

RBI: CASE STUDY



OPTIMIZE PRD INSPECTION INTERVALS USING PRD RBI

The traditional inspection planning method for setting intervals for PRDs in the API 510 inspection code only considers the probability of failure of the valve. It does not consider the consequence and risk of a potential failure.

RBI is a more rigorous inspection planning method that sets intervals based on both the Probability and Consequence of Failure. RBI is a beneficial inspection method because in most facilities a large percent of the total risk is concentrated in a relatively small percent of the equipment items. RBI allows a facility to focus on the high-risk equipment and not on equipment with little to no risk.

PROBLEM

A facility asked E²G to determine acceptable PRD inspection intervals using an RBI planning method as opposed to the traditional inspection planning method they had been implementing.

CALCULATION BACKGROUND

- The RBI inspection intervals were determined using the API 581 PRD RBI technology.
- An acceptable risk level based on industry standards was used to determine the maximum interval a PRD could be in service without needing inspection.

BENEFITS TO THE CLIENT

- By shortening the high risk valves' inspection interval, the RBI assessment also decreased the overall risk of the valves by 60%.
- The RBI assessment increased the average PRD inspection interval from 4.3 years to 7.3 years (70% increase).

INSPECTION INTERVAL COMPARISON

Average Current Interval	Average RBI Interval
4.3 years	7.3 years

RISK COMPARISON

Total Current Risk Acceptable Risk	Total RBI Risk Acceptable Risk	Reduction
233%	94%	60%

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EXAMPLE OF INSPECTION PLAN COMPARISON (EXCERPT TAKEN FROM ANALYSIS)

PRD TAG NUMBER	PROTECTED COMPONENT	SERVICE FLUID	LAST INSPECTION DATE	CURRENT INTERVAL (YRS)	TOTAL CURRENT RISK / ACCEPTABLE RISK	RBI INTERVAL (YRS)	TOTAL RBI RISK / ACCEPTABLE RISK	NEXT RBI INSPECTION DATE
PRD-0007	C-3805	Naphtha H2S 0.5	Feb-2013	4.0	79%	4.7	100%	Oct-2017
PRD-0032	D-1605	C3 (H2S 2000PPM)	Nov-2012	4.0	118%	3.6	100%	Jun-2016
PRD-0044	C-41100	C1-C3	Feb-2013	4.0	126%	3.4	100%	Aug-2016
PRD-0045	C-1608	Air + Caustic	Nov-2012	4.0	67%	5.0	100%	Nov-2017
PRD-0053	D-4183	Mercaptan	Mar-2013	4.0	32%	8.2	100%	May-2021
PRD-0062	D-1655	LVGO	Mar-2013	4.0	31%	9.0	100%	Mar-2022
PRD-0064	D-1656	LVGO	Mar-2013	4.0	37%	8.0	100%	Feb-2021
PRD-0078	C-1909	C3-C4, Amine, Water	Feb-2013	4.0	58%	5.5	100%	Aug-2018
PRD-0086	D-1645	Fuel Gas	Feb-2013	4.0	96%	4.1	100%	Apr-2017
PRD-0305	D-1001	Steam	Dec-2012	4.0	22%	9.7	100%	Sep-2022
PRD-0354	G-1043A	Ammonia	Jan-2014	5.0	395%	2.0	100%	Apr-2016

