



Monitoring Maintenance Standards

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Evolution of Safety



Building Safety Foundations



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What are you currently measuring



What we **are actually** doing?



‘Work as imagined’ vs. ‘Work as done’

Design
(tools, roles, environment)



Work-As-Imagined

Work & production planning
("lean" - optimisation)



Work-As-Imagined

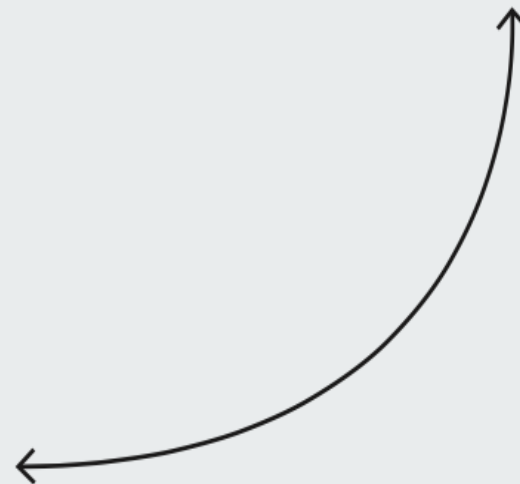
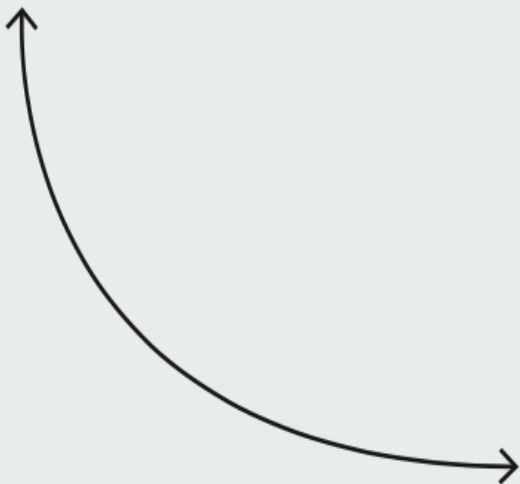
Safety management, investigations & auditing



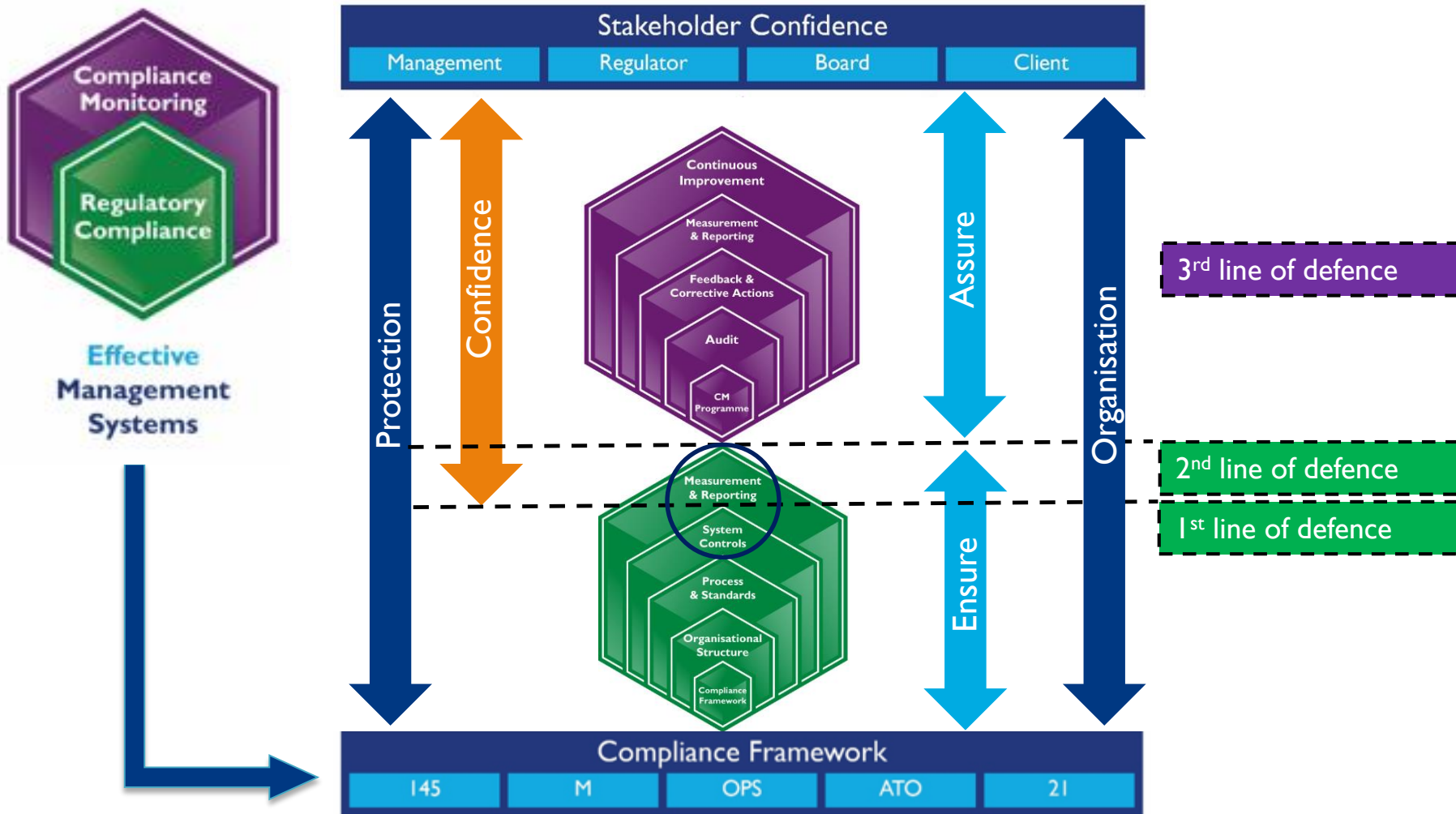
Work-As-Imagined



Work-As-Done



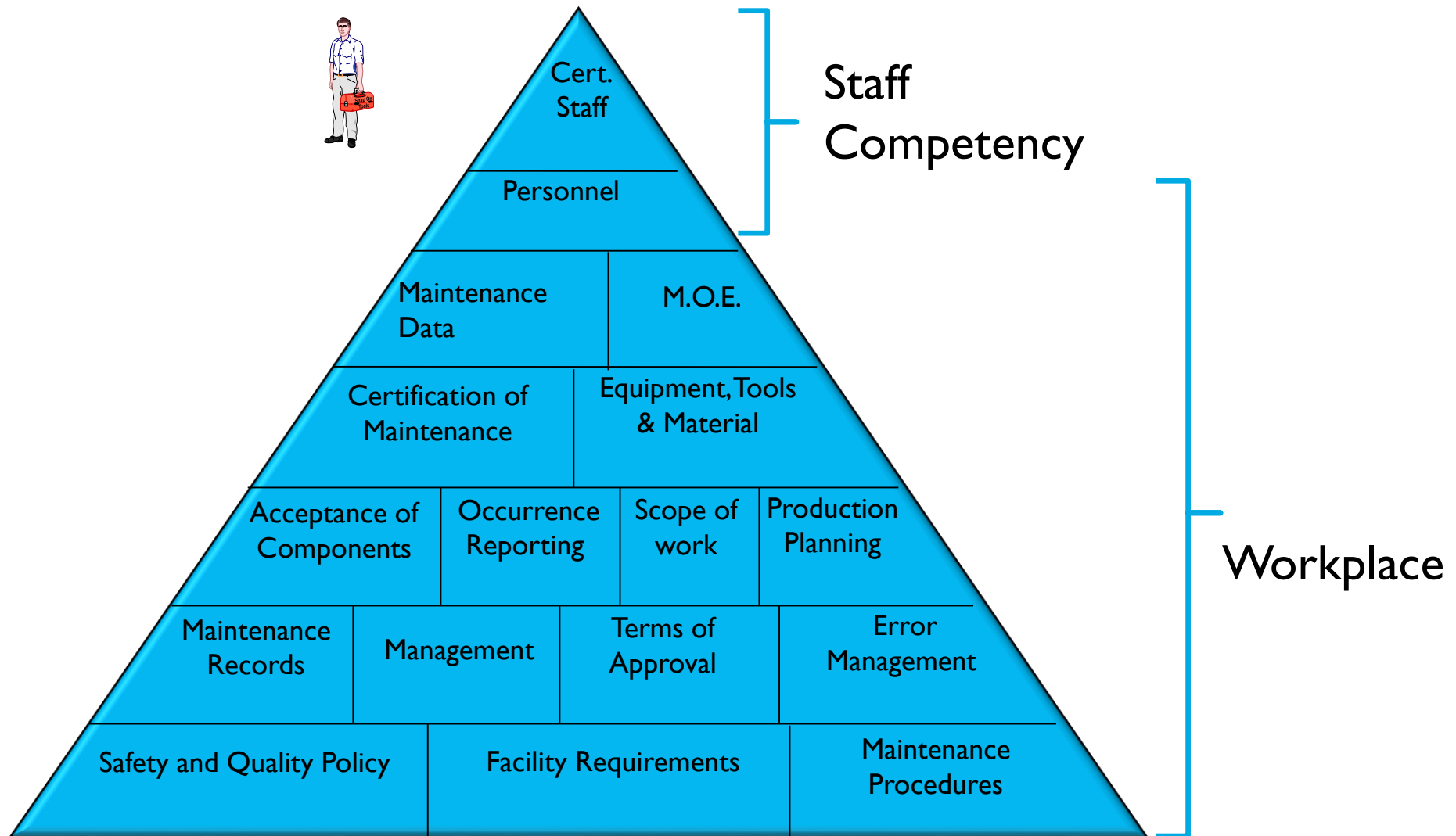
3 lines of defence



Maintenance Process and Practice Monitoring (MPPM)

- ▶ Observe day-to-day work behaviors during normal operations
- ▶ Discover procedural and systemic threats and errors
- ▶ Generate baseline data, implement new changes, and generate follow-up data to assess effectiveness
- ▶ Maintain Engineering Competences and Standards.

The I45 Maintenance System



MPPM scoring system



MPPM Scoring System

Score	Level	Work Environment Observation Description (sections 2-7)	Competency Review Observation Description (sections 1-10)	Reviewer action
N O	Not Observed	This aspect of the work environment was not observed during the review	This aspect of competence was not observed during the review	
1	Unacceptable	Poor conditions / resources / facilities / planning / oversight resulting in an unsafe, error-provoking, working environment	Observed performance has safety implications	Intervention is required to halt continuation of unsafe operation. Observation process should be terminated and only items observed prior to intervention should be recorded. The reviewer must provide a full explanation of the observed event in the review form. Submit a Ground Occurrence Report (GOR) or Ground Handling Report (GHR) as appropriate
2	Minimum Acceptable	Challenging conditions / resources / facilities / planning / oversight which if mismanaged would result in an unsafe working environment	Observed performance is barely adequate and is performed to minimum acceptable standards	
3	Satisfactory	Conditions / resources / facilities / planning / oversight present a safe working environment for employees with average experience	Observed performance is adequate and performed to the standard expected of the average employee based on their experience level	
4	Good	Good conditions / resources / facilities / planning / oversight that are error tolerant and result in safe working outcomes	Observed performance enhances safety as a direct result of the actions observed	
5	Excellent	Exemplary conditions / resources / facilities / planning / oversight that have been designed to be highly error tolerant and consistently ensure safe working outcomes	Observed performance is exemplary and mirrors an aspirational level of performance that all employees should be seeking to achieve	

Work Environment Review



Work Environment Review

SECTION	OBSERVATION AREAS
GENERAL (1)	Any general observations or concerns that do not fall under any of the sections covering standards or behaviours below
FACILITIES / ENVIRONMENT (2)	<ul style="list-style-type: none"> • Location / suitability / layout / ergonomics • Temperature / humidity / noise / vibration • Lighting • Housekeeping / cleanliness / tidiness • Racking and storage • Power sources (electrical / air / hydraulic) • Access equipment / docking and staging / support equipment / aircraft rigs / IT equipment • Labels / placards / signage • Distractions
EQUIPMENT AND TOOLING / PARTS / SAFETY EQUIPMENT (3)	<ul style="list-style-type: none"> • Equipment and tooling – availability / suitability / accessibility / calibration / labelling / reliability • Parts – availability / control / suitable packaging • Consumables / expendables – availability / ease of access / control • Safety equipment and PPE – availability / suitability / use
INFORMATION / MANUALS / MAINTENANCE DATA / WORK-CARDS (4)	<ul style="list-style-type: none"> • Accessibility • Adequacy • Correctness • Clarity • Easy to understand and follow • Unambiguous • Control and update process
PLANNING / SUPERVISION (5)	<ul style="list-style-type: none"> • Work planning and sequencing • Prioritization and organization of tasks • Leadership / supervision • Technical oversight / management of technical standards
JOB / TASK (6)	<ul style="list-style-type: none"> • Aircraft design / complexity / maintainability • Ergonomics • Task complexity / sequencing • Use of safety locks / isolation procedures / placarding of work areas (if appropriate)
ORGANISATIONAL FACTORS (7)	<ul style="list-style-type: none"> • Manpower • Workload • Commercial / operational pressures

MRM Skills Standard

Maintenance Resource Management (MRM) Skills Standard

Threat and Error Management (TEM) is the ability to anticipate and recognize threats and errors and manage them to a safe outcome by effective application of KSA and MRM skills

SITUATIONAL AWARENESS (SAW)

1. Is aware of what the aircraft and its systems are doing and how this interacts with the working environment
2. Looks out for his or her own safety as well as looking out for other team members
3. Identifies potential threats to safety and takes appropriate action
4. Takes action and advises others when aware that situational awareness is compromised

TEAMWORKING (TWK)

1. Actively promotes company values
2. Agrees, and is clear on, team objectives and member roles
3. Is friendly, enthusiastic and considerate of others
4. Uses initiative proactively, gives direction and takes responsibility
5. Is trustworthy and reliable in dealings with colleagues
6. Demonstrates respect and tolerance for others
7. Acts / speaks confidently and challenges responsibly with advocacy
8. Gives and receives praise and criticism well
9. Involves others in planning and tasks
10. Anticipates other staffs' needs and carries out instructions as directed
11. Willing to act as a mentor

COMMUNICATION (COM)

1. Knows when, what and with whom to communicate
2. Ensures recipient is ready and able to receive info
3. Passes messages clearly, accurately and completely
4. Checks receiver has correct understanding
5. Listens actively and shows understanding of info
6. Uses appropriate body language, eye contact and tone
7. Is open and receptive to other peoples' views
8. Challenges unsafe behaviour openly

PROBLEM SOLVING AND DECISION MAKING (PDM)

1. Seeks accurate and adequate information from good sources
2. Agrees essential and desirable outcomes and prioritizes
3. Considers all practicable options
4. Does not jump to conclusions or make assumptions
5. Makes decisions and evaluates
6. Perseveres in working through problems
7. Identifies and verifies why things went wrong
8. Considers risk but does not take unnecessary risk

TASK MANAGEMENT (TMT)

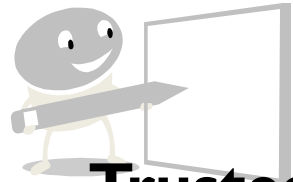
1. Plans and briefs thoroughly, ahead of time
2. Manages time available efficiently to complete tasks, prioritizing accordingly
3. Delegates as required
4. Offers, requests and accepts assistance when necessary in a timely manner
5. Communicates when external factors or the working environment may impact ability to perform job in a safe manner
6. Is aware of commercial pressure and avoids overloading self or others
7. Manages interruptions, distractions, variations and failures effectively
8. Always utilizes correct PPE
9. Does not allow "workarounds" to become the norm

KSA Standard

Maintenance Knowledge, Skills and Attitude (KSA) Standard

Threat and Error Management (TEM) is the ability to anticipate and recognize threats and errors and manage them to a safe outcome by effective application of KSA and MRM skills

KNOWLEDGE (KNW)	APPLICATION OF KNOWLEDGE AND PROCEDURES (AKP)
<ol style="list-style-type: none"> 1. Demonstrates practical knowledge of systems, their limitations and interdependencies 2. Has appropriate and thorough knowledge of working environment, relevant programs, processes and procedures 3. Has completed all necessary training and maintains currency by regularly accessing ITS learning 4. Knows where and from whom to source required information 5. Exhibits drive to improve personal levels of professional knowledge 6. Stays current with industry developments and new technologies 7. Shares knowledge and encourages others to learn 	<ol style="list-style-type: none"> 1. Understands how programs, processes and procedures relate to the job in hand 2. Follows processes and procedures appropriately and consistently 3. Demonstrates systematic and thorough troubleshooting methodology 4. Highlights any areas where approved maintenance data is ambiguous, incorrect or cannot be followed 5. Seeks continuous improvement in current processes and procedures 6. Reports occurrences and initiates processes for investigation 7. Admits mistakes made
TECHNICAL SKILLS (TCS)	OVERSIGHT OF SELF & OTHERS (OVS)
<ol style="list-style-type: none"> 1. Displays good hand skills with relevant technical expertise and prowess 2. Is effective in interpreting technical data 3. Demonstrates competence in the use of on-board aircraft systems and diagnostics 4. Chooses appropriate tooling and resources for the task in hand 5. Manages and controls, people, tools and equipment efficiently when carrying out tasks 6. Is proficient in the use of technical language and the writing of technical reports 	<ol style="list-style-type: none"> 1. Fully understands own role and responsibilities within the Safety Management System (SMS) 2. Takes time to PAUSE and REFLECT before and after allocation and conduct of activities 3. Reviews, monitors and cross checks actions conscientiously 4. Demonstrates effective oversight of the task and the work of others through: <ul style="list-style-type: none"> • Awareness of own and others' limitations • Assurance that all work is properly recorded and documented • Management and handover of complex tasks • Oversight of the work of unlicensed and contract staff • Diligent completion of independent / required inspections • Supervising other team members
	TECHNOLOGY (TNO)
	<ol style="list-style-type: none"> 1. Uses relevant maintenance and business systems effectively (e.g. SAP, IFS, ePubs, etc.) 2. Uses supporting IT equipment effectively 3. Uses relevant test equipment appropriately and effectively 4. Reports technology failures or weaknesses and makes suggestions for improvement 5. Highlights deficiencies with equipment / tools / safety equipment and identifies where these are inadequate or not suitable for the task



**Trusted
& Trained
Observers**



**SME/Sup within own team
Observations**



**Management &
Labour Agreement**



**Informed
Workforce**

MPPM Characteristics



**Non-
punitive**



**Targeted
Enhancements**



**Secure &
Private**



**Systematic
Observations**



Volunteers

- ▶ Promote MPPM
- ▶ Emphasise that MPPM is not for disciplinary purposes it for learning
- ▶ Select credible, respected observers
- ▶ Ask those being observed if it is OK to do the MPPM observation
- ▶ Communicate the MPPM results in a timely manner
- ▶ Use the information - create action plans, implement changes, and evaluate results.

What behaviour are we encouraging?



O.C.D

Observe the workplace

Clarify the threats present

Defend against them

What MPPM is not!

- ▶ An Audit
 - ▶ No checklists
 - ▶ No punitive occurrence reports
- ▶ An enforcement program
 - ▶ Not trying to catch people out
 - ▶ Not trying to find the bad guy
 - ▶ Aiming to improve safety by helping the observed and their peers.



Recap of the intent of MPPM



- ▶ To identify causal factors that encourage or necessitate procedures not to be followed, or to be unofficially adapted
- ▶ To assess the adequacy of available resources and procedures applicable to any given work process
- ▶ Understanding Shortcuts and 'Norms'
- ▶ To verify manufacturer's approved maintenance data and company procedures are viable, useable and followed
- ▶ To feed information into the continuous improvement process
- ▶ Assess Training Effectiveness.



Benefits of MPPM



- ▶ Assess Training Effectiveness
- ▶ Check quality & usability of procedures
- ▶ Identify and manage errors
- ▶ Assess safety margins
- ▶ Identify and manage threats
- ▶ Understanding shortcuts
- ▶ Involvement of employee groups
- ▶ Complements existing safety & QA programs
- ▶ Baseline for org. change
- ▶ Identify design problems.



Any questions?
