



SAAMA2019
CONFERENCE

SAAMA Risk-Based Inspection Technical Committee Workshop

Lize Brink

14 May 2019

14-16 MAY 2019 | SPIER WINE FARM | STELLENBOSCH

Why are we here?

With the publication of the OHS Act, 1993 (Act no. 85 of 1993) Pressure Equipment Regulation (PER) in October 2009...

conditions were supplied to ensure pressure equipment vessel integrity

HOW?

3 yearly inspections per annum 1 of the regulation

RBI Management System as per section 12 of the regulation

Why are we here?

- RBI Technical Committee under SAAMA created in October 2018

Technical Committee Chair: Dr Shanil Narain Singh

- 4 work streams:

- *Education, Training and Development – Prof Johann Wannenberg*
- *RBI definition and **Rule Book** – Lize Brink*
- *The value of adopting RBI (Business Case) – Ria Furriel*
- *Best practice and experience in RBI implementation – Sipho Mkhabela*



RBI working committee: RBI definition and Rule book

- Develop guidance documents to assist industry in:
 - Understanding what RBI is
 - How it fits in with asset management
 - It's benefits and limitations
 - Guidance on where to start if you would like to implement an RBI system



Current status

Draft RBI rule book developed, which covers the following sections:

1. INTRODUCTION

- Background of RBI
- Regulations (PER) – Context within SA
- Why RBI?
- Benefits
- Applications – Pressure Vessels and Piping
- Purpose – equipment covered

2. TYPES OF RBI ASSESSMENTS

- RBI Approaches
- Risk Evaluations



Current status

3. LEGAL REQUIREMENTS

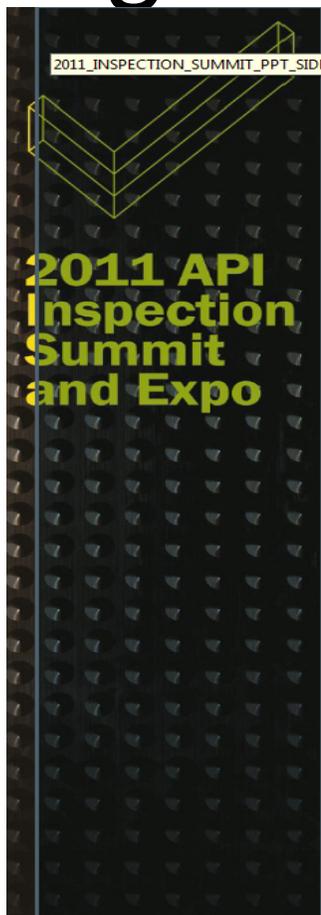
- Accreditation and Certification Road Map
- Approved Health and Safety Standards
- Accredited Certification Bodies
- RBI Management System

4. THE PROCESS- HOW TO CONDUCT AN RBI STUDY

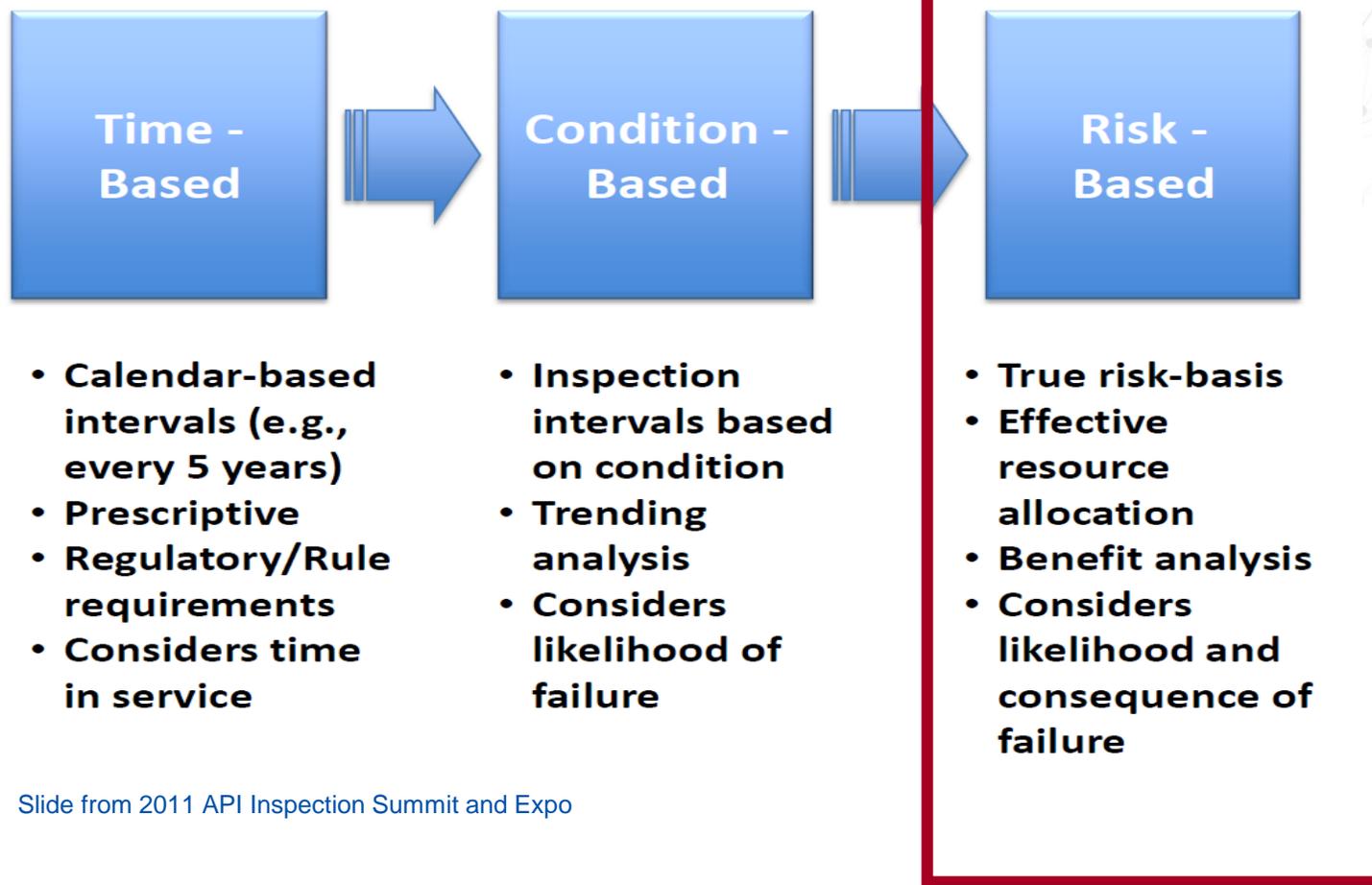
- Planning and Objectives of RBI
- Data and information collection and validation
- Risk analysis
- Test and inspection plan
- RBI Pitfalls



Background of RBI



Shifting to Risk-Based Inspection



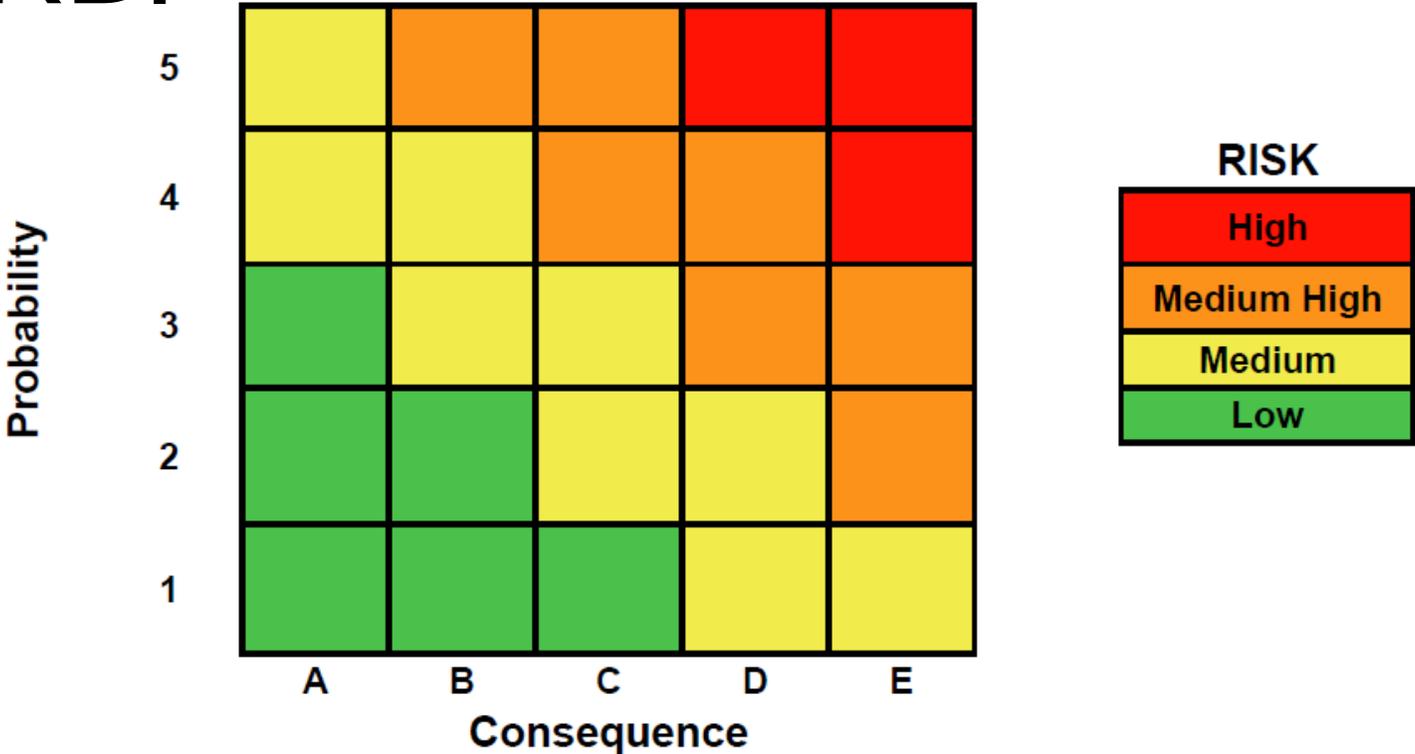
Slide from 2011 API Inspection Summit and Expo



Background of RBI

Probability of failure:

Likelihood of an equipment or component failure due to single damage mechanism or multiple damage mechanisms occurring under specific operating conditions.



Consequence of failure:

The outcome of a failure event used in relative ranking of equipment, it can be determined for safety, environmental and financial events.



Regulations (PER) – Context within SA

- Users who wish to implement a risk-based inspection management system need to apply to the DoL prior to implementation of such system. Such application shall include proof that the user has applied to a certification body for accreditation.
- The following documentation shall be prepared as a minimum by the user for the application to implement RBI to the DoL:
 - File of the RBI management programme
 - The (Chief) RBI specialist and his/her qualifications;
 - List of all your RBI Team personnel and list of their competencies and qualifications;
 - Health and Safety standards to be used;
 - Certification Body involved;
 - AIA Manufacturing involved in the approval;
 - Letter of recommendation from the AIA manufacturing to implement RBI; and
 - Target date of certification of RBI management system.
- The scope of application of the RBI quality system is determined by the user on an individual equipment basis.



Why RBI?

- Assets that pose a greater risk are maintained and monitored more frequently while assets that carry a lower risk are subjected to less strict maintenance monitoring. A prescriptive approach is no more fitted:
 - Over /under inspection of equipment, inspection frequency not adapted to risk level.
 - Revamping, production pressure (less incident, more availability, high throughput).
 - Adjust major shutdowns (extend and duration) to risk level.
 - Increase intervals between major shutdowns keeping the risk level acceptable (more intermediate non-intrusive inspection, less inspection on low risk equipment etc.).



RBI approaches

The quantitative approach

- A highly data driven methodology that is focused upon theoretical corrosion rates. The assessment calculates the remaining safe operating life of the equipment and the output is typically in numerical form. With this approach sensitivity analysis becomes more important, with high level of detail and precision.

The qualitative approach

- A more holistic view to determine what to inspect, where, how and when. It identifies the actual operating and maintenance conditions for the assessed equipment. Based on engineering judgment and experience, this approach requires a higher level of skill and understanding. Inputs are given in data ranges instead of discrete values. It is an effective, generally conservative screening tool.

The semi-quantitative approach

- Semi-quantitative is a term that describes any approach that has aspects derived from both the qualitative and quantitative approaches. It is geared to obtain the major benefits of the previous two approaches (e.g. speed of the qualitative and rigor of the quantitative).



Risk evaluation

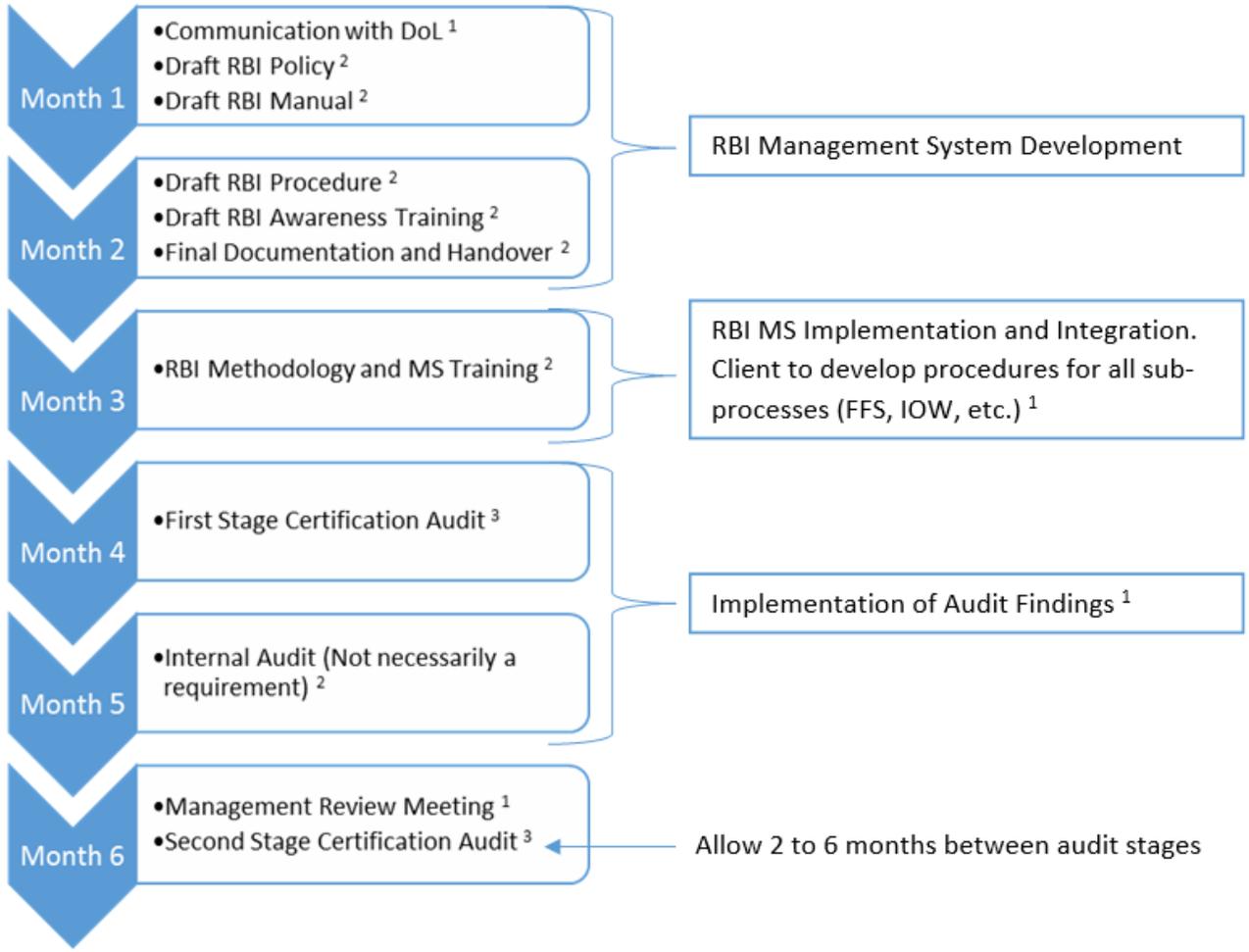
It is essential for an organization to define **acceptable risk levels** and ensure the compliance to the relevant standards and policies.

- **Risk appetite** is the amount and type of risk an organization is willing to accept in pursuit of its business objectives.
- **Risk tolerance** is the maximum risk that an organization is willing to take regarding each relevant risk.
- **Risk threshold** is the threshold to monitor that actual risk exposure does not deviate significantly from the risk target and stays within an organization's risk tolerance and risk appetite.



Accreditation and Certification Road Map

Typical RBI Certification and Assessment Program



Accredited Certification Bodies

SANAS's responsibility is to perform technical competence assessment of the Certification Bodies.

List of Certification Bodies					
<u>Facility No</u>	<u>Name</u>	<u>Location (City)</u>	<u>Province</u>	<u>Status</u>	<u>Scope of Accreditation</u>
C72	Bureau Veritas South Africa (Pty) Ltd	Johannesburg	Gauteng	Accredited	Risk Based Inspection Management System
C09b	TUV Rheinland Inspection Services (Pty) Ltd t/a TUV Africa	Centurion	Gauteng	Accredited	Risk Based Inspection API 580 & RIMAP

Source: www.sanas.co.za



Questions?

What else would you like to see?

Are we addressing the correct points?

What else would you like to see to assist you?

