechanical and electrical shipboard systems. A qualification in marine surveying signifies a person's competence in understanding and applying established standards to determine a vessels' compliance. Each ALCM should be a Chartered Professional Engineer (CPEng) with EA. Formal credentialing from AIPM signifies experience, knowledge and competence in high risk, high profile and challenging projects. Formal certification in asset management from Australia's Asset Management Council is recognised nationally and internationally and attests to an individual's knowledge and skills and demonstrates a person's ability to improve asset performance through application of asset management methods, practices and principles. Certificates of competency in either Marine Engineering or Weapons Electrical Engineering attained through active service in the RAN would be highly desirable for an ALCM. Formal recognition in engineering, business, project management and specific maritime industry activities will be necessary for the ALCM cadre to be established as a recognised authority in life cycle management of naval ships.

3.4 Formal Qualification and Recognition by Defence

The USN PEP has four levels of certification. Each stage of certification requires candidates to satisfactorily complete a demanding program that includes formal course work, self-study, practical demonstration of activities and successfully passing standardised written examinations (USN 2014). A similarly tiered qualification program could easily be developed for ALCMs. ISO 55001 requires an organisation to ensure asset management professionals "are competent on the basis of appropriate education, training, or experience" (SA 2014). Defence policy requires formal asset management certification for all sustainment management roles. Certification should be based on an assessment against known competencies in sustainment and from AQF accredited Asset Management competencies (DMO 2014). The ALCM qualification must go beyond this and should be developed to cover all competency model elements while also providing rigour to withstand scrutiny by naval enterprise stakeholders. Establishing an ALCM Qualification Program inside Defence will provide an objective qualification that is specific to asset management for naval vessels and will also provide a career path for the cadre of ALCMs.

4 Conclusion

ALCMs require education and experience, credentials recognised by professional entities and organisations (outside of Defence) to provide an objective assessment of knowledge, skills and abilities. Managing ALCM competencies through a formal program provides assurance that assigned ALCMs not only understand their role but that they have the fundamental elements required to perform life

cycle management duties and responsibilities for the assigned ship. They should also have formal qualifications specific to the ALCM role inside of Defence. ALCMs can be professionalised through establishing a formal program that encompasses education, experience, third-party credentialing and formal qualifications recognised and acknowledged by Defence as required for the ALCM role. Using the USN PEP as a model, Australia's naval enterprise can easily develop and implement its own professionalisation regime to produce elite professional life cycle managers for some of the most complex naval assets in the world.

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