Competency Seminar

Competency Pathways – Control Systems Standard Launch

Masonic Centre, Sydney
Welcome

Jennifer Duxbury
Industry Engagement Coordinator
IF YOU HEAR THE FOLLOWING ALARMS:

**ALERT ALARM**
Action: All wardens to respond. Staff to check immediate area for signs of danger and stand by. (Outside normal working hours immediately evacuate on sounding of the Alert Alarm)

**EVACUATION ALARM**
Action: All staff evacuate via the nearest exit and proceed to the assembly area.

KNOW YOUR EXITS

FOR YOUR SAFETY MAKE SURE YOU KNOW THE LOCATION OF THE NEAREST EMERGENCY EXIT
Asset Standards Authority
Progressing across all modes

Jim Modrouvanos, Executive Director
TfNSW update
Our challenges ahead

- Governance across transport modes
- Defining ASA’s technical role across all transport modes
Setting The Scene – The Competency Imperative……

Mark Smith
Principal Manager Industry & Technical Development
Agenda

• **Background**
  - Mark Smith, Principal Manager, Industry & Technical Development
  - Steve Lemon, Signalling & Control Systems Manager
  - Fiona Love, Principal Manager, Capability Services, Organisational Development

• **Launch**
  - Omer Saricilar, Principal Engineer, Control Systems
  - Jocelyn Edwards, Manager Competency Systems

• **Demonstration**
  - Jocelyn Edwards, Manager Competency Systems

• **Wrap up**
  - Mark Smith, Principal Manager Industry & Technical Development
Purpose of Seminar

We recognise competency is a popular subject...

*Above all else* - *we want to hear from you regarding competency, our approach and our documentation.*

**Key Objectives**

- To focus on the AEO population
- To reframe the strategic imperative to broaden the competitive supply chain for the provision of critical services
- To articulate the TfNSW position & intent
- To clarify the role of TfNSW and TfNSW engaged entities
- To launch the *Competency Pathways – Control Systems* Standard (T MU CY 04000 ST) & guide
- To test elements of the standard in a workshop environment & feedback accordingly
- Start to establish a common language
The Assurance Game - Many pieces to build….
AEO Capability Profile

Maturity ratings summary

Documented Average Deployed Average Combined Average Highest average
TfNSW competence, compliance and accreditation framework

Drivers
- National Laws
- Regulators
- NSW Laws

Standards
- TfNSW Competency Requirements (Generic)
- TfNSW Technical Standards

Domain & Product Knowledge

Framework
- AEO Specific Requirements
- Network Specific Requirements (Domain & Product)

AEO Competency Management System
- Competency Assessment decision made and evidenced

Licensing
- Network Specific Licensing and Accreditation

August 2015
TfNSW Collaborative Competency Delivery Model – Who Does What?

TfNSW Asset Standards Authority

Sets the **Generic competency requirements** for specific (critical) functions & publish on behalf of TfNSW for the AEO population

O&骧 Agencies  
(e.g. Sydney Trains)

Provides the **Product and Domain competency requirements & information**

TfNSW Organisational Development

Supports the provision of education, competency and training products and services to enable industry to meet the competency requirements
Stephen Lemon
Signalling & Control Systems Manager
Sydney Trains
Collaborative Competency Delivery Model

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August 2015
The Operator / Maintainer Perspective

The importance of rigour of assessment.

• Sydney Trains need AEOs to be able to demonstrate they have assured themselves that competent people will deliver the work in control systems

• The network is complex and the consequences are high risk
The Operator / Maintainer Perspective

Road to authorisation

• Sydney Trains are working with ASA & OD to determine the gaps in domain & product knowledge.

• Authorisation to work on the network follows meeting the Standard and addressing the gaps.
Fiona Love
Principal Manager - Capability Services
Organisational Development, TfNSW
Collaborative Competency Delivery Model

Sets the **Generic competency requirements** for specific (critical) functions & publish on behalf of TfNSW for the AEO population.

Provides the **Product and Domain competency requirements & information**

Supports the provision of education, competency and training products and services to enable industry to meet the competency requirements.
The Clients and the Problem

The problem they have:

- No well targeted or useable educational pathway
- No defined competence standards in some areas
- Opaque internal systems that allow contractors to be productive

The scale of the problem:

- Across all industry sectors.
Our challenge is …
Create a Capability Framework

Rail Control Systems

Step 1
Step 2
Step 3
Step 4

Configure Design Test Verify

Competency A Competency B Competency C

AQF Level 8 Graduate Certificate in Rail Control Systems
Develop a series of e-learning modules
Develop an Assessment Framework for Recognition of Current Competence
Develop an Authorisation Process
The Solution…

Step 1: Generic Rail Control Systems Program

Step 2: Product-specific Program - ATRICS

Step 3: Evidence Portfolio
**Rail Control Systems Capability Framework**

### Generic (AQF)

- Graduate Certificate in Rail Control Systems AQF 8
- ASA Competency Pathway – Control Systems.

### Domain (Enterprise)

- SX52 – Safely Access Rail Corridor (RISI)
- Access to live locations.
- Safety Management System (Sydney Trains SMS)

### Product

- **Products and Systems Training and Accreditation**
  - ATRICS
  - Phoenix
  - VICOSS
  - SIGVIEW
- Core Functionality
- Systems Data Manager
- Classes of Data
- Data design / infrastructure design modules
- Deployment and Commissioning.

### Authorisation and commissioning

#### Underpinning engineering qualification

**Course** | **Underpinning Knowledge**
---|---
**Intro** | Rail Networks, Infrastructure and Terminology Control Systems Interlocking Telemetry System
**Design** | - Scoping The Project
- Designing Control System Data
- Designing Infrastructure
**Build** | Build Infrastructure Load Software
**Test** | - Testing Control Systems
- Commissioning Control Systems
What else is happening?

• Sieving exercises to develop domain and product programs
• Broader access to Transport Training Centre
• Exploring new learning technologies such as e-learning info/graphics, apps
• Ensuring greater use of required capability frameworks such as Engineers Australia to minimise barriers to recognition of professional standards knowledge
• Advising and collaborating with major AEO’s to design accreditation
• How are systems that are risk base accessible and support efficiency and productivity
• Establishing a glossary of terms for all parties within the transport cluster

August 2015
Sieving exercises to develop domain and product programs
Broader Access to Transport Training Centre
Exploring new learning technologies such as e-learning info/graphics, apps

- Build 10 e learning modules (Generic)
Ensuring greater use of required capability frameworks such as Engineers Australia to minimise barriers to recognition of professional standards knowledge
Advising and collaborating with major AEO’s
How are systems that are risk based accessible and support efficiency and productivity
## Establishing a Glossary of Terms

**TNSW - Glossary of Terms**

### Abbreviations/ Terms  | Descriptions
--- | ---
0:20:10 | A model for indicating a combination of on the job, coaching and formal learning approach to development.
Accreditation | Accreditation is the process in which certification of competence, authority, or equivalency is presented that complies with defined standards.
Accredited Course | A program of learning that comprises one or more components (e.g. units of competency, modules or subjects) that has been endorsed by an accrediting authority.
Accredited person | An individual who has demonstrated competence and been deemed suitable to hold the accreditation by an AEO (and as required, a RIM).
AEO | Authorised Engineering Organisation. A supplier of a defined engineering service or product that has been assessed and granted AEO status by TNSW.
AQF | Australian Qualifications Framework.
ASA | Asset Standards Authority
ASQA | Australian Skills Quality Authority. The national regulator for Australia’s vocational education and training sector
Assessment (of competence) | The process of collecting a range of evidence and making judgements on whether competence has been achieved to confirm that an individual can perform to the standards expected in the workplace.
Authorisation | The internal process whereby a responsible entity deems a product, service or individual complaint to requirements and regulatory and legislative mandates.
Capabilities | The knowledge skills and abilities to perform a role effectively.
Certification | The verification and authentication of a learner’s entitlement to recognition.
Commissioning | The systematic process of ensuring that all equipment and systems perform interactively according to the design intent and the operational and user requirements.
Competence | The identification and application of knowledge, skills and behaviours required to perform tasks to the standards required.

Additional information:
- Accreditation - From a product supplier or SME to carry out asset lifecycle e.g. tools, hardware and specialized described on an approved asset list.
- Accreditation - Issued by a relevant approved body, in recognition of prior learning outcomes or competencies relevant professional, industry or commercial needs.
- Accreditation - An organisation defined engineering service or product that has been assessed and granted AEO status by TNSW.

**Australian Qualifications Framework**

**The process**

1. Collect a range of evidence and make judgements on whether competence has been achieved.
2. Confirm that an individual can perform to the standards expected in the workplace.

**The process**

1. Verify and authenticate a learner’s entitlement to recognition.
2. Ensure that all equipment and systems perform interactively according to the design intent and the operational and user requirements.

**Competence**

- The identification and application of knowledge, skills and behaviours required to perform tasks to the standards required.
- An individual who has demonstrated competence and been deemed suitable to hold the accreditation by an AEO (and as required, a RIM).

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Omer Saricilar
Principal Engineer, Control Systems
Asset Standards Authority
1. Something Simple

2. Train Control Systems
   - Design Examples
   - Components
   - Competency Examples

3. Customisation

4. Questions
An Analogy………

Control Systems are normally very complex. We will start with something everybody knows and uses………

When you buy a car:

• You know the reasons behind common functionalities, such why the car should have a powertrain, what the powertrain does, what are the parameters of powertrain.

• Using the common knowledge, you can understand the common specific functionalities of the powertrain of the specific car and you can make a comparison.

• Without such common knowledge, you may not understand the specific functionalities, such as what is rev, torque, cylinders, kW, hp etc…

• Only common knowledge is transferable between cars – for example knowledge about turbo charge may not transferable, unless it is common to all cars.
An Analogy – cont’d

All **vehicles** may have the following minimum components:

- Powertrain
- Transmission capabilities
- Steering capabilities
- Braking capabilities
- Etc…

All **cars** have the minimum components

- All vehicles’ minimum components
- Signalling capabilities
- Seating capabilities
- Night driving capabilities
- Protection against weather
- Etc…
An Analogy— cont’d

There are levels of knowledge:

• Generic: applicable for all levels which are specialisations of this knowledge such as vehicle.

• Domain specific: may not be transferable to other domains, such as bicycle vs car.

• There could be more layers depending upon the system’s complexity and configuration.

It is normally assumed that

• Generic knowledge is transferable, re-usable and an enabler for domain knowledge.

• Domain specific knowledge is not directly transferable, re-usable and an enabler for other domain knowledge. But it enhances and supports the generic knowledge and creates experiences.
Venn Diagram - 1880 by John Venn

Vehicle

Bicycle

Truck

Car

F1 Car
Train Control Systems (TCS)
Production Components of TCS

- **Generic Product** – normally software and associated tools

- **Infrastructure** – environment the product and its configuration reside and perform:
  - IT and associated software/firmware
  - Networking
  - Interfacing to signalling systems
  - Electrical
  - Environment

- **Configuration** – adapts the generic product and its infrastructure to the specific application:
  - Signalling
  - Operation
  - Infrastructure

- **Testing** – needs to cover all three areas.
ATRICS Infrastructure
Proposed Main West Infrastructure
Infrastructure Components

UNCOMMON COMPONENTS

• Overall design
• Types of Servers
• Types of Workstations
• SOE (Standard Operating Environment)
• Types of Routers/Switches/Firewalls
• Network Configurations
• Telemetry Interfaces
• Electrical Interfaces
• Etc…

COMMON COMPONENTS

• Overall design
• Servers
• Workstations
• SOE (Standard Operating Environment)
• Routers/Switches/Firewalls
• Network Configurations
• Telemetry Interfaces
• Electrical Interfaces
• Etc…
Common Engineering Knowledge

- **Understanding business requirements**
  - Signalling
  - Operational
  - Maintenance

- **Translating business requirements** to specific control systems’ requirements

- **Translating non-functional requirements** to specific control systems’ requirements (such as RAM)

- **Translating safety requirements** to specific control systems’ requirements

- **Translating control systems requirements** to components’ requirements

- Design or modify the existing design to implement component requirements

- Etc…
Common Engineering Knowledge – cont’d

- Information Technology
- Networking Technology
- Electrical Engineering
- Electronic Engineering
- EMI
- RAMS
- Testing
A TCS Example

• Business Requirements:

  ✓ Modification and expansion of the existing train yard with an additional interlocking – more tracks, points and new operational rules.

• Control Systems Requirements – *Element 2*:

  ✓ Adding and modifying maps, IO tables, rules, alarms
  ✓ Addition of new interlocking
  ✓ Safety and non-functional performances
  ✓ Etc…
A TCS Example– cont’d

• Infrastructure Requirements – *Element 3:*

  • Handling new interlocking
  • Handling new workstation – existing workstation cannot handle it due to limited real estate.
  • Modification of network to handle new workstation
  • Not affecting the existing RAM requirements due to new hardware
  • Not introducing new hazards and affecting existing hazard
  • Etc…
### A TCS Example – cont’d

<table>
<thead>
<tr>
<th>Elements</th>
<th>Evidence criteria</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishes infrastructure design and</td>
<td>Identifies and allocates infrastructure related requirements from the Project Scope and Control</td>
<td>Analyses control systems functional specifications, control systems circuit</td>
</tr>
<tr>
<td>construction requirements</td>
<td>Systems Functional Specification to:</td>
<td>books and any other relevant input documents to identify and confirm:</td>
</tr>
<tr>
<td></td>
<td>- determine the functionality required by existing or new infrastructure components</td>
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<td></td>
<td>- determine what infrastructure needs to be installed, modified and disposed of to ensure all</td>
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<td>operation, maintenance, training, support and disposal requirements have been addressed</td>
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<td></td>
<td>- identify and update RAM requirements</td>
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<td>- ensure hardware specification factors are incorporated and accommodated</td>
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<td>- establish whether components outside the standard operating environment will be required</td>
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<td>- identify hazards or allocate hazards or both related to the infrastructure</td>
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<td>3.4</td>
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</tbody>
</table>
A TCS Example—cont’d

Infrastructure Design – *Element 4:*

- Workstation only:
  - Existing workstation design will be used with brand new hardware – since not available anymore. Check and verify against
    - Applicable standards,
    - Identified interfaces,
    - Required RAM
    - Existing or newly identified safety hazards
    - Addressing existing issues/problems - improvements
- Proposed testing plan
- Create and submit type approval document.
A TCS Example—cont’d

<table>
<thead>
<tr>
<th>Elements</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>4.4 evaluates the feasibility of all possible design solutions and selects the optimum design which meets identified design, construction, maintenance, and business constraints.</td>
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<td>4.5 identifies designs and develops preliminary tests in order to mitigate previously identified risks, safety and interface issues.</td>
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<td>4.6 assesses whether or not &quot;type approval&quot; is required for any assets and initiate type approval.</td>
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<td>4.7 initiates &quot;ASA concession&quot; process if the design does not comply with standards.</td>
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<td>4.8 identifies analyses and documents all new or modified configuration data applicable to the new or modified systems for the infrastructure.</td>
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<td>4.9 documents the design, using appropriate software tools to produce detailed diagrams and drawings.</td>
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<td>4.10 validates design quality and completeness, ensuring that:</td>
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<td>• it meets the requirements of the Control Systems Functional Specification</td>
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<td>• it complies with all relevant standards</td>
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<tr>
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<td></td>
<td>4.11 presents the design solution, ensuring all stakeholders understand the merits of the design, and how it meets the project requirements.</td>
</tr>
</tbody>
</table>
What is a Standard?

- Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices.

- The definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength.

http://www.nist.gov/standardsgov/definestandards.cfm

Is it voluntary to adopt:

- Some cases it is, e.g. “adoption of IEC standards by any country, whether it is a member of the Commission or not, is entirely voluntary.” http://www.iec.ch/standardsdev/publications/is.htm

- TfNSW cases it is mandatory.
ASA Charter Functions

- Technical Capability
- AEO Obligations
- Transport Agency Obligations
The Asset Life Cycle

Enterprise Life Cycle Stages

- Business Development
- Project Definition
- Project Execution
- Asset & Service Life

System Life Cycle Stages

- Exploratory
- Concept
- Development
- Production
- Utilization
- Retirement

Phases

** ISO-15288 Standard

- Stakeholder & User Needs
- Capacity & Requirements
- Feasibility
- System Requirements & Concept
- Preliminary Design
-详细设计
- Fabrication & Manufacture
- Construction & Integration
- Inspection & Test
- Commissioning
- Operations & Maintenance
- Decommission & Disposal

Life Cycle Baseline Stage Gateways

- Exploratory
- Concept
- Preliminary
- Build
- Post Build
- Validation
- Operating
- Retirement
Elements vs Asset Lifecycle - cont

- **Elements 01**: Establishes design assurance requirements
- **Elements 02**: Establishes control systems documentation
- **Elements 03**: Establishes infrastructure design and construction requirements
- **Elements 04**: Develops a design and construction solution that meets project requirements
- **Elements 05**: Develops the installation work packages and test plans
- **Elements 06**: Undertakes peer or independent review or both
- **Elements 07**: Procures and tests infrastructure components
- **Elements 08**: Approves
- **Elements 09**: Establishes and prepares installation requirements
- **Elements 10**: Maintains quality control during installation works
- **Elements 11**: Installs and configures infrastructure components and parts
- **Elements 12**: Decommissions and removes existing infrastructure
- **Elements 13**: Completes post installation activities
- **Elements 14**: Verifies installed infrastructure
- **Elements 15**: Audits installed infrastructure
Is this a Straitjacket?

Each AEO and Transport Agency (may not be AEO) may have different:

- Authorisation scope
- Engineering framework
- Processes and procedures
- Competency framework
- Products
- Services
- Culture

An example:

- Based on ASA asset lifecycle guideline, procurement happens before the design. Design is based on the procured or existing product.

- An AEO may do design first and procure the product to meet design parameters.
Customisation & Flexibility

Normally all requirements within the standard must be complied

• If an AEO can not comply the requirement, must seek “concession” from ASA before the design phase, which may be accepted or rejected or standard may be updated.

• If an AEO’s implementation does not fulfil the standard’s requirements, it is called “non-conformant” & treated accordingly.

But this particular case, ASA is giving power to tailor the standard as detailed in T MU CY 01000 GU TfNSW Competency Standards Guidelines and Glossary v1.0 as long as:

• Customisation to the standards must be justified and will be auditable by ASA

• Unacceptable to customise the evidence criteria against elements.
Competency
Jocelyn Edwards, Manager Competency Systems
How does it all fit together?

Competency Guidelines and Glossary

Competency Pathways Standards
Ongoing Work Plans

• The Standard and Guidelines - collaborative development

• Structure of the standards, definitions and how the variables work.

• Further work is underway in Control Systems, Signalling and Electrical.
TfNSW Competency Pathways – Control Systems

- Version 1 - Published July 2015
- Effective October 2015
- A Standard which sets the minimum generic requirements
- Developed as a collaboration project between ASA, Sydney Trains and TfNSW OD.
The Standard

• Establishes **pathways** and generic competency requirements to perform functions within the control systems discipline.

• Provides additional information to an AEO for the development of its **auditable competency management system** (CMS).

• Provides guidance to enable assessment of personnel who are required to demonstrate competency.
### Pathways

<table>
<thead>
<tr>
<th>New entrants</th>
<th>Skilled and Experienced</th>
<th>Transferable Skills</th>
</tr>
</thead>
</table>
| • This pathway will identify the pre-requisite qualifications and training requirements for those personnel with little to no experience | • Personnel with current or previous experience working on the TfNSW rail network  
• Demonstrate domain or product knowledge | • Personnel who are able to demonstrate they have some of the skills and knowledge to carry functions  
• Includes personnel with National or/or International experience |
Roles Vs Functions

• The competency standards describe the generic competencies that are relevant to functions or tasks.

• ASA has elected to specify functions that exist over the Asset life Cycle as opposed to Roles.
Standards - ASA business activities

Alignment to international and professional standards
- Overseas Frameworks (e.g. IRSE)
- Washington Accord Agreement
- Professional Bodies & Institutes

Alignment to AQF (where possible)
- Developing National Competencies & UOC’s
- Vocational Education & Higher Education alignment
- Accreditation
TfNSW Competency Standards, Guidelines and Glossary

Published July 2015
Effective October 2015

*It is a Guide*, not a Standard

Assurance still needs to be done by AEOs
Where can I find the standards and guide?

Here’s where you find them...


Published July 2015
Effective October 2015
Morning Tea
Competency: detailed overview
Jocelyn Edwards, Manager Competency Systems
## Structure of the competency standards

### Functions:
A specialty area of a role usually comprised of a collection of tasks.

### Elements:
Describes the activities or tasks for which a function might be needed to be competent.

### Evidence Criteria:
Assigned under Elements and expresses an expectation of what a competent person would do in terms of observable results and behaviours.

### Standard Title:
The discipline area covered by the Standard.

### Variables:
References the variables, located in the following section of the Standard, and relevant to the Evidence Criteria. The variables contained within each list guides the user to the relevant domain/product knowledge or further specific items to be selected and used for assessment.

### Table X - ASA Control System Infrastructure Design and Construct Generic Competencies

<table>
<thead>
<tr>
<th>Elements</th>
<th>Evidence criteria</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Design</td>
<td>Check</td>
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<tr>
<td>10.1</td>
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<td>N</td>
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<td>10.2</td>
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<td>11.1</td>
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<td>11.2</td>
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<td>11.3</td>
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<td>N</td>
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</tbody>
</table>

August 2015
Variable Examples

C.2.12 Relevant standards
The relevant standards should include:
- ASA standards
- workplace health and safety standards
- rail safety legislation and requirements
- international standards
- Australian standards
- RISSB standards
- TfNSW standards
- AEO’s standards

C.2.17 Post installation documents
The post installation documents should include:
- marked up and signed circuit books
- completed checklists for installed equipment
- test results
- status report
- updated configuration files
Flexibility of the standards

- Can be tailored to fit AEO organisation
- Language can be revised but careful not to lose the essence
- Elements can be discounted

However...

- Must be justified and will be auditable by ASA
- No customisation of evidence criteria against elements
Additional Notes

• The specific competency attributes that underpin expected performance are embedded within the Elements and Evidence Criteria.

• These are expected behavioural and ‘soft skill’ attributes. They are common core competencies such as:
  • the ability to communicate effectively,
  • the capacity to problem-solve,
  • risk adversity
  • accept responsibility and accountability.

• This allows the Competency Standards to serve as a measure of expected performance against which actual performance can be assessed and evidenced by an AEO.
Proficiency levels

AEOs shall define the proficiency levels.

The following proficiency levels have been provided as guidance:

• Level 1
  – can perform the identified competency independently and without supervision in complex activities. Can produce quality outcomes based on the relevant standards and AEO’s process and procedures.

• Level 2
  – can perform the identified competency for less complex activities without supervision or can perform the identified competency in complex activities under supervision or both. Can produce quality outcomes based on the relevant standards and AEO’s process and procedures.
Customisation of the standards

The process of customising the standards to create a profile showing required competencies for specific roles or services is:

- **Step 1**: Select the function defining key activities of the role or work under consideration.

- **Step 2**: Assess and select the Elements that represent the key to these functions or services.

- **Step 3**: Incorporate the Evidence Criteria specified against the selected Elements.

- **Step 4**: Assess and select the variables applicable to each Evidence Criteria.

- **Step 5**: Use the selections made in Steps 1 to 4 to complete the profile for the work being carried out and evidence appropriately.
Practical Exercise

We will carry out an exercise to demonstrate the use of the Standard and look at how it can be integrated into the AEO’s competency management system.
Assessment

“The process of collecting evidence and making judgment's on the nature and extent of progress towards the performance requirements set out in a standard or a learning outcome, and, at the appropriate point, making the judgment as to whether the competency has been achieved." VEETAC 1993
Evidence – Getting the Balance Right

Summative
Making a judgment based on all evidences, where learning has ended and cumulative evidences allow the assessor to determine competency sufficient to award a competency outcome.
Types of Evidence

It is important that the evidence is:
✓ Current
✓ Authentic
✓ Relevant
✓ Sufficient

Direct evidence
• e.g. observation from previous work, references from employers or clients

Indirect evidence
• e.g. written or oral questions

Supplementary evidence
• E.g. reports, logbook, project plans
<table>
<thead>
<tr>
<th>Elements</th>
<th>Evidence criteria</th>
<th>Appropriate evidence examples</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Develops a quality design and construction solution that meets project requirements | Identifies, interprets and analyses the relevant design, industry and regulatory standards and design the infrastructure solutions to comply | • design reports or plans  
• interviews  
• log books  
• references | • Existing for employees?  
• Ease of access in HR/HRIS  
• Currency  
• Sufficiency |
| Undertakes peer review or independent review or both                     | Provides constructive feedback to the designer, questioning and challenging decisions made | • meeting minutes  
• design review comments registers  
• reports of corrective actions  
• reassessment engineer reports |                                                                                          |
Workshop Example

• Work in groups according to your seating

• Elect spokesperson

• Use sample assessment tool to determine appropriate evidence types against the Elements of Competency
  – Consider relevancy and sufficiency of evidence
  – Consider proficiency levels

• Please record evidence types on the provided flip charts.
Sample Assessment Tool

Sample Assessment Evidence Tool

<table>
<thead>
<tr>
<th>Function: Control Systems <strong>Infrastructure Design</strong></th>
<th>Impact Observation</th>
<th>Verbal Summaries</th>
<th>Log Book</th>
<th>Third Party Verification</th>
<th>Other &amp; Non-Routine Evidence</th>
</tr>
</thead>
</table>

**Elements of Competency**

- The mapping is done at the element level, not for each performance criterion.
- This assessment covers various aspects of an employee's performance, technical skills and previous experience which can help to form a view of their competence.
- Not all methods of gathering supporting evidence need to be used for each element. The assessor should gather enough evidence to determine the employee's competence, which may be one or more pieces of evidence, depending on the quality of that evidence.

Tick (✓) the box as Satisfactory if evidence provided shows satisfactory performance overall for that particular element.

<table>
<thead>
<tr>
<th>1. Establishes design assurance requirements</th>
<th>Applicable</th>
<th>Yes or No</th>
<th>Satisfactory ✓ or X</th>
<th>List evidence applicable to variables (Appendix C2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Identifies and consults all stakeholders relevant to the project scope, and identifies impact to other projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2. Ensures the document package is current, complete, applicable, accurate, and clear and where there are discrepancies, takes corrective action.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3. Identifies, documents and schedules activities required to complete the work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4. Maintains quality of documents through records management throughout the project life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Establishes control systems documentation</th>
<th>Applicable</th>
<th>Yes or No</th>
<th>Satisfactory ✓ or X</th>
<th>List evidence applicable to variables (Appendix C2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1. Creates concept and feasibility documents including supporting evidence for design decisions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2. Interprets and analyses project scope, relevant Functional and Interface Specifications, other documents determining the impacts of the project on existing control systems and respective interfaces as well as existing projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3. Identifies applicable AEC processes and procedures, relevant standards to the project scope, gaps in the relevant standards and addresses gaps as a risk and mitigates as appropriate and compliant.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Customisation of the standards

The process of customising the standards to create a profile showing required competencies for specific roles or services is:

- **Step 1**: Select the function defining key activities of the role or work under consideration.

- **Step 2**: Assess and select the Elements that represent the key to these functions or services.

- **Step 3**: Incorporate the Evidence Criteria specified against the selected Elements.

- **Step 4**: Assess and select the variables applicable to each Evidence Criteria.

- **Step 5**: Use the selections made in Steps 1 to 4 to complete the profile for the work being carried out and evidence appropriately.
Activity Feedback & Discussion

• What were the challenges?
  ➢ Sufficiency of information
  ➢ Quality of information
  ➢ Currency of information

• Type of evidences

• Assessors
  ➢ Finding suitable assessors
  ➢ Checking quality of assessment
Contact details
02 9422 7187
info@asa.transport.nsw.gov.au
Thank you!