CONSULTANCY SERVICE FOR RISK BESED INSPECTION (RBI) AND SOFTWARE IMPLEMENTATION

REQUIREMENT

Consultancy service for Risk Based Inspection (RBI) and software implementation is performed for the study a comprehensive inspection and maintenance plan based on risk approach for the smooth running and operation of this facility on equipment and piping performed for Erawan Riser Platform (ERP) and PTT Riser Platform (PRP) of PTT Public Company Limited (PTT)

OBJECTIVES

The scope covers :
- RBI covers only the topside facilities (piping and pressurized equipment) in the platform.
- RBI study to assess the risk profile and prioritize the equipment and piping for risk mitigation (e.g. by inspection)
- RBI software implementation
- RBI training

RBI METHODOLOGY

The RBI study will evaluate the risk for each piece of equipment and piping based on the probability of failure of the pressure boundary of the equipment and piping that could result in a leak and hence causing safety and financial consequences.

Risk is calculated for each component by multiplying the probability of failure (PoF) and the consequence of failure (CoF). The risk limit has been specified and mutually agreed for safety and economic aspects. The inspection target date is suggested and optimized based on the calculated risk; the inspection date will be shortened if the risk limit is exceeded.

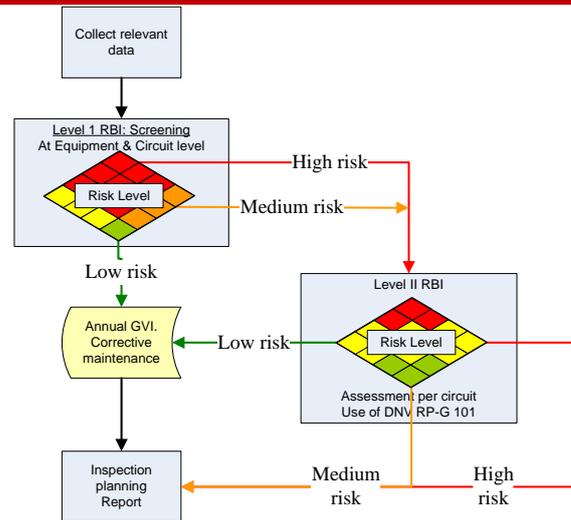Figure 1 presents an overview of the working process in the form of a flow chart

Figure 1 Overview of risk assessment working process

The methodology follows API 580/581 and consultancy's the procedure as DNV RP-G101 (Recommended Practice for Risk Based Inspection of Topside Static Mechanical Equipment) is used to calculate the risk due to corrosion, erosion and cracking for pressure equipment in a marine environment supported by ORBIT™ Offshore software will be applied in the RBI analysis.

RBI analysis for two platforms are performed to follow in a diagram in figure 2 and a two stages process as "Screening Analysis" and "Detailed Assessment" in figure 3
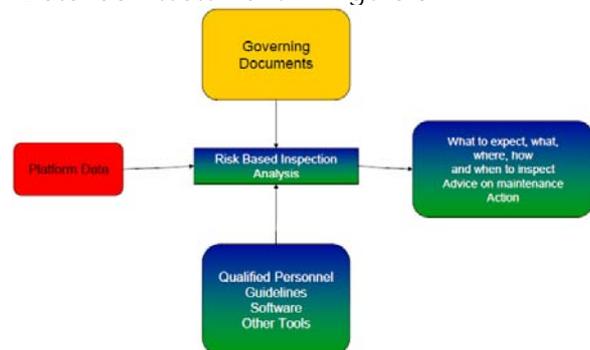

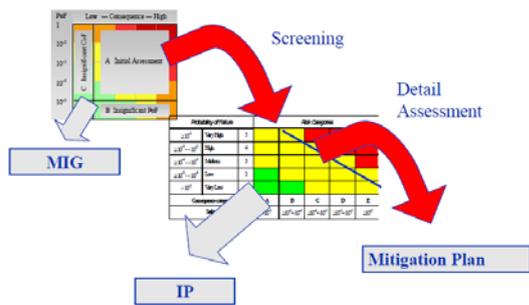**Figure 2 RBI analysis diagram for platform**

Figure 3 Two stage process

Stage 1 – Screening analysis

Philosophy
- The aim of screening is to focus further attention on high-risk systems on the installation
- The reduces the effort required in data gathering and evaluation
- Low risk systems are not forgotten; the basis for risk ranking should be re-evaluated regularly to ensure continued validity
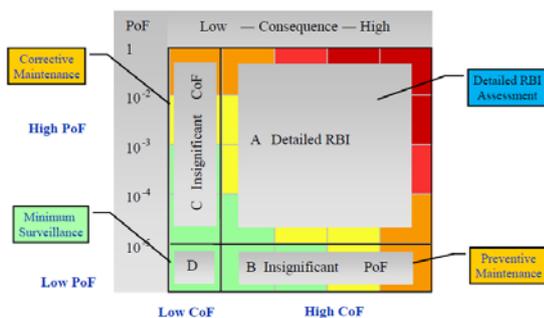

Figure 4 Screening matrix

Results
- Typically 30-50% of equipment and piping "screened out"
- Remaining equipment and piping for Detailed analysis

Stage 2 – Detailed Assessment

Philosophy
- Address the equipment/piping given as "high" Risk in Screening analysis
- Prepare a detailed inspection plan for all these equipment/piping

Results
- CoF modeling
- PoF modelling
- Risk matrix
- Inspection planning

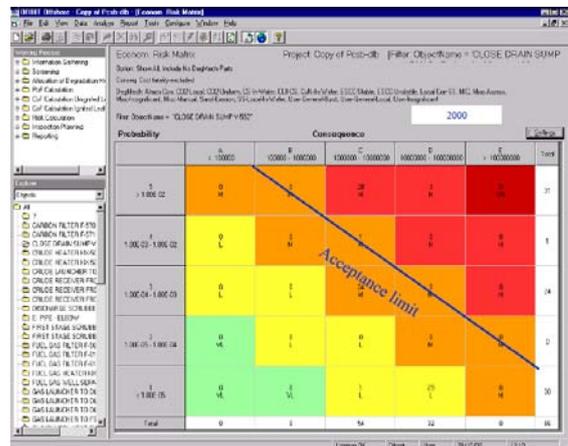Risk matrix can be presented in a matrix that is a combination of PoF and CoF

Figure 5 Risk matrix PoF example from ORBIT™ Offshore

Pims Technologies and alliance consultancy partner and technologies provider DNV based team performed data collection, development of corrosion loops/segmentations, offshore site survey, risk analysis (screening analysis and detailed assessment), risk ranking and inspection planning including overall risk summaries as well as detailed inspection planning reports to view the big picture, looking at risk reduction and cost benefit analysis.

The benefits of this include :
- Reduce costs through effective inspection
- Focus on "Acceptable Risk" levels
- Identify major contributors to risk
- Determine inspection priorities
- Optimize inspection regimes
- Evaluate plans for future inspection
- Integrate with inspection management system
- Merge data from external Quantitative Risk Assessments into analysis

System:	Communication:	Application:
Geographic Information System	Multiplexer	Geospatial data
Integrity Management System	LAN	High consequence analysis
Consultancy Services	WAN	Inline inspection analysis
Network Simulation		Risk analysis
Telecommunication System		Rehabilitation
		XML
		Risk Based Inspection