

## Project Profile

**Trihasco Utama**  
Inspection and Engineering company

**Giving  
Value  
Asset  
Safety**  
*Added for Your*



**Trihasco Utama**  
Inspection and Engineering company

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Please contact PT. Trihasco Utama if you would like to know more about the services outlined Brochure

**“RBI (Risk Based Inspection)  
For Onshore Plant ”**



# “RBI (Risk Based Inspection) For Onshore Plant ”

RBI (*Risk-Based Inspection*) method represents the next generation of inspection approaches and interval setting, recognizing that the ultimate goal of inspection is the safety and reliability of operating facilities. RBI, as a risk-based approach, focuses attention specifically on the equipment and associated deterioration mechanisms which represent the most risk to the facility.

As the part of the ongoing technical services of RBI (*Risk Based Inspection*) study for our Client, PT Trihasco Utama in cooperation with TWI Ltd have performed a RBI assessment of piping and pressure vessels located at Sumatera

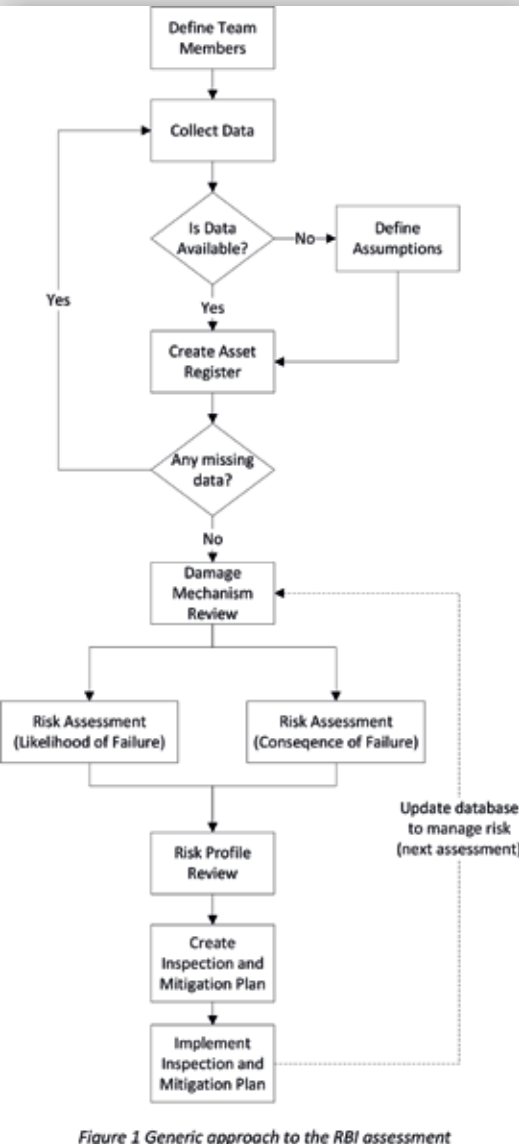
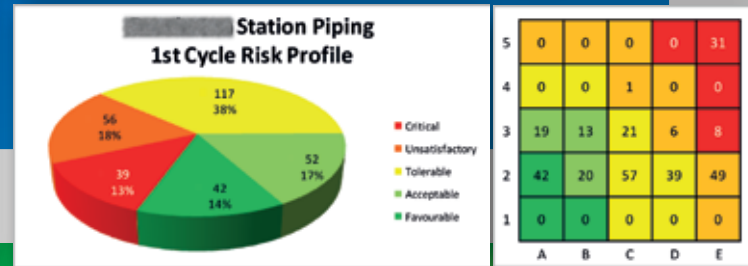
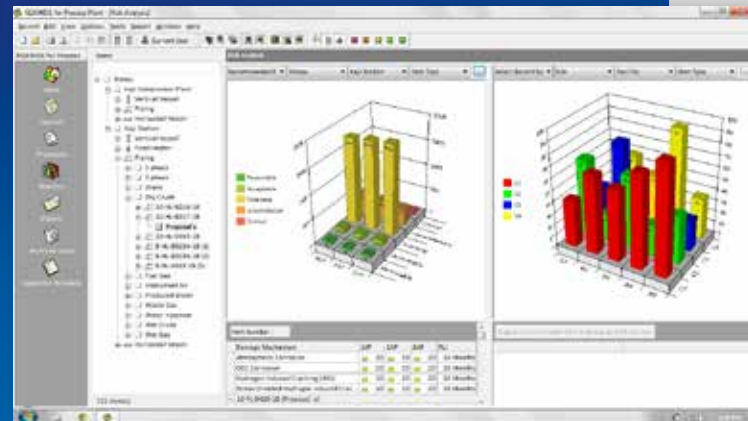


Figure 1 Generic approach to the RBI assessment

Fluid Service	Damage Mechanisms										
	Mechanical Mechanisms		Internal Uniform or Localized Metal Loss				Environmental Assisted Cracking (EAC)		Non API 572		External Metal Loss
	Erosion Corrosion	Vibration Induced Fatigue	Galvanic	CO <sub>2</sub> Corrosion	MIC	Other Metal Loss	SSC/SOHIC/ SWC	Hydrogen Induced Cracking	Under Deposit Attack (Metal Thinning)	Water Corrosion	Atmospheric Corrosion
1. B Phase	X	depends on system design and needs to be addressed for all systems individually	Systems were dissimilar materials are connected	X	X		X(2)	X(2)			X
2. Gas Lift				X			X(2)	X(2)			X
3. Wet Crude	X			X							X
4. Drain (3)				X	X		X(2)	X(2)		X	X
5. Wet gas				X	X		X(2)	X(2)			X
6. Water					X				X	X	X
7. Condensate				X	X		X(2)	X(2)			X
8. Waste gas				X(1)			X(2)	X(2)			X
9. Air (4)											X
10. Lube oil					X				X	X	X
11. Fuel Gas				X(1)			X(2)	X(2)			X
12. Rich Glycol				X		X(5)				X	X
13. Lean Glycol						X(5)					X



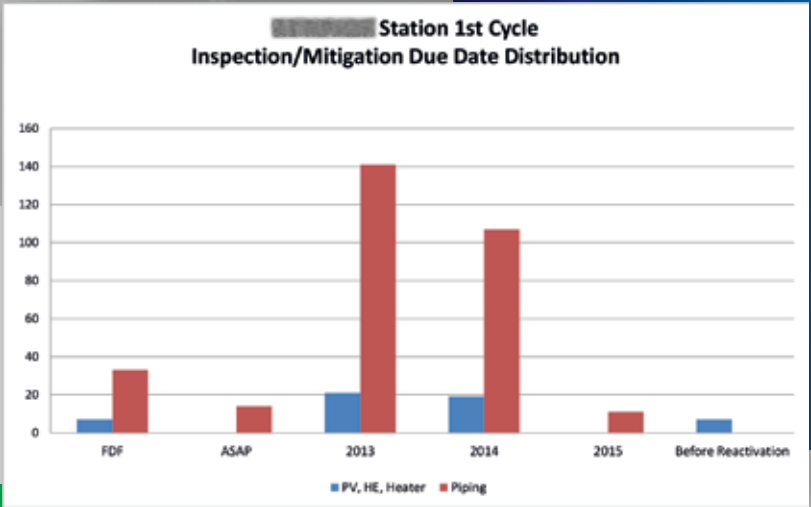
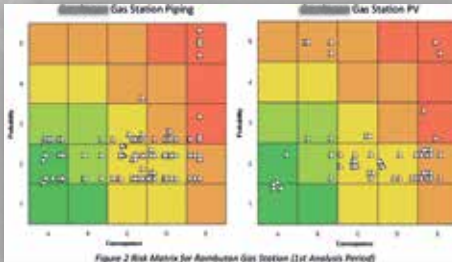
## Scope of Work

The process of RBI Study consisted of a logical and systematic approach to manage the plant's integrity by focusing the management action in prioritizing resources on critical equipment. It required a wide range of data to reliably assess the equipment's probability and consequence of failure and subsequently develop an inspection and/or mitigation plan to manage the risk.

Step of The RBI Study is performed as described below:

- Defining team members
- Building initial database for RISKWISE™.
  - Collect data and information to generate asset register
  - Define assumption for data and information which is not available
  - Create asset register.
  - Collect inspection history then summarize and enter the summary into the RISKWISE database.
  - Site visit to verify RBI scope and collect incomplete data undertake Damage Mechanism review, determine Remaining Life and input data into RISKWISE™. Potential Damage Mechanisms for each component were identified based on the design, operating data, inspection results and expert judgment.
- RBI Assessment:
  - o Conduct risk assessment by determination of the likelihood and consequence of failure LoF and CoF)
  - o Risk profile review (discuss with Client)
  - o Inspection and mitigation planning.
  - o Implementing inspection and mitigation plan

Focus/Defocus Variable	Focus/Defocus Method or Action
Analysis	1. In-depth historical data review 2. Remaining life assessment 3. Fitness-for-service assessment
Engineering	1. Re-rate equipment or component 2. Modify equipment or component
Inspection	1. Install leak detection system, 2. Optimize inspection plan 3. Implement on-line monitoring
Maintenance	1. Retain equipment or component spare 2. Repair/Replace equipment or component
Material	1. Apply protective coatings 2. Upgrade materials of construction
Operation	1. Adjust operating conditions



No	Tag No	OD (inch)	Nom T (mm)	Commision Date	MinT (mm)	Inspection Date	CR (mm/month)	Before FDF						Due Date	Estimate		Estimate MAWP		Proposed action	After FDF						Due Date	Note
								DT (F)	DP (Psi)	ReqT - DP (mm)	1AP	RLI	EL (Months)		May-13	May-14	May-13	May-14		OT (F)	OP (Psi)	ReqT - OP (mm)	1AP	RLI	EL (Months)		
1	KAQR-704	8.00	12.70	Jan-03	8.40	Jan-13	0.049	165	960	7.9	5B	0	10	Jan-13	8.25	7.66	1005	931	Estimated life assessment based on operating pressure		620	5.16	2B	9	66	Oct-13	
2	KAHR-712	6.00	10.97	Jan-03	6.80	Jan-13	0.046	200	1200	12.24	5B	0	0	Jan-13	6.66	6.11	1084	991	Estimated life assessment based on operating pressure		638	6.63	2B	22	106	Nov-14	
3	MBFR-108	39.00	30.00	Jan-04	29.86	Jul-12	0.038	200	1000	30.3	5E	0	0	Jul-12	29.52	29.06	984	969	Estimated life assessment based on operating pressure		595	14.91	2E	14	317	Sep-13	
4	MBFR-301 S	18.00	12.70	Jan-88	8.70	Aug-12	0.019	200	440	8.42	3E	1	15	Sep-12	8.55	8.32	454	442	Estimated life assessment based on operating pressure		352	6.76	2E	14	102	Oct-13	Operating pressure was assumed 80% design. Should be confirms
5	MZZK-702	10.00	28.58	Jan-97	20.40	Jan-13	0.061	250	2305	22.71	5B	0	0	Jan-13	20.22	19.48	2035	1956	Estimated life assessment based on operating pressure		590	6.139	2B	22	233	Nov-14	
6	MAFR-100	40.00	31.75	Jan-05	31.03	Jul-12	0.052	200	1000	30.42	5E	0	12	Jul-12	30.56	29.94	993	973	Estimated life assessment based on operating pressure		595	17.84	2E	14	253	Sep-13	