

# Operational Integrity of Contracted Equipment

Welcome and introduction

Kerry Gordon

Manager Assessment and Inspection

- NOPSEMA has recently conducted a number of inspections on MODU facilities where the inspectors sampled processes and procedures for safe management of contracted equipment.
- Significant safety risk gaps were found which resulted in enforcement action being taken against titleholders, MODU operators and third party equipment/service providers.

- Well testing is a complex and hazardous undertaking which typically includes bringing reservoir fluids (including hydrocarbons) onto the MODU facility where previously there were none.
- Well testing presents challenges in managing contractors that are using temporary equipment packages over relatively short work campaigns, and managing multiple interfaces between the different companies and organisations involved.

# Workshop Objectives

The workshop provides an opportunity for industry and NOPSEMA to collectively examine better ways to manage this significant risk.

- Provide information about the findings and lessons learned
- Communicate regulatory requirements and perspective
- Discuss opportunities for improvement
  - identify any responses on which immediate consensus can be reached
  - identify responses for which there is consensus in direction but require more work to define detail

- MODUs
- Well Test Equipment
- Interfaces
- Focus on Safety Case – not EP or WOMP
- Responses to unexpected conditions

- NOPSEMA inspection findings
- Information paper provided for context
- Consideration of existing standards and practices within participating organisations

## NOPSEMA will issue guidance on this matter:

- To address key issues identified and recognized in this workshop and in the information paper;
- To raise awareness and prompt a review of arrangements in place for the immediate and forthcoming campaigns; and
- ???

- Much higher confidence in collective ability to manage the risk through:
  - Clear understanding of roles and responsibilities;
  - Certainty in what needs to be done, how to do it, and confidence that everyone knows what to do
- A clear understanding of “game rules” for how to achieve these objectives with respect to sharing information and safety case involvement.



# ***NOPSEMA Inspection Findings***

**Rafael Flores**  
Perth, April 2018

- Planned Inspections (PI) Scope
- MODU Inspections - Findings (2016-2018 inspections)
- Inspection outcomes to industry stakeholders

# Planned Inspections - Scope

- Major Accident Events (MAE) & MAE Controls

- Loss of containment, loss of well control, loss of mooring, etc.
- Safety critical equipment (SCEs\*) and procedures.

- Themed Based Topics

- NOPSEMA Annual Operating Plan (AOP) :
  - 2015/2016: Contractor Management, Maintenance management.
  - 2016/2017: Maintenance

Management, MOC, Position Keeping Systems

- 2017/2018: Assets & Ageing Facilities, 3<sup>rd</sup> Party Equipment and Services, Safety Assurance.

- OHS Topics

- Noise & Vibration, Medical Services, etc.

- Incident/Accident Follow Up

\*SCE is any equipment, structure or system whose failure could cause or contribute to a major accident event (MAE), or whose purpose is to prevent or mitigate the effect of a MAE – Examples include emergency shut down valves (ESDV), pressure safety valves (PSV).

- Maintenance Management
- 3<sup>rd</sup> Party Equipment & Services
  - Well Test Equipment as main focus area
  - Mud processing and cementing equipment have been also been inspected.
- Safety Assurance
  - SIF assurance – process safety
  - Audit and broader safety assurance
    - Avenue to assess Safety Case / Permission Documents compliance in areas such as:
      - Job planning and risk management, reporting and auditing among others.

# MODU Inspections - Findings

- Ensco MS-1 (ex-Atwood Osprey) (PI 1386) – September 2016
  - **“Maintenance Management”** - *Well test or clean up equipment*
    - Recommendations related to 3<sup>rd</sup> party well test equipment (SLB):
      - ✓ Address shortfalls on pressure vessels major (5 yearly) re-certification compliance with standards (e.g. DNV-RP-E101) and (as stated) in relevant company standards/ procedures;
      - ✓ Strengthen procedures to ensure equipment is not utilised / mobilised until standards met; and
      - ✓ Safety Integrity Level (SIL) assessment for instrumented functions (e.g. ESD).

- Ocean Monarch(PI 1477) – November 2016
  - “**Loss of Containment - MAE**” - Well test operations
    - Recommendation related to 3<sup>rd</sup> party well test equipment (SLB):
      - ✓ Shortfalls on pressure vessels major (5 yearly) re-certification compliance with standards (e.g. DNV-RP-E101) and (as stated) relevant company standards/ procedures (same finding as PI 1386).
    - Recommendations related to fixed well test equipment (Facility Operator):
      - ✓ Fixed well test manifold condition (i.e Corrosion); and
      - ✓ PM system lacking maintenance routines for the facility fixed well test equipment.



- Ocean Apex (PI 1478) – January 2017
  - **“Loss of Containment - MAE”** - Well test operations
    - Recommendation related to 3<sup>rd</sup> party Well Test equipment (SLB) for facility operator to action:
      - ✓ Auditing of well test control measures in line with safety case commitments & facility operator SMS (Control of third party equipment & pre-activity checks).
    - Recommendations related to fixed well test equipment (Facility Operator):
      - ✓ Fixed well test lines serviceability and documentation (e.g outdated drawings for well test lines); and
      - ✓ PM system lacking maintenance routines for the facility fixed well test equipment.

- Ensco 5006 (PI 1496) – February/March 2017
  - **“Loss of Containment - MAE”** - Well test operations
    - Recommendations related well test equipment for facility operator to action:
      - ✓ Well test equipment performance standards alignment with safety case;
      - ✓ Follow up and close out of actions in recommendation register (Well test HAZID/FSA); and
      - ✓ HAE compliance and records.
    - Recommendation related to 3<sup>rd</sup> party Well Test equipment (EXPRO):
      - ✓ Safety Integrity Level (SIL) assessment for instrumented functions (e.g. ESD).

- Ensco MS-1 (PI 1491) – March 2017
  - “**Maintenance Management**” - Well test or clean up equipment
    - Findings related to 3rd party well test equipment leading to enforcement (1 x PN and 3 x INs) involving the key stakeholders (Atwood, Conoco Phillips and Halliburton):
      - ✓ Significant certification shortfalls found for the following equipment:
        - ❑ 1440 psi 3 Phase Separator Skid
        - ❑ 10K Steam Heat Exchanger
    - Recommendation related to 3<sup>rd</sup> party well test equipment:
      - ✓ Safety Integrity Level (SIL) assessment for instrumented functions (e.g. ESD).
    - Halliburton & Conoco Phillips follow up inspections (see slide on page 18).

- Ocean Apex(PI 1574) – July 2017
  - “**Loss of Containment - MAE**” - Well test operations (Landing String/Compensator Failure)
    - Recommendation related well test operations for action by facility operator:
      - ✓ Review of DSC lock up / pressure loss procedures prior well test operations commencing.
    - Recommendation related to 3<sup>rd</sup> party Well Test equipment (EXPRO) for title holder to action:
      - ✓ Quality assurance process completeness – documentation endorsement (certifying authority); and
      - ✓ Adequate MOC for deviations.

- Ensco MS-1 (PI 1582) – September 2017
  - **“3<sup>rd</sup> Party Equipment and Services”** – Permanently installed equipment (Cementing unit, Mud and Solids Processing Equipment)
    - Recommendation related mud and solids processing equipment for action by facility operator:
      - ✓ Planned maintenance and relevant certificates to be kept in operator’s system.
    - Recommendations related to mud and Solids processing equipment for 3<sup>rd</sup> party equipment provider (Halliburton) to action:
      - ✓ Relevant maintenance documentation; and
      - ✓ Certification inclusive of Ex rated equipment to be readily available.

- Noble Tom Prosser (PI 1646) – October 2017
  - **“3<sup>rd</sup> Party Equipment and Services”**
    - Recommendation related to control of third party equipment for action by facility operator:
      - ✓ Strengthen TPE inspection and acceptance process to provide a level of assurance equivalent to the process depicted within the facility safety case.

- Ocean Monarch(PI 1647) – October/November 2017
  - “3<sup>rd</sup> Party Equipment and Services”
    - Findings related to 3rd party well test equipment leading to enforcement (2 x INs & 1 x General Direction\*) involving the key stakeholders (Diamond, BHPB and Expro):
      - ✓ resulting from non-conformities related to inadequate maintenance and QA/QC of EXPRO provided equipment:
        - Surge tank STE-TNK-016
        - Surface Safety Valve (SSV) IO9985-2
        - ESD Panel
        - Coflexip Hose
        - HP Pipe work
    - Expro follow up inspection (see slide on page 18).

## – “Safety Assurance”

- Findings related to campaign specific abandonment activities leading to recommendations and enforcement (3 x INs & 1 x General Direction\*, 2 x Warning Letters) involving the key stakeholders (Diamond, BHPB and Expro):
  - ✓ Enforcement actions resulting from non-conformities related to safety assurance and risk management to:
    - ❑ strengthen process and procedures relating to risk management, risk communication and stop work directives;
    - ❑ strengthen process and procedures relating to facility’s technical modifications and the respective Management of Change (MOC) process;
    - ❑ indicate non-compliance with requirements of Regulation 2.30 of the OPGGS(S) (revision of safety case) and;
    - ❑ indicate non-compliance with requirements of Clause 82 of Schedule 3 to the OPGGS Act and regulation 2.42 of the OPGGS(S) regulations in relation to notification and reporting of accidents and dangerous occurrences



- Ensco DPS-1 (PI 1582) – February 2018
  - **“3<sup>rd</sup> Party Equipment and Services”**
    - Recommendation related to control of third party equipment for action by facility operator:
      - ✓ Implementation of corporate documentation (SMS) for control of TPE; and
      - ✓ Auditing of TPE maintenance.

- Business premises inspections (under warrant) resulting from offshore PI findings & enforcement:
  - Halliburton (April 2017) (ID 1600) – (from PI 1491).
  - Conoco Phillips (June 2017) (ID 1627) – (from PI 1491).
  - EXPRO (January 2018) (ID 1725) – (From PI 1647).

# Inspection outcomes

- Recommendations
- Enforcement
  - Prohibition Notice
  - General Direction
  - Improvement Notices
  - Warning Letters
- Industry / Stakeholder engagement
  - Drillsafe Presentations (April 2017 & March 2018)
  - Operational Integrity of Contracted Equipment Workshop

# Operational Integrity of Contracted Equipment

Regulatory Requirements and Perspective

Kerry Gordon

Manager Assessment and Inspection

- The operator is the person who has day-to-day management and control of the facility and therefore has the key role in the safety case regime with fundamental duties.
- The safety case for a facility must reflect how the operator has addressed these duties.

- In relation to parts of the work being conducted, such as well testing, the titleholder often has duties for the well testing activities being carried out under OPGGSA as *‘persons in control of parts of facility or particular work’*
- Well testing service providers have duties regarding the safety and integrity of the plant and equipment they supply and associated duties as a *‘supplier of plant and substances’*

- There is no doubt that all specified parties have duties under the Act. You all have obligations to keep your people safe.
- All parties need to be properly informed:
  - What do you need to provide to others?
  - What do you need to have provided to you?



# Name the elephant in the room



- The titleholder has contracted the drill rig and the equipment/service provider, and sets the work plan and objectives
- The rig operator cannot abrogate responsibility under the safety case.

There is a fundamental tension in this construct.

- While each stakeholder has individual duties under the legislation, no one has sole responsibility for OHS during well testing.
- Understand how your responsibilities relate to other party responsibilities: Does everyone understand their role in stopping it going wrong?
- Inability to get this right has far reaching implications: Be ever vigilant for situations which could jeopardise industry's licence to operate.



# Safety Case Revision

- The safety case is produced in the knowledge that it will be scrutinised by a competent and independent regulator
  - Responsibility for safety case revision will always remain with the facility operator, however it is typically developed by the titleholder or a specialist consultant.
  - Onus is on all parties, including equipment/service providers, to ensure that the correct information is provided in the safety case.
  - NOPSEMA assesses safety cases and '**accepts**' a safety case if it is satisfied that the arrangements set out in the document demonstrate that the risks will be reduced to as low as is reasonably practicable (ALARP).

Regulatory requirement for workforce involvement:

- An understanding is developed of the hazards and risks, and informed decisions are made concerning the control measures and safety management systems implemented to control these risks.
- Members of the workforce who have an active role in implementing the controls and safety management systems are also better aware of their own responsibilities

- In situations where responsibility for health and safety is shared, involvement of the workforce can help address any gaps in managing risks that often occur when:
  - there is a lack of understanding of how the activities of each person may add to the hazards and risks to which others may be exposed;
  - different duty holders assume that someone else is taking care of the health and safety matter.

- Effective workforce involvement requires careful consideration of:
  - the reasons for workforce involvement;
  - who should be involved;
  - the timing and duration of involvement;
  - the subject matter;
  - where the involvement should take place; and
  - how the workforce should be involved.
- Effective workforce involvement requires the commitment, cooperation and competence of all parties involved



# NOPSEMA Workshop

Operational integrity of offshore contracted equipment

Design & Planning

April 11, 2018



# Design & Planning

- Wells Management System (WMS)
  - Compliments the ConocoPhillips Global Wells Standards and Practices
  - Outlines the requirements business units must meet to provide a consistent framework and approach to ensure wells are designed, constructed, operated, maintained and abandoned such that risks of uncontrolled flow is ALARP.
  - The system is applicable to all wells from design to final abandonment outlined in 16 Elements
- Well Design and Delivery Process (WDDP)
  - Process enables the safe, efficient, and effective planning and delivery of wells across ConocoPhillips via a structured process.
  - Establishes the minimum deliverables and actions required for all ConocoPhillips operated wells.
  - Well construction data, risks and mitigations are captured via MaxBook and stored in appropriate locations within the MaxWell database.
  - Risks and Mitigations are conveyed to the workforce via approved well procedures and documentation (drilling well plan, workover plan, bridging documents, SIMOP's plans, approved MaxBook etc.)
  - QA/QC is an integral part of the ConocoPhillips Well Design and Delivery Process which includes Scoping and Tendering of Services
- Quality Management Plan (QMP)
  - Well Operations QMP is designed to define the necessary controls to ensure that equipment supplied to a Mobile Offshore Drilling Unit (MODU) for drilling, completion, work-over, abandonment and well intervention operations are properly managed.
  - The specific QA/QC requirements start during long lead contracting activities in the Select and Define stage and mature through Execute and Operate.

# Wells Management System

- 16 Elements
  - Compliments the global and business unit standards, practices, processes and systems used to maintain compliance with all standards and regulations.
  - Each element outlines the requirements for a consistent framework designed to reduce risk to ALARP
  - Describes compliance with Corporate HSE Management Standards
  - Details responsibilities
    - Element 1: Policy and Leadership
    - Element 2: Risk Assessment
    - Element 3: Legal Requirements and Standards of Operations
    - Element 4: Programs and Procedures
    - Element 5: Basis of Design and Well Design Envelope
    - Element 6: Management of Change
    - Element 7: Emergency Preparedness
    - Element 8: Rig and Equipment
    - Element 9: Well Integrity Program
    - Element 10: Company Personnel – Awareness, Training and Competency Requirements
    - Element 11: Contractor Personnel - Awareness, Training and Competency Requirements
    - Element 12: Roles and Responsibilities
    - Element 13: Communications
    - Element 14: Well Handover
    - Element 15: Audits
    - Element 16: Wells Management Review



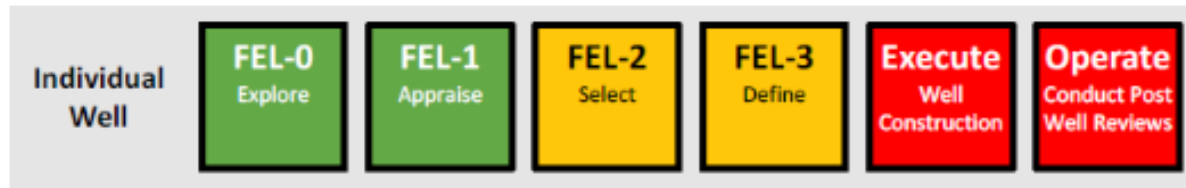
**Wells Management System**

**Australia Business Unit - West**

**Document No: ALL/DR/STD/017  
Rev 0**

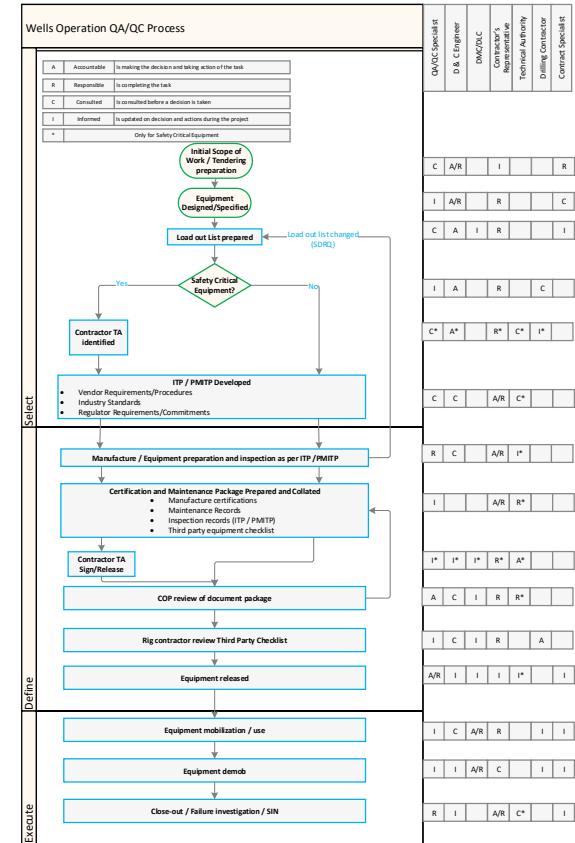
# Well Design and Delivery Process - MaxBook

- The ABU-W Well Operations Department executes its well operations using the Well Design and Delivery Process (WDDP).
  - The WDDP is a stage gated process to assure the safe design and delivery of wells
  - Structured process using organized multi-disciplined expertise and continuous improvement
  - Establishes minimum global requirements for all ConocoPhillips operated wells
  - Outlines responsibilities
  - Includes a linear approval process aligned with authority limitations
  - Details critical well reviews and decision review boards
- MaxBook, a web-based tool to support, organize and document the WDDP.
- Maxwell, a shared file structure to categorize and store supporting documents



# Quality Management Plan

- Defines the Controls for Well Ops QA/QC Process
  - Detailed responsibilities and workflow is defined
  - Flow chart and RACI is described in detail
  - Starts with scope of work definition
  - Integral to tendering and evaluation for award
  - Details the implementation tools:
    - Inspection test plan (ITP)
    - Preventive Maintenance Inspection Test Plan (PMITP)
    - RACI outlines responsibilities
- Linked to logistics plan
- Includes a release certificate from TA
- Includes full documentation package
- Includes requirement for Third Party Checklist
- linked to the audit section of WMS



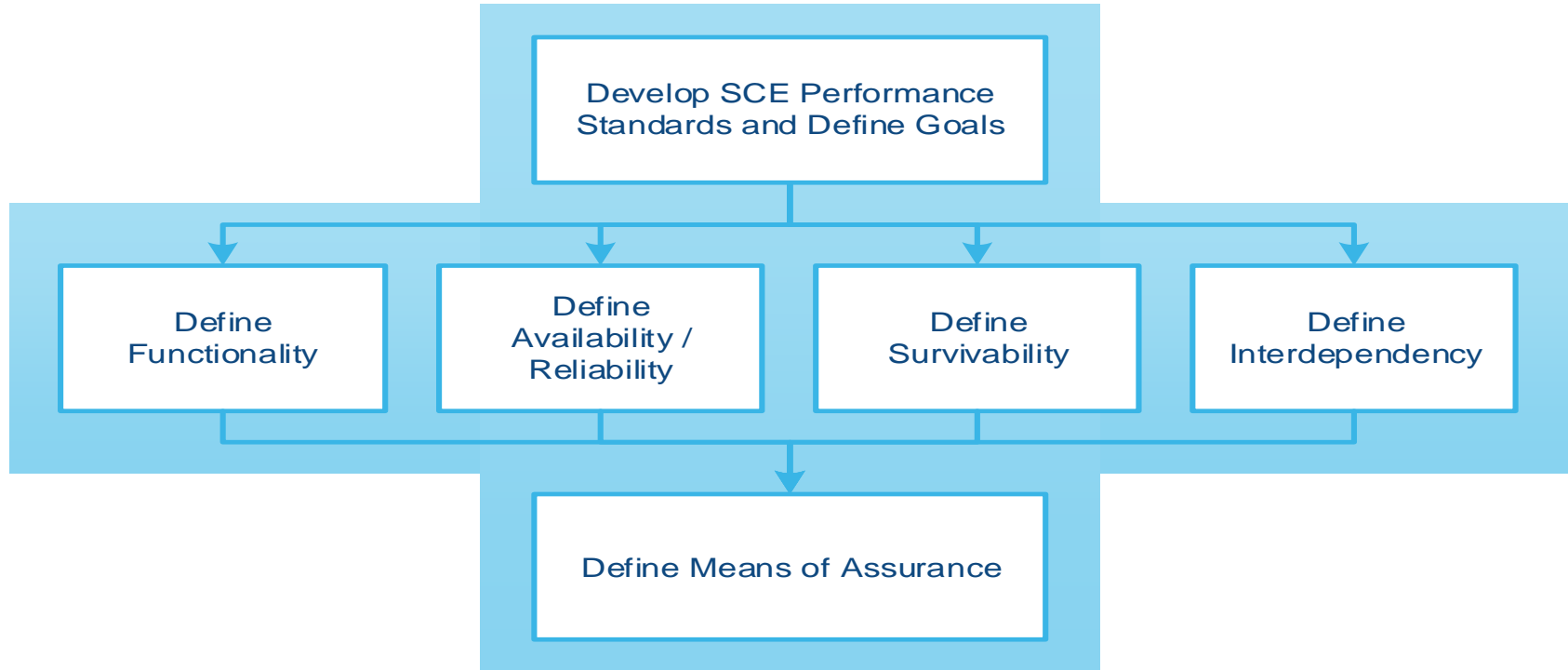


# Compliance with Performance Standards



*GoBeyond*

Confidential





# Sample Performance Requirement and Means of Assurance Criteria

Functionality						
Performance Requirement			Means of Assurance			Basis
ID	Key Requirement	Performance Criteria	Assurance Activity	Responsible Party	Frequency	
E5006-PS-19-F3B	TEMSPC shall be capable of self-propulsion following launch.	<p>TEMPSC shall have two independent starting mechanisms.</p> <p>Engine shall start within two minutes in all climatic conditions.</p> <p>Engine accessories shall be enclosed in a fire retardant casing.</p>	Equipment function test	Class society	Annual	IMO LSA Code





# 3rd Party Pre Mobilization Checklist- Australia

Management of Third Party Equipment Procedure- Australia

3rd Party Pre Mobilization Checklist- Australia



## THIRD PARTY EQUIPMENT PREMOBILIZATION CHECKLIST (AUSTRALIA SPECIFIC)

*Operations Manager*

FM-MEAAP-RAC-833a

02-Feb-18

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Section 'A' - Equipment & Installation Details (To Be Completed by Vendor before the equipment is sent to the rig)		
Rig / Facility:	Inspection Date:	Inspection Type: New <input type="checkbox"/> Re-inspection <input type="checkbox"/>
3 <sup>rd</sup> Party Company:	Address:	Contact Name & Numbers:
Serial Number:	Model:	Manufacturer:
Description:		Gross Weight:

# Planning for Change

**Joelle Mitchell**

Workshop - Operational Integrity of Contracted Equipment

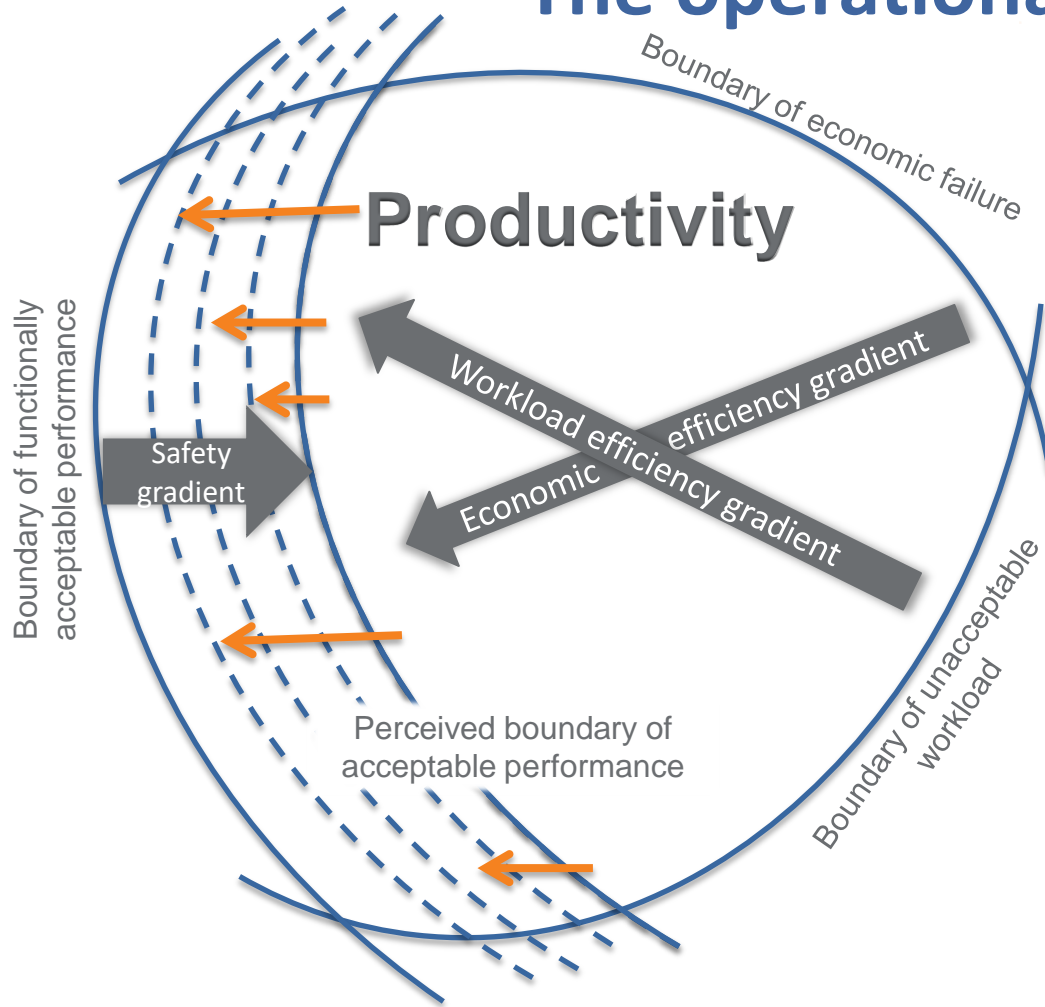
5<sup>th</sup> April 2018

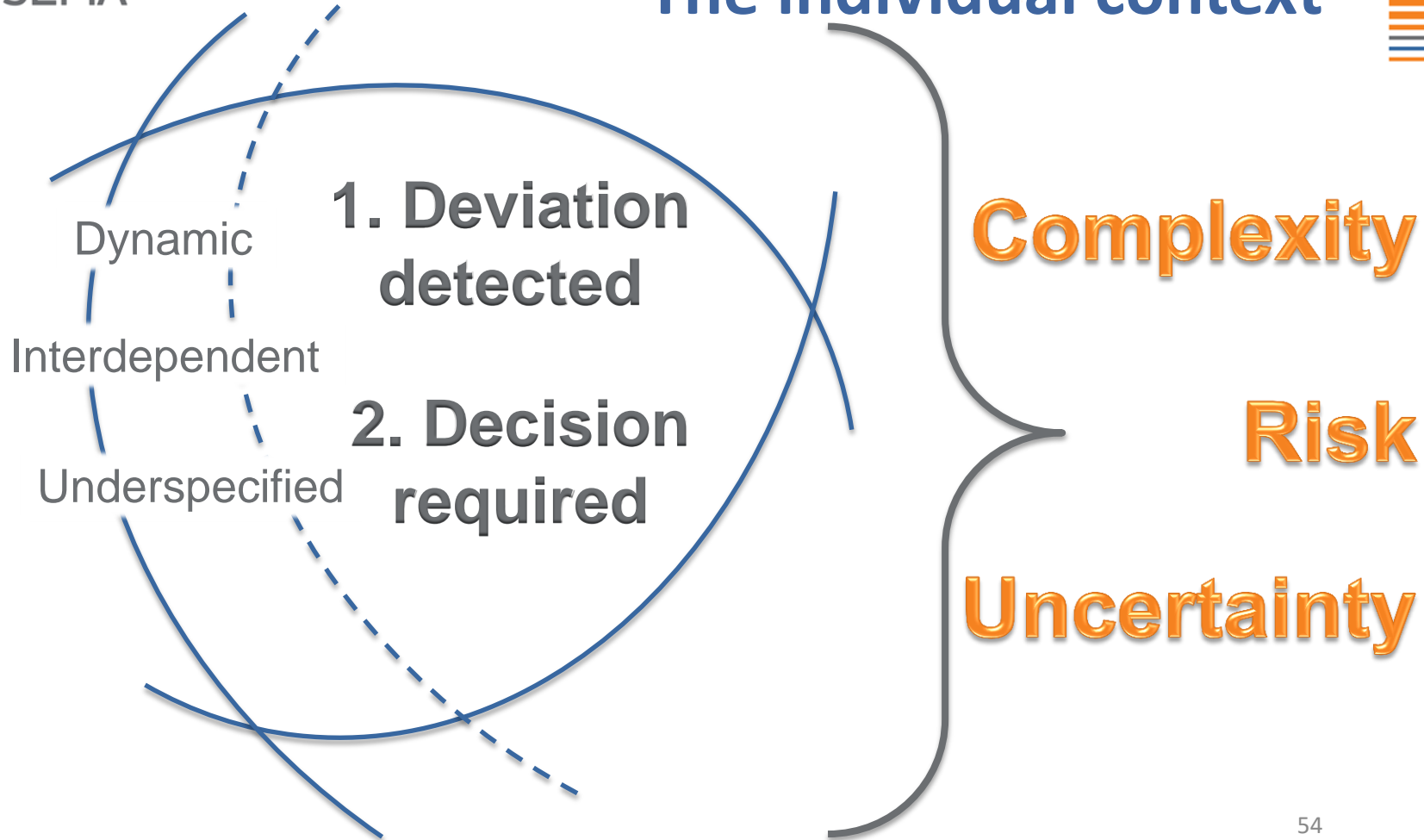
- The “macro-micro connection”
  - Global commercial context
  - Operational context
  - Individual context

# Competition



# Scarcity





- Contingency planning
- Defining boundaries
- Learning to cope at the boundaries