**PART 1: APPLICANT CAREER HISTORY**

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| **APPLICANT DATA****Please enter your name below:** |
| **Given Name(s)** | **Family Name** | **INCOSE Membership Number** |
| Stella | Appley-Cant | 99999 |

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| **EDUCATION AND AWARD HISTORY****Please enter your relevant degrees, certifications, and awards below:** |
| **Degrees (Type and Field; University)** | **Certificates and Certifications** | **Awards** |
| BSc Biological and Ethical Systems (1st Class Hons); University of South Mimms |  | Clearway Young Engineer of the Year 2005  |

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| **CAREER HISTORY****Please list your career history with your CURRENT POSITION as Ref 1** |
| **REF** | **Dates** **From – To** | **Job Title plus Employer Name** | **Role/Key Responsibilities (summary only)** |
|  | 10/2015-date | Principal Systems EngineerM1 Traffic Management Corp. | Systems engineer and specifier (formal methods) for highway traffic control management system and service:* Requirements engineering and architectural design for conversion of an operational existing management system into a platform-independent service, operating on a generic platform and with a new HMI,

Requirements engineering, architectural design, formal specification and impact analysis for changes to an operational tactical separation management system |
|  | 3/2014-10/2015 | Operational risk analystBioEthics PLC | Operational risk analyst, for BioEthics company IT department* Adapting our internal method to suit the customer’s needs and constraints
* Training a small team of IT and finance experts in our method

Performing and reporting the analysis with the team, ensuring effective use of the adapted method. |
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 | 5/2012-10/2014 | Senior Test EngineerChoo2 Rail | Verification specialist, working on railroad systems* Writing a generic, tailorable verification strategy and process for a rail system
* Writing the verification strategy and process for a rail project generating prototype software

Assessing an rail project experiencing verification challenges in certified software to a tight schedule: recommend strategic changes and implementing them to enable delivery of certification evidence to an agreed schedule |
|  | 4/2009-5/2012 | Development EngineerClearway Systems | Verification engineer, requirements engineer developing and maintaining a highway traffic control management system.* Writing the project verification strategy, processes, templates and standards to deliver safety verification evidence, with a team of company engineers and contractors across multiple sites.
* Formally specifying aspects of the system (HMI and parts of the engine), using formal method (Z) and UML, and providing impact analysis for changes.

Eliciting system requirements from stakeholder workshops. |
|  | 4/2007-4/2009 | Development EngineerClearway Systems | Trainer in safety for various Highway Management System projects.* Fault tree analysis for communications (developing and reviewing fault trees, presenting to the customer).
* Hazard analysis through workshops.
* eSafety Case and hazard log database developer and maintainer for critical infrastructure information system.

Delivering formal training in requirements engineering for operational risk management. |
|  | 10/2001-4/2007 | Development EngineerClearway Systems | Requirements engineer, trainer and verification engineer for various highway traffic management projects:* Tool developer and coach for railroad rolling stock manufacturer.
* Verifier for traffic information system updates, deriving verification conditions and test from Z specification.

Requirement maintainer/ database maintainer and tool support |
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**PART 2: COMPETENCE STATEMENT**

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| **APPLICANT COMPETENCE STATEMENT****Please indicate your competence area selections and supply written competence evidence in the spaces provided below for all seven competency groups SE-1 to SE-7.****Evidence should cover NINE competency areas in total.** |

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| **SE-1 SYSTEMS THINKING****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of fundamental concepts of systems thinking to systems engineering in at least TWO of the following, at Practitioner level or above, as defined in [REF 1]:** 1. **SE1A – Systems Concepts: Understanding what the system is, its context within its environment, its boundaries and interfaces and that it has a lifecycle**
2. **SE1B - Super System Capability Issues: Appreciating the role that the system plays in the super system of which it is a part**
3. **SE1C – Enterprise and Technology Environment: Defining, developing and producing a system within an enterprise and technological environment.**

**NOTE: Applicants are required to indicate the two SE-1 competence areas they wish to be assessed in the boxes immediately below. Note other competencies will NOT be assessed.** |
| **SE-1 Selected Competence Area 1:** | **Systems Concepts** |
| **Name of Reference(s) validating your experience for SE-1 Competence Area 1:** | R1 |
| **SE-1 Selected Competence Area 2:** | **Super systems capability issues** |
| **Name of Reference(s) validating your experience for SE-1 Competence Area 2:** | R1 |
| **APPLICANT EVIDENCE FOR SE-1 (Competence Areas 1 and 2)****Systems concepts*****Able to identify and manage complexity with appropriate techniques in order to reduce risk**** P1, I managed complexity in a number of ways:
	+ Prioritising SE tasks to manage complexity and risk,
	+ Assessing comparative complexity and associated risk in alternative solutions, identifying where this could be reduced, or could introduce issues
	+ Selecting solutions that embody design principles to manage the complexity (e.g. low coupling, high cohesiveness, data exchange using highways agency traffic control concepts and maintaining clear lines of responsibility).
	+ Using scenarios, UML entity relationship diagrams, state transition diagrams and sequence diagrams to identify interactions, contention and races between systems,
	+ Defining the selected solution in decomposition from user requirements to tactical separation service requirements and dependencies on consumed and consuming services to clearly define functionality and communicate the impact on each technology.
	+ Using review workshops and walkthroughs to communicate the advantages and risks of the solution to stakeholders; highways agency traffic control, human factors, safety, security, IV&V and service suppliers.
	+ Reviewing proposed consumed interface designs (.XSDs) and identifying where the proposal introduces complexity, and how it can be reduced.
* P4, I produced and maintained formal specifications, using UML (Entity Relationship Diagrams, State Transition Diagrams, Use Cases and Sequence diagrams), Use of the formal language Z, ICDs, and sequence diagrams. These techniques were effective in abstracting from the implementation design to maintain requirements and specifications that do not over constrain the solution.

***Able to predict resultant system behavior**** P1, I identified requirements on the vehicle separation management service and dependencies on consumed services and configuration, showing how these could be combined to deliver the required behaviour. I use sequence diagrams and scenarios to analyse and show the effect of the combined systems on the behaviour observable to the user. I introduced and implemented a systematic method for considering and predicting system behaviour in failure conditions, and reviewed XSDs, change definitions, and proposals, and identified how qualities of the proposals and XSDs would impact system behaviour.
* P2, I produced risk analyses for the IT department for a Biological Ethics company and analysed cross-system risk, to estimate likelihood and impact, predicting behaviour across the department.

***Able to define system boundaries and interfaces**** P1, working with the architects I established an understanding within the project of supported interfaces (data flows), and which organisation bears responsibility for each interface. Following selection of preferred solutions, I identified the functional apportionment and data flow requirements on each interface, leading to ICD definition, and then generated XSDs for consumed configuration data, updated XSDs for the vehicular separation management service, and reviewed XSDs for associated consumed services.
* P4: I maintained abstract ICDs for the vehicular separation management system.

***Able to assess the interaction between humans and systems, systems and systems**** P1, my work involved analysis of interactions between the services and analysis of alternative solutions to identify potential human factors issues. This culminated in a managed list of dependencies on the consumed services, and a hierarchy tracing from user requirements to service and technology requirements and dependencies on consumed and consuming services. This resulted in architectural design that limited:
	+ coupling between the services,
	+ sensitivity of the vehicle separation management service to platform variations, and
	+ human factor issues requiring special management.
* P2, I generated risk analyses that considered the interaction between systems within the IT department, as well as risks within each separate system. This involved considering common cause failures, common themes and combinations of failures.
* P5: I analysed the likelihood of failure due to the interaction of systems.

***Able to guide a supervised practitioner**** P1, introducing SE concepts (decomposition, hazard analysis, some agile SE concepts) and providing guidance to junior systems engineers.
* P2, providing formal training and coaching in the operational risk management method.
* P5, P4 providing formal training in formal methods (Z) and requirements engineering
* P6, I was part of a team providing coaching and formal training in requirements engineering, in a capability enhancement project for a rail rolling stock company, focusing on enabling abstraction.

**Super system capabilities issues*****Able to identify the super System Capability Issues which will affect the design of a system and translates these into system requirements**** P1, identifying how vehicle traffic control method of operations, congestion planning operations, and future autonomous vehicle management operations affect the design of the vehicular separation management system. For example:
	+ Legal use of Vehicle ANPR Recognition as defined within European directives and how this impacts operation, e.g. transfer or access to authorised personal data access and control
	+ Route planning; additional functional requirements to support highway traffic control to compensate for limitations in external systems and external elements such as meteorological obstacles
	+ Limitations in correlation between different administrative areas, leading to requirements to manually analyze vehicular traffic situations
	+ Decomposition of non-functional performance and reliability requirements
* Preparation of successful example sales material, illustrating proposed method of decomposing requirements on a Highways Agency traffic management super system to limit environmental pollution (e.g. noise).

***Able to assess extent to which the proposed system solution meets the super system capability, and provide advice on trade-offs**** P2, identifying operational risk across systems within the IT department of a Biological Ethics company and how those combine to create operational risk of unwanted emergent super system behaviour, how single failures can manifest across the systems and common themes across different systems. Recommending on the basis of the analysis:
	+ Key risk indicators
	+ Mitigation and containment strategies
	+ Changes to reduce likelihood (e.g. greater separation of operational environments)
* P5, safety analysis of capabilities delivered by combined systems: future inter-vehicle comms and Highways Agency future management protocol
	+ Assessment of risk through fault tree analysis, and recommendations to reduce likelihood by introducing redundancy
	+ Assessment of hazards across systems with recommendations to investigate consistency of treatment of sensor accuracy over time

***Able to guide supervised practitioner**** P1, supervision of junior systems engineers and introduction of highway control concepts and the impact of related systems and highway agency operational concepts
* P1, preparation and roll out of SE approach to identify highways agency control requirements on the combined service, then apportioning and decomposing this to requirements on the vehicular separation management service and dependencies on consumed service, and decomposing this to technology level requirements.
* P3 I have prepared sales material (case-study) illustrating decomposition of environmental pollution and noise requirements across rail systems which was later used as an example for the project team.
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| **SE-2 DETERMINING AND MANAGING REQUIREMENTS****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the analysis of stakeholder needs and expectations in order to establish and manage the requirements for a system at Practitioner level or above, as defined in [REF 1]** |
| **Name of Reference(s) validating your experience for SE-2:** | R1 |
| **APPLICANT EVIDENCE FOR SE-2*****Has successfully elicited and validated stakeholder requirements**** P1, my chief objective in this project is to elicit user requirements and decompose these to service and technology level requirements. I do this through workshops with Customer traffic control staff, architects and other stakeholders, and validate them through review and use cases. I identify and escalate platform validation issues outside of the scope of highways traffic management.

***Has written good quality, consistent requirements**** P1, I have written user and service level requirements and reviewed with them with the Highways Agency, customer architects and engineers, human factors, safety, security, V&V, and suppliers, adjusting them to suit the stakeholder language and understanding. I wrote example requirements and decomposition to introduce the approach to the team, and my work has since been used as an example.

***Able to derive requirements from analysis of the super system design**** P1, working ahead of the platform (super system) requirements, I worked with Highways Agency to understand the platform requirement, architects to understand the platform level architecture and with suppliers to understand the consumed services, from this I derived service and technology level requirements for the traffic management system. As the platform requirements is now maturing, I am tracing this further to platform level requirements, and identifying and addressing gaps.

Prior to this, working on the original technology, I assessed problem reports, worked with the Highways Agency to understand the issue and then with other engineers to understand contributing systems, before preparing alternative solutions for consideration.* P4, working from feeder papers generated by the customer and the Highways Agency, I generated system level requirements, and the formal requirements specification.

***Able to establish acceptance criteria for requirements for the system of interest**** P4, I was responsible for generating verification criteria from a formal (Z) specification, which served both as criteria for verification and contributed to the formal system acceptance test. As part of this project I also worked with the customer’s validation team to compare V & V criteria and provide recommendations on coverage.
* P3, I was responsible for defining acceptance and verification criteria against natural language requirements. The criteria were validated by tests executed an operationally representative environment.

***Able to resolve and negotiate requirement conflicts in order to establish a complete and consistent requirement set for the system of interest**** P1, this project brings together suppliers and systems with divergent principles and conflicting interests, as well as different groups of users with sometimes conflicting requirements. Reaching a preferred solution with backing from all groups has involved, drawing out the essential conflict, finding compromises and imaginative alternatives, and communicating with care the properties of alternative solutions. In each of the areas that were my responsibility, I have been able to reach a complete and consistent solution and document this in terms of the resulting system behaviour, service level requirements and dependencies on the consumed services and constraints on the consuming service.

***Identifies areas of uncertainty and risk when determining requirements**** P1, I have identified areas of uncertainty and risk when comparing alternative options, and when reviewing work package descriptions and specifications. Risk was not always communicated within the requirement, because the requirements formed a contractual boundary for the project, and the addition of risk would have made the contractual meaning of the requirement unclear.

***Able to challenge appropriateness of requirements in a rational way**** P1: I reviewed and responded to requirements generated by other members of the team and importantly by suppliers. I often challenged them, suggesting alternatives when they were ambiguous, unverifiable, unnecessary or had the potential to cause downstream integration or validation issues.
* P3: I reviewed requirements with a view to verification suggesting changes where necessary.
* General: I am responsible for training new starters in solution review, this covers many areas, including ensuring that they challenge (rationally) when they see issues.

***Able to define and document an approach for requirements elicitation and management**** General: I have been delivering requirements engineering training and informal coaching to new starters since P7, covering all aspects of requirements elicitation and management. I also developed example processes in support of sales, and SE work on P1.

***Can assess the impact of changes to requirements on the solution and programme**** P1, P4, I provided impact assessments for changes in requirements. This included using metric models, but also understanding and challenging the wider implications of changes (eg. .if the change introduces potentially unsafe behaviour or unexpected complexity).

***Able to guide supervised practitioner***General: I have been delivering requirements engineering training and informal coaching to new starters since P7, covering all aspects of requirements elicitation and management. |

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| **SE-3 HOLISTIC LIFECYCLE VIEW****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of at least TWO of the following at Practitioner level or above, as defined in [REF 1]****NOTE: The two areas selected for SE-3 CANNOT be the same as those selected for SE-4 to SE-7**1. **SE3A - Architectural Design**
2. **SE3B - Concept Generation**
3. **SE3C - Design for …**
4. **SE3D- Functional Analysis**
5. **SE3E -Interface Management**
6. **SE3F -Maintaining Design Integrity**
7. **SE3G -Modelling and Simulation**
8. **SE3H -Select Preferred Solution**
9. **SE3I -System Robustness**
10. **SE3J -Systems Integration and Verification**
11. **SE3K -Validation**
12. **SE3L -Transition to Operation**
13. **SE3M -Concurrent Engineering**
14. **SE3N-Enterprise Integration**
15. **SE3O -Integration of Specialisms**
16. **SE3P -Lifecycle Process Definition**
17. **SE3Q -Planning, Monitoring and Controlling**

**NOTE: Applicants are required to indicate the two SE-3 competence areas they wish to be assessed in the boxes immediately below. Note other competencies will NOT be assessed.** |
| **SE-3 Selected Competence - Area 1:** | **Select Preferred Solution** |
| **Name of Reference(s) validating your experience for SE-3 Competence Area 1:** | R2 |
| **SE-3 Selected Competence - Area 2:** | **Systems Integration and Verification** |
| **Name of Reference(s) validating your experience for SE-3 Competence Area 2:** | R1 |
| **APPLICANT EVIDENCE FOR SE-3 (Competence areas 1 and 2)****Select Preferred Solution*****Able to define selection criteria, weightings of the criteria and assess potential solutions against selection criteria**** P1, P3 using an established decision management process and selection matrix I have assessed verification strategies and requirement management tools to select a preferred option, formally identifying and weighting criteria, and using quantifiable criteria. A significant part of my role on P1 was in generating and comparing alternatives, assessing the impact on each supplier, schedule, budget, human factors, safety, security and the architecture and design principles.
* General: I have also been defining a new agile approach to SE. As a result, I found this style of pragmatic decision making essential to selecting and prioritising SE tasks.

***Able to choose the appropriate tools and techniques for selecting the preferred solution, e.g. trade analysis, make/buy analysis**** P1, P4, I documented key selection-drivers, comparing all options against these as well as the overarching project design goals, using enough formality and quantification to enable a balanced decision to be made. In these projects I intentionally avoided a fully quantified approach in order to manage the schedule and budget cost to decision making, where selection based on the key-drivers did not necessitate quantification.
* In other cases (comparison of verification strategies, and adoption of a novel approach) I used a formally defined approach and quantified the criteria.

***Able to perform trade analysis and justify the result chosen in terms that can be quantified and qualified**** P1, created some difficult decisions. In these cases, I assessed the impact of alternatives on each service, deciding to proactively approach suppliers for impact assessments and safety for risk analysis to support the eventual decision.

***Able to negotiate trades**** P1, there was a high potential for conflict on this project, and to ensure success I had to negotiate agreements to several conflicts. To do this I tried to understand the essential conflict and to look at potential compromises and alternatives, always considering imaginative solutions and trading compromise if the impact seemed acceptable.

***Able to guide supervised practitioner**** P1, I designed a common approach to selecting options. This is now used across the team to deliver a consistent and systematic approach to documenting different project options, their preferred solution and supporting rationale. This makes the information about considered options easier to extract and critique across different areas.
* During this project I supervised two junior systems engineers, both adopted the ideas and approach and used it independently later without additional support.

**Systems Integration and Verification*****Able to trace verification requirements back to system requirements and vice versa**** P4, P3, P6, I’ve worked as a verification designer (responsible for deriving verification conditions/ requirements and tests, from system specifications and requirements, and maintaining the tracing), and in later projects, as verification architect, designing verification strategies that deliver Requirements Verification Traceability Matrices dependent on maintaining this tracing. I am able to implement, use and review tracing from verification requirements to system requirements (in both directions) and I understand the importance of this to:
	+ Controlling the scope of verification
	+ Demonstrating completeness
	+ Understanding and managing the impact of change
	+ Understanding and monitoring progress

***Able to write an Integration and Verification plan for a complex system, including identification of method and timing for each activity* and *Able to write detailed integration and verification procedures**** P3, P4: In these projects my role was verification architect and involved writing the verification plan (strategy, process, standards), which covered both the definition scope and approach, and the methods used. The role also involved technical planning and input to the schedule and optimising the strategy and plan to deliver the required level of certification evidence within the program schedule and budget. My performance in P4 lead to my role analysing and addressing strategic verification problems in P3, which I managed to do, while improving the confidence of the customer engineering manager in verification.
* P2: I wrote a CMMI 3 verification strategy, process and templates for our overall organization.

***Can demonstrate effective management of systems integration and verification activities**** P4, P3, As lead verification engineer (also responsible for technical strategy and quality), I worked with the test manager (primarily responsible for budget and schedule) to provide effective management. On the technical side, this included ensuring that the strategy and tools enabled us to:
	+ deliver certification evidence to a predictable schedule and budget,
	+ show measurable and predictable progress/ work to do
	+ measure earned value,
	+ structure the team to effectively delegate and develop engineers,
	+ handle changes and risks with a predictable and minimised impact.

***Able to diagnose complex faults, document, communicate and follow up corrective actions**** P6, P4, P3: all of these projects involved me responding to test anomalies, identifying whether they are faults in the system unit test or in test and performing fault analysis to determine the cause and ensure that the fault is repeatable. In early projects (P7 and the earlier stages of P5), this was part of my day-to-day job, in P4 and the later stages of P5 I was responsible for other engineers doing this, ensuring they able to perform fault analysis, and only involved in analysis of the more complex faults and specification issues, prioritising issues and presenting high profile issues to project management and the customer.
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| **SE-4 SYSTEMS ANALYSIS AND DESIGN****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of ONE of the following FOUR areas at Supervised Practitioner level or above, as defined in [REF 1]:** **SE4A - Architectural Design****SE4B - Concept Generation****SE4C - Design for …****SE4D - Functional Analysis****NOTE: Applicants are required to indicate the SE-4 competence area they wish to be assessed in the box immediately below. Note other competencies will NOT be assessed.****The area selected is required to be different from those addressed in SE-3 above.** |
| **SE-4 Selected Competence Area:** | **Functional analysis** |
| **Name of Reference(s) validating your experience for SE-4:** | R1, R2, R3 |
| **APPLICANT EVIDENCE FOR SE-4****Functional analysis*****Able to use appropriate tools and techniques to conduct Functional Analysis**** P5, this project involved Fault Tree Analysis of a number of functional failures relating to incorrect/loss of various data classes from a Highway Traffic Management System. The work required data flow analysis to enable the construction of the fault tree.
* P3, P4, involved functional analysis in order to effectively verify aspects of the prediction algorithms, and timing –dependent functionality; decomposing the functionality into subsystems and basic functions in order to build verification evidence from code review, static analysis and unit testing. The primary and default source of verification evidence was from black-box system testing (the software was always statically verified), but in areas where it was difficult access a function, we analysed the design, decomposing to functions to gain verification evidence. I also used data flow analysis to build a non-corruption argument to support safety certification.
* P6, involved data flow analysis of delivered Automation tool (ReQTest, Jama) adaptations, to ensure quality control and address issues.

***Has contributed to Functional Analysis activities**** P1, P4, I used context diagrams, data flow analysis, N-squared matrices (informally) and the system/ service level to assess the suitability of options, and illustrate issues (especially with race conditions, failure recovery and efficiency of data exchange).
* P4, I was a formal specifier, responsible for writing formal detailed specifications in the “Z” language as well as ICDs and system state models. I generated low level but black box specifications that formally define a static state model and operations but does not specify the design (code modules and units). Definitions of system state and operations trace provided a functional and logic decomposition of the system, and trace to the requirements.
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| **SE-5 SYSTEMS ENGINEERING KEY SUPPORTING COMPETENCIES****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of ONE of the following FIVE areas at Supervised Practitioner level or above, as defined in [REF 1]:** **SE5A - Interface Management****SE5B - Maintaining Design Integrity****SE5C - Modelling and Simulation****SE5D - Select Preferred Solution****SE5E - System Robustness****NOTE: Applicants are required to indicate the SE-5 competence area they wish to be assessed in the box immediately below. Note other competencies will NOT be assessed.****The area selected is required to be different from those addressed in SE-3 above.** |
| **SE-5 Selected Competence Area:** | **Interface management** |
| **Name of Reference(s) validating your experience for SE-5:** | R1 |
| **APPLICANT EVIDENCE FOR SE-5****Interface management*****Able to follow interface management procedures**** P1, P4, defined and maintained interface definition documents in line with the project standards and management procedures. Reviewed interfaces against project standards.
* Identified design principles that influence interfaces and generated concrete interface definitions (.XML and .XSD) in compliance with these, and identified issues with consumed interfaces that conflict with the principles. These included
	+ use of generic interfaces that are very permissive but (in a safety related system) demand the consuming service to define a response to unsupported input.
	+ code or model generated of interfaces for a service that has many consumers; the interface updates come late in the schedule and a change has potential for unexpected impact, and impact on otherwise unaffected consumers
* I also identified issues with the organizations approach to interface management on the consumed service interfaces, describing problems that the approach will cause the customer and other suppliers.

***Able to identify and define simple interfaces**** P1, defined configuration interfaces. Reviewed the service definitions and the design of interfaces for consumed services.
* P4, maintained abstract and concrete ICDs
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| **SE-6 SYSTEMS BUILDING****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of ONE of the following THREE areas at Supervised Practitioner level or above, as defined in [REF 1]:** **SE6A - Systems Integration and Verification****SE6B - Validation****SE6C - Transition to Operation****NOTE: Applicants are required to indicate the SE-6 competence area they wish to be assessed in the box immediately below. Note other competencies will NOT be assessed.****The area selected is required to be different from those addressed in SE-3 above.** |
| **SE-6 Selected Competence Area:** | **Validation** |
| **Name of Reference(s) validating your experience for SE-6:** | R2 |
| **APPLICANT EVIDENCE FOR SE-6****Validation*****Able to conduct system validation activities according to the plans**** P6, my V&V role during this project involved performing validation tests and demonstrations to the system users of the ship helicopter landing information system
* P1, P4, my role in these projects involves early validation activities, validating requirements and predicted system behaviour highway controllers, and in P4 working with highway controllers to assess observed system behaviour against their operational need
* P4, P3, P6; in each of these projects we used a strategy (suited to a project that achieves some verification through MBSE tool-driven static analysis) that placed then onus on black box, system level verification which, performed in an operationally realistic environment also delivers validation. In P5, this also involved collaboration with the customer validation team to provide consultancy.
* General: as SE and verification architect I have been involved in maintaining quality controls and validating requirements and specifications through review and use-case modelling.

***Able to collate validation results**** P4, P3, P6, my role in each of these projects involved collating, reviewing and presenting the requirements database as validation evidence, and presenting this to the customer, and in some cases the customer’s customer.
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| **SE-7 SYSTEMS ENGINEERING MANAGEMENT AND CONTROL****Use a combination of general and specialist Systems Engineering knowledge, experience, skills and understanding in the application of ONE of the following FIVE areas at Supervised Practitioner level or above, as defined in [REF 1]:** **SE7A - Concurrent Engineering****SE7B - Enterprise Integration****SE7C - Integration of Specialisms****SE7D - Lifecycle Process Definition****SE7E - Planning, Monitoring and Controlling****NOTE: Applicants are required to indicate the SE-7 competence area they wish to be assessed in the box immediately below. Note other competencies will NOT be assessed.****The area selected is required to be different from those addressed in SE-3 above.** |
| **SE-7 Selected Competence Area:** | **Planning, monitoring and controlling** |
| **Name of Reference(s) validating your experience for SE-7:** | R2 |
| **APPLICANT EVIDENCE FOR SE-7*****Understands the role of systems engineering planning as part of an overall project/programme plan**** P1, P4, P3: I planned SE and Verification tasks (in both cases with a project manager):
	+ planning SE tasks allowing for uncertainties and significant stakeholder involvement,
	+ prioritising SE tasks to support downstream work and address difficult and foundation areas early,
	+ differentiating between high and low-value SE tasks at each point in the project lifecycle; for example, identifying SE tasks that impact a number of suppliers and will be costly or difficult to correct later as high-value early in the project,
	+ managing issues created by service level SE working in parallel with implementation and verification, and ahead of platform requirements,
	+ evaluating the impact of SE and architectural decisions on verification and implementation, either qualitatively or quantitatively using metric models based on specification estimates,
	+ identifying dependencies on key resources and where there is a need for investigations or trade studies that will take time.

***Able to monitor progress against the systems engineering plan**** P1, P4, both entailed progressing and reporting my progress against a plan that I agreed with the project manager, identifying risks and uncertainty, and opportunities.

***Able to assist in the management of systems engineering risks**** P1, P4, P3: identifying and managing risks inherent in preferred solution, addressing the risk inherent in working service requirements ahead of safety, security and platform functional and non-functional requirements
* P2: I performed a formal operational risk analysis within an IT department, providing recommendations on how to manage those risks, including key risk indicators, mitigations, containment strategies.

***Able to assist in the management of systems engineering changes**** P1, P4: the early stages of P1 and late stages of P5 I was responsible for defining and specifying changes to the highway traffic management system. This involved understanding the source of issues working with diverse users, evaluating alternatives, selecting a preferred solution, identifying the impact of this on each system, providing a quantified impact assessment and specifying the change.

I proactively identified opportunities to make required or expected changes more manageable, escalated where the impact was greater than expected and consulted with implementation and verification to understand how to specify the change in a way that minimised impact.* P3: Although I was responsible for verification for this project, one of the sources of difficulty for verification was the project’s baseline management approach. I recommended changes to the way SE changes were handled (using requirement level version control and allowing changes to be fed slowly into verification rather released only in baselines, this change ensured:
	+ accurate reporting of work-to-go in verification
	+ reduction in nugatory work caused from verifying against out of date baselines
	+ increased value of verification, ensuring all activities contributed to eventual system certification
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**PART 3: APPLICANT AFFIDAVIT**

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| **Affidavit by Applicant**I, the undersigned, have read the contents and information hereof, and to the best of my knowledge and belief the statements contained in this application are true in substance and effect and are made in good faith. I further state that I have read the INCOSE Code of Ethics and pledge to adhere to it. I further understand that my name (with organization/division, city, state, and country) will be posted on the INCOSE public web site and may be otherwise communicated by INCOSE if I am recognized as a Systems Engineering Professional. I understand that I have an ongoing obligation to keep my information current with INCOSE. I further understand that my experience will be considered only through the date of this application, noted below. I understand that I have one calendar year from the application date to complete all of the activities associated with the application. INCOSE’s use of my personal data is described in the [Privacy Policy](https://www.incose.org/privacy-notice) and [Terms of Use](https://www.incose.org/terms-of-use).  |
| Accept Affidavit: Yes [x]  No [ ]  |
| **Applicant’s Signature:** ***(Typed Name Is Accepted as Signature for electronic applications)*** | Stella Appley-Cant |
| **Date:**  | *2020-09-01* |