

# The people behind digitisation: Identifying competencies to make it work

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# Employee engagement



**“A company’s employees are its greatest asset and your people are your product” – Richard Branson**

**“People are not your most important asset. The *right* people are” – Jim Collins, (author of Good to Great)**



## Employer Focus Areas

- **Recruitment**
- **Succession planning**
- **Benchmarking of skills**
- **Retention**

# Current Climate – Common Issues

## Too costly to retain, too old to hire



### Retrenchment in Singapore.

- Nearly two-thirds were aged 40 and above
- 71% were professionals, managers, executives and technicians
- **Older workers targeted since their skills may be outdated** and more costly to employers.

## 400,000 unemployed in M'sia, mostly graduates

May 12, 2015

Minister says 161,000 graduates or 8.8 per cent of youths, aged between 20 and 24 years, had yet to find a job.

Malaysia



***The main reason given by the firms for this is that the applicants did not have the required basic skills or the right technical skills needed to carry out the jobs in question.” – World Bank, as quoted in OECD report***

# Competence Framework - Rationale

- **Organisational competitiveness: “our staff are our greatest asset”**
- **Ensuring the “right” people are in the “right” job – succession planning, recruitment, retention strategy etc**
- **Provides greater clarity of a role, responsibilities and expectations**
- **Provides flexibility to organisations**
- **Developing a life long learning plan**
- **Keeps an ageing workforce relevant**
- **Assists with the demand for qualified workers**
- **Government requirements (in many countries)**

# Defining Competencies

**Consists of underpinning knowledge, skill, behaviour, attitude & ability to successfully perform a task**

**Identifying what constitutes a “task” is very important as is its work place “context”**

- Too broad a scope means it will be difficult to measure effectively
- Too narrow a scope implies too many competences per job and less transferability. This is hard to manage

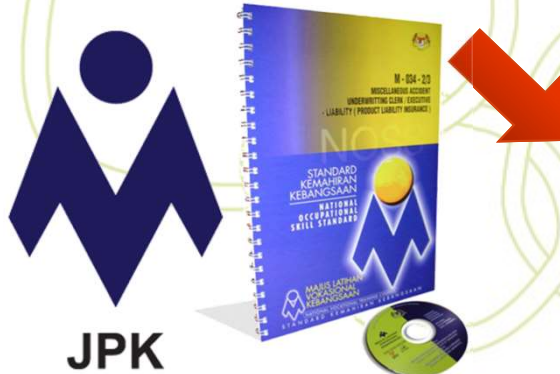
**Effective measurement/evaluation is critical. This is a major pitfall.**

- There is little point having competences set that cannot be measured effectively
- How is it measured, what is the benchmark, who is qualified to do the measurement?

# Framework for O&G

**OCCUPATIONAL ANALYSIS  
OIL & GAS INDUSTRY  
(identify critical roles)**

*Our focus is currently on  
ICT/Security*



## Extract:

- Competency Areas
- Role requirements



**Look at those competencies in wide  
demand across industry.  
This will keep your staff relevant &  
be able to transfer roles more easily**

## Define:

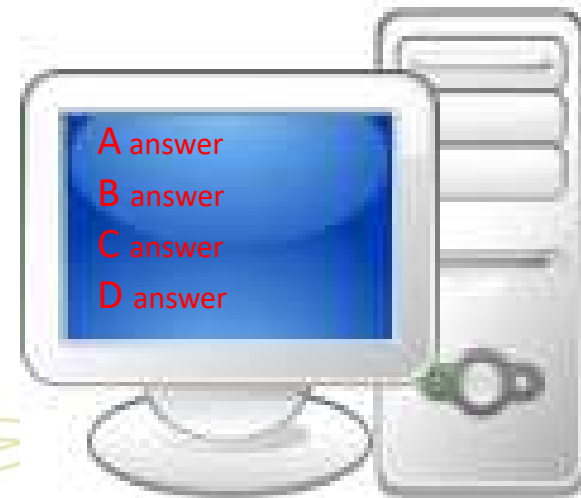
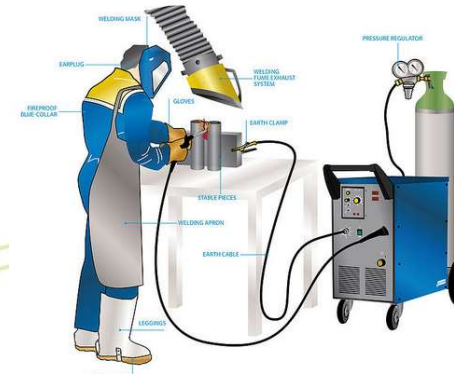
- Grouping of competencies
- Transferable competencies

# Measuring Competence

- **Welding:** Can demonstrate the use of an arc welder
  - (considerations: standards, environment, materials etc)
- **Computer Networking:** Is able to answer multiple choice questions
- **Security:** Is able to answer multiple choice questions
- **Microsoft®:** Is able to answer multiple choice questions

In the 1990s something fast & easy was needed and is still used. Is it adequate now? Is it meeting our needs/measuring effectively?

Correct and safe electric welding station

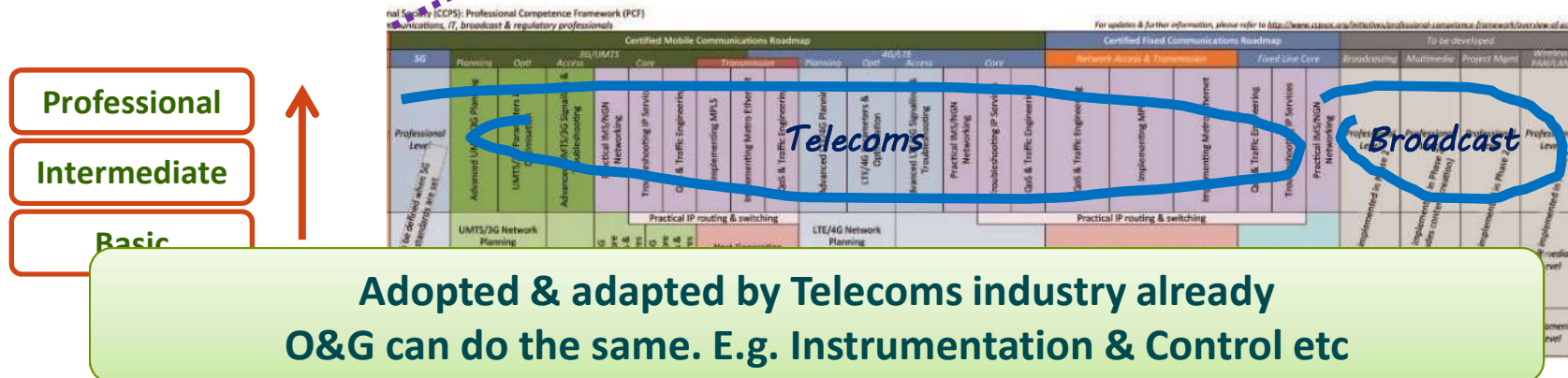
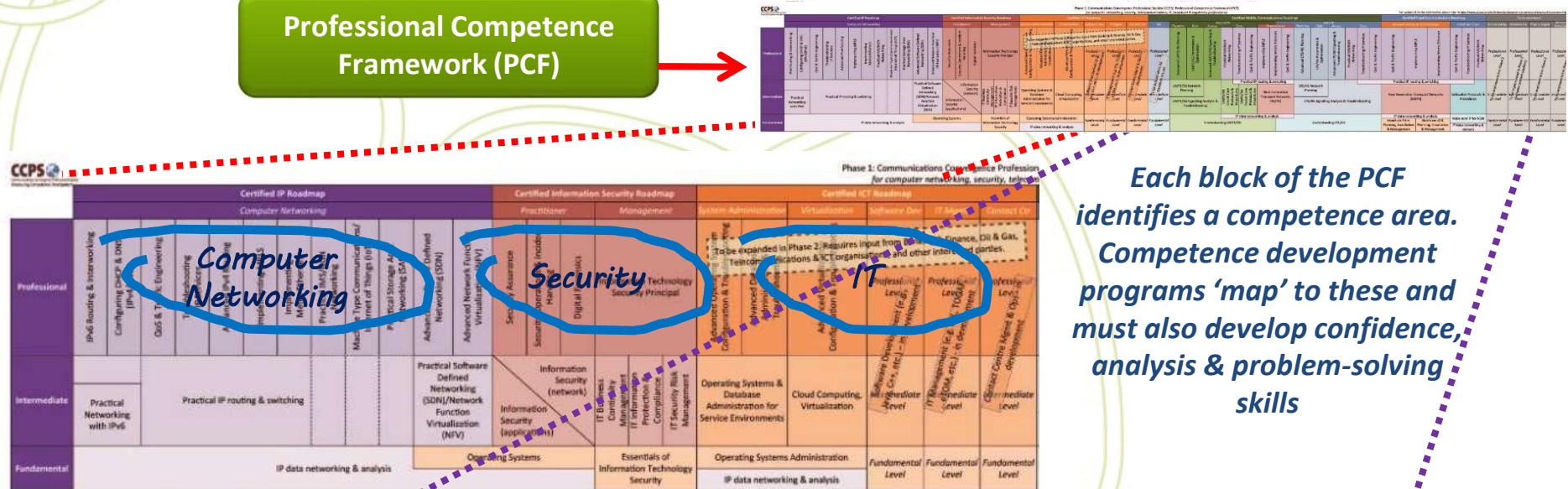


## Methodology

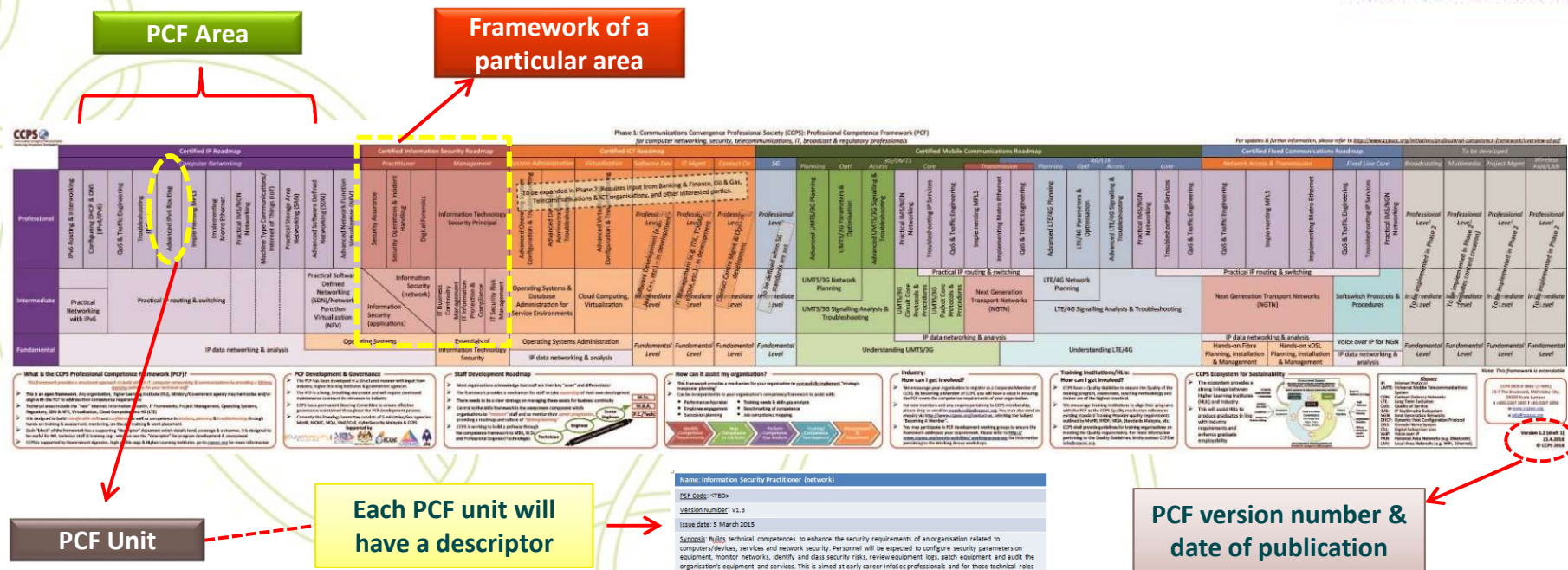
- **Start with an area that has transferability across the industry**
- **“Adapt and Adopt” from other frameworks where appropriate**
- **Course of Action:**
  - Target IT to define skills requirements for digitisation of the Oil & Gas industry
  - Leverage on work already done by the Communications Convergence Professional Society (CCPS)

# Example Competency Framework: The Professional Competence Framework (PCF)

## Professional Competence Framework (PCF)



# PCF Various Parts



- The PCF is an **enabler** for organisations, educational & training institutes and individuals
  - Human Resource teams & Technical Teams need to work closely together to manage “people: our greatest asset”
  - The PCF is a **common language** between HR & technical teams that facilitates this dialogue
- Descriptors are the dictionary

|   |   |         |   |                              |   |                        |   |                   |  |
|---|---|---------|---|------------------------------|---|------------------------|---|-------------------|--|
| Name: Information Security Practitioner (network)   |   |         |   |                              |   |                        |   |                   |  |
| PCF Code: <TBD>   |   |         |   |                              |   |                        |   |                   |  |
| Version number: v1.3  |   |         |   |                              |   |                        |   |                   |  |
| Issue date: 9 March 2013  |   |         |   |                              |   |                        |   |                   |  |
| <p><b>Summary:</b> Build technical competences to enhance the security requirements of an organisation related to computers/devices, services and network security. Personnel will be expected to configure security parameters on equipment, monitor networks, identify and class security risks, review equipment logs, patch equipment and audit the organisations equipment and services. This is aimed at early career infosec professionals and for those technical roles where information security is not their core function however they are required to embrace security principles &amp; practices in their work.</p> <p><b>Target job roles:</b> Technical staff including: Telecoms Engineers/Technicians, IT Professionals, Datacommunications Engineers, Security Professionals, Software Engineers &amp; Testers</p> <p><b>Industry Sectors:</b> Applicable to a range of industry segments including: telecoms, ICT, banking &amp; finance, O&amp;G, government, broadcasting, etc.</p> <p><b>Identified Performance Statements:</b></p> <ol style="list-style-type: none"> <li>1. Understands the end to end information security process</li> <li>2. Understands issues related to information security</li> <li>3. Source, select and utilise appropriate security tools given a requirement</li> <li>4. Evaluate solutions to protect against malware such as viruses, trojans and social engineering attacks</li> <li>5. Develop &amp; implement procedures for basic log analysis</li> <li>6. Investigate procedures for hardening of operating systems and applications</li> <li>7. Perform basic implementation of VPN, firewall &amp; IDS/IPS systems, including writing of robust rules</li> <li>8. Perform risk assessment and recommend basic treatment for a range of scenarios including: wireless/mobile, appliances and servers</li> </ol> <p><b>Attributes:</b></p> <table border="1"> <tr> <td>Ethical</td><td>able to maintain ethical conduct &amp; act as a role model in the execution of duties related to information security</td></tr> <tr> <td>Confidence &amp; Self Motivation</td><td>able to use judgement, make decisions and apply solutions with confidence</td></tr> <tr> <td>Problem-solving skills</td><td>able to work independently to identify, troubleshoot and solve problems related to information security</td></tr> <tr> <td>Evaluation skills</td><td>able to evaluate and assess solutions relating to information security systems</td></tr> </table> |   | Ethical | able to maintain ethical conduct & act as a role model in the execution of duties related to information security | Confidence & Self Motivation | able to use judgement, make decisions and apply solutions with confidence | Problem-solving skills | able to work independently to identify, troubleshoot and solve problems related to information security | Evaluation skills | able to evaluate and assess solutions relating to information security systems |
| Ethical   | able to maintain ethical conduct & act as a role model in the execution of duties related to information security |         |   |                              |   |                        |   |                   |  |
| Confidence & Self Motivation  | able to use judgement, make decisions and apply solutions with confidence   |         |   |                              |   |                        |   |                   |  |
| Problem-solving skills  | able to work independently to identify, troubleshoot and solve problems related to information security           |         |   |                              |   |                        |   |                   |  |
| Evaluation skills   | able to evaluate and assess solutions relating to information security systems                                    |         |   |                              |   |                        |   |                   |  |

# PCF Descriptors

Useful for non-technical to identify specific program

Useful for management to get program area

Useful for HR to identify which roles this competence area is for

**Name:** Information Security Practitioner

**PSF Code:** <TBD>

**Version Number:** v1.0

**Issue date:** 20 February 2014

**Synopsis:** Builds technical competences to enhance the security requirements of an organisation related to computers/devices, services and network security. Personnel will be expected to configure security parameters on equipment, monitor networks, identify and class security risks, review equipment logs, patch equipment and audit the organisation's equipment and services. The person in this role will bring information security practices and tasks to their day to day work, even if not directly related to security.

**Target Job Roles:**

Technical staff including: Telecoms Engineers/Technicians, IT Professionals, Datacommunications Engineers, Security Professionals, Software Engineers & Testers

**Industry Segments:**

Applicable to a range of industry segments including telecoms, ICT, banking & finance, O&G, government, broadcasting, etc.

**Identified competences:**

1. Explain issues related to security
2. Utilise a range of key security tools
3. Protect against malware such as viruses, trojans and social engineering attacks
4. Develop & implement procedures for logging and auditing
5. Perform operating system hardening
6. Implement a VPN, firewall & IDS/IPS solution
7. Identify risks & solutions for wireless/mobile network security
8. Perform security reviews

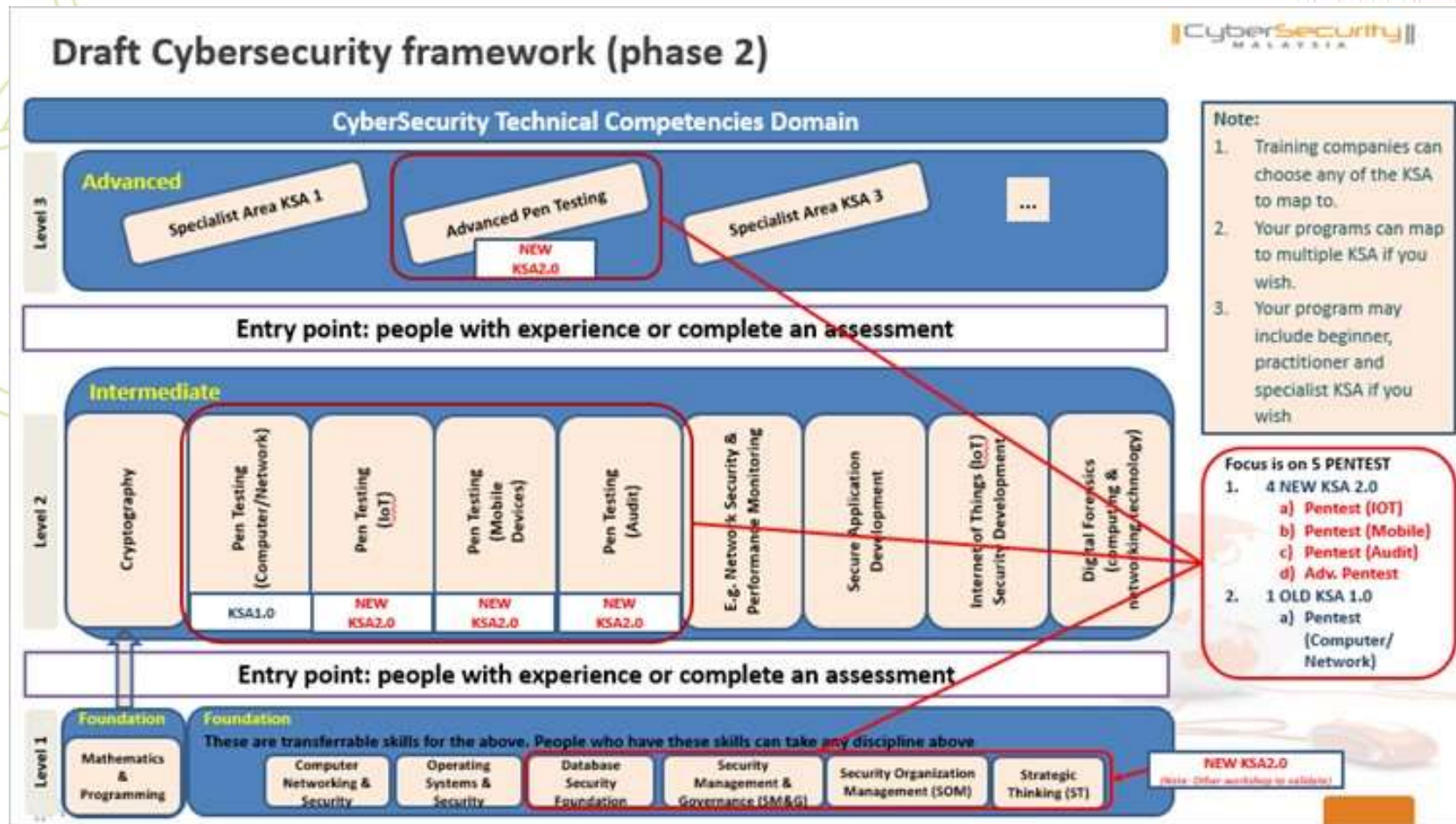
**Attributes:**

|                              |   |
|------------------------------|---|
| Confidence & Self Motivation | Able to use judgement, make decisions and apply solutions with confidence                               |
| Problem-solving skills       | Able to work independently to identify, troubleshoot and solve problems related to information security |
| Evaluation skills            | Able to evaluate and assess solutions to the design and troubleshooting of information security systems |
| Communication skills         | Able to perform documentation & construct reports in a structured and coherent manner                   |
| Analysis skills & critical   |   |

Useful for learning & dev to verify how up to date this is

Useful for talent management to know what people are "able to do"

# Cyber Security Framework



**We are working closely with CyberSecurity (MOSTI) and their framework is aligned and will be incorporated into the PCF**

# Example Framework – first cut

|                | UPSTREAM                 |                       |                          |                       |                             |              |          |               |          |           | MIDSTREAM              |        |                           |                        |                      |         |                |                               |       |   | DOWNSTREAM                       |                     |                                 |          |                |                            |                        |  |  |  |
|----------------|--------------------------|-----------------------|--------------------------|-----------------------|-----------------------------|--------------|----------|---------------|----------|-----------|------------------------|--------|---------------------------|------------------------|----------------------|---------|----------------|-------------------------------|-------|---|----------------------------------|---------------------|---------------------------------|----------|----------------|----------------------------|------------------------|--|--|--|
| EXPLOITATION   | Prospecting & Assessment | Reservoir Engineering | Surveillance Engineering | Production Technology | Well Completion Engineering | Well Testing | Economic | Well Drilling | Pipeline | Structure | Mechanical Engineering | Piping | Instrumentation & Control | Electrical Engineering | Material & Corrosion | Process | Process Safety | Hook-Up & Commissioning (HUC) | QA/QC | Engineering/Technical Document Management | Platform Operation & Maintenance | Platform Inspection | Platform Storage & Distribution | Refining | Gas Processing | Polymer Product Processing | Storage & Distribution |  |  |  |
| DESIGN/CONCEPT |                          |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |   |                                  |                     |                                 |          |                |                            |                        |  |  |  |
| IMPLEMENTATION |                          |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |   |                                  |                     |                                 |          |                |                            |                        |  |  |  |
| OPERATION      |                          |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |   |                                  |                     |                                 |          |                |                            |                        |  |  |  |

Upstream

Midstream

Downstream

| EXPLOITATION               |          |                         |                       | APPRAISAL                |                       |                             |              |          | UP-STREAM     |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  | DEVELOPMENT & PRODUCTION |                        |  |  |  |  |  |
|----------------------------|----------|-------------------------|-----------------------|--------------------------|-----------------------|-----------------------------|--------------|----------|---------------|----------|-----------|------------------------|--------|---------------------------|------------------------|----------------------|---------|----------------|-------------------------------|-------|--|----------------------------------|--------------------------|------------------------|--|--|--|--|--|
| Prospecting                | Drilling | Evaluation & Assessment | Reservoir Engineering | Surveillance Engineering | Production Technology | Well Completion Engineering | Well Testing | Economic | Well Drilling | Pipeline | Structure | Mechanical Engineering | Piping | Instrumentation & Control | Electrical Engineering | Material & Corrosion | Process | Process Safety | Hook-up & Commissioning (HUC) | QA/QC | Engineering/ Technical Document Management | Platform Operation & Maintenance | Platform Inspection      | Storage & Distribution |  |  |  |  |  |
|                            |          |                         |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  |                          |                        |  |  |  |  |  |
| Competencies to be defined |          |                         |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  |                          |                        |  |  |  |  |  |
|                            |          |                         |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  |                          |                        |  |  |  |  |  |
|                            |          |                         |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  |                          |                        |  |  |  |  |  |
|                            |          |                         |                       |                          |                       |                             |              |          |               |          |           |                        |        |                           |                        |                      |         |                |                               |       |  |                                  |                          |                        |  |  |  |  |  |

Competencies to be defined

| SUB SECTOR              |
|-------------------------|
| AREA                    |
| JOB AREA                |
| PROFESSIONAL/SPECIALIST |
| INTERMEDIATE            |
| FOUNDATION              |

| MIDSTREAM   |             |                               |                          |                 |                    |
|-------------|-------------|-------------------------------|--------------------------|-----------------|--------------------|
| PIPELINE    |             |                               | OFFSHORE VESSEL          |                 |                    |
| Engineering | Fabrication | Hook Up & Commissioning (HUC) | Operations & Maintenance | Deck Operations | Marine Engineering |
|             |             |                               |                          |                 |                    |
|             |             |                               |                          |                 |                    |

Competencies to be defined

**Note:**  
Once competencies are identified, upstream, downstream, etc. can be rearranged to reflect shared/transferable competencies

| CONSTRUCTION & ENGINEERING |            |            |            |         |               |                           |                   |                     |                   | DOWNSTREAM                                |       |            |            |        |                           |                           |                |                            |                        |
|----------------------------|------------|------------|------------|---------|---------------|---------------------------|-------------------|---------------------|-------------------|---|-------|------------|------------|--------|---------------------------|---------------------------|----------------|----------------------------|------------------------|
| Civil                      | Structural | Electrical | Mechanical | Process | Commissioning | Instrumentation & Control | Mechanical Piping | Mechanical Rotating | Mechanical Static | Engineering/Technical Document Management | Civil | Electrical | Mechanical | Piping | Instrumentation & Control | Gas Pipeline Transmission | Gas Processing | Polymer Product Processing | Storage & Distribution |
|                            |            |            |            |         |               |                           |                   |                     |                   |   |       |            |            |        |                           |                           |                |                            |                        |
|                            |            |            |            |         |               |                           |                   |                     |                   |   |       |            |            |        |                           |                           |                |                            |                        |

Competencies to be defined

# Example Section: Draft of Instrumentation & Control

|                             | INSTRUMENTATION & CONTROL |                                   |            |   |            | ELECTRICAL               |            |
|-----------------------------|---------------------------|-----------------------------------|------------|---|------------|--------------------------|------------|
|                             | Fabrication               | Design                            |            | Operations & Maintenance                        |            | Operations & Maintenance |            |
|                             | Upstream                  | Upstream                          | Downstream | Upstream  | Downstream | Upstream                 | Downstream |
| PROFESSIONAL/<br>SPECIALIST | tbd                       | tbd                               | tbd        | PLC, SCADA & $\mu$ C Programming & Interfacing  |            | tbd                      | tbd        |
| INTERMEDIATE                | tbd                       | tbd                               | tbd        | Instrumentation interfacing                     |            | tbd                      | tbd        |
|                             | tbd                       | tbd                               | tbd        | Digital Systems Troubleshooting & Fault Finding |            | tbd                      | tbd        |
| FOUNDATION                  | tbd                       | Draughtsman                       |            | Electrical Systems Operation & Maintenance      |            |                          |            |
|                             | tbd                       | Analog & Digital Systems Analysis |            |   | tbd        | tbd                      | tbd        |

...

Each of these would have a descriptor behind it to detail out the required KSAs

Transferability across areas/ disciplines

Note: this is draft only, areas to be further defined



Orbitage  
It's about communicating



# IT Framework for Oil & Gas

| Certified IP Roadmap |                                   |                                    |                           |                             |                       |                   |                             |   |   |  | Certified Information Security Roadmap         |  |   |  | Certified ICT Roadmap                     |                    |   |  |   |   |   |
|----------------------|-----------------------------------|------------------------------------|---------------------------|-----------------------------|-----------------------|-------------------|-----------------------------|---|---|--|--|--|---|--|---|--------------------|---|--|---|---|---|
| Computer Networking  |                                   |                                    |                           |                             |                       |                   |                             |   |   |  | Practitioner                                   |  | Management                                    |  | System Administration                     | Virtualization     | Data Analytics  | IT Mgmt  |   |   |   |
| Professional         | IPv6 Routing & Interworking       | Configuring DHCP & DNS (IPv4/IPv6) | QoS & Traffic Engineering | Troubleshooting IP Services | Advanced IPv4 Routing | Implementing MPLS | Implementing Metro Ethernet | Machine Type Communications/ Internet of Things (IoT)                             | Practical Storage Area Networking (SAN) | Advanced Software Defined Networking (SDN) | Advanced Network Function Virtualization (NFV) | Security Assurance                     | Security Operations & Incident Handling       | Digital Forensics  | Information Technology Security Principal |                    | Advanced Operating System Configuration & Troubleshooting | Advanced Database Administration & Troubleshooting | Advanced Virtualization Configuration & Troubleshooting | Professional Big Data Analytics e.g. Hadoop, Red Hadoop, etc. - tbd | Professional IT Management e.g. TIL, COGA, etc. - tbd |
|                      | Practical Networking with IPv6    | Practical IP routing & switching   |                           |                             |                       |                   |                             | Practical Software Defined Networking (SDN)/Network Function Virtualization (NFV) | Information Security (network)          | Information Security (applications)        | IT Business Continuity Management              | IT Information Protection & Compliance | IT Security Risk Management                   | Operating Systems & Database Administration for Service Environments | Cloud Computing, Virtualization           | Intermediate Level | Intermediate Level  | Intermediate Level                                 | Intermediate Level                                      | Intermediate Level  |   |
| Intermediate         | IP computer networking & analysis |                                    |                           |                             |                       |                   |                             |   |   |  | Operating Systems Administration               |  | Essentials of Information Technology Security |  | Operating Systems Administration          |                    | IP computer networking & analysis                         |  | Fundamental Level                                       | Fundamental Level   |   |
| Fundamental          | common, transferable skills       |                                    |                           |                             |                       |                   |                             |   |   |  |  |  |   |  |   |                    |   |  |   |   |   |

A foundation of common, transferable skills allows for movement between disciplines and reskilling of personnel

Adapted from the CCPS PCF  
Currently under review across the industry to incorporate and further align to Oil & Gas areas

## Benefits

- **Identifies competencies needed for Digital Transformation within O&G industry**
  - This supports the building of a workforce to meet the challenges presented
- **Provides a framework for skills development**
  - Organisations do not need to build their own
  - Can create a job role mapping from the competencies
- **Identifies transferability of skills across disciplines**
  - Assists with organisational flexibility, succession planning, competency gap analysis, recruitment, etc.
  - Shows lateral movements between disciplines
- **Facilitates clear dialog between HR and technical teams**
  - HR can focus on capability development from a strategic perspective while technical teams have a standard description outlining their competency requirements
- **Competence-based Assessment mapped to framework identifies who can “walk” the “talk”**
  - Provides a mechanism to assess staff capabilities against those competencies required by the job role

## Conclusions & Next Steps

- **Break the framework up into 'sections'**
- **Subject Matter Experts from O&G industry will assist to:**
  - Identify the core competencies required for each job role in the section
  - Identify which competencies can be shared & by which job roles
  - Group the competencies into appropriate areas
  - Map the competencies into the framework
  - Once completed & ratified, develop descriptors defining each competency

The background of the slide is a solid teal color. Overlaid on this is a series of white, hand-drawn style loops and swirls that create a sense of movement and connection. The text 'Thank You' is prominently displayed in white, bold, sans-serif font on the left side of the teal area.

**Thank You**

**Many thanks for your time and attention**

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