

FITNESS -FOR-PURPOSE (FFP)



There is increasing pressure on companies from global competition to optimise their return on asset investment. This requirement can be realised through optimising asset availability and life. Targeted improvement through the application of Asset Integrity Management is a controlled and effective means of optimising return on investment whether the asset is new or existing.

WOOD GROUP INTEGRITY MANAGEMENT (WGIM) is an independent, innovative, commercially pragmatic, total life cycle, materials engineering consulting company. WGIM brings together a group of engineering expertise across the globe with distinct market leadership in the life cycle fields of Materials (metallics and non-metallics), Corrosion, Cathodic Protection, Coatings, Metallurgy, Welding, Fabrication, Asset Management, Training, HSE, Risk and Integrity related engineering businesses. This expertise has been gained across a broad manufacturing and industrial base.

Our aim is to establish and maintain engineering leadership in the knowledge, application and practise of Technology, Products, and Services utilised in the pursuit of Life Cycle Management (LCM) of assets.

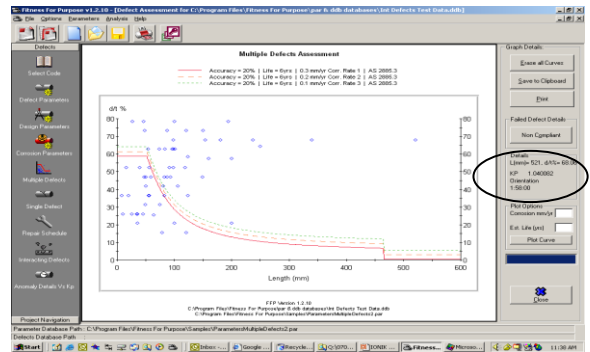


WGIM seek to provide a holistic LCM of assets service to industry. We take pride in our culture and are dedicated to integrity, flexibility, growth, quality, and success in all regards.

An integral part of this holistic service is the assessment of asset fitness for purpose (FFP).

WGIM's FFP approach to corrosion:

- Allows the client to differentiate between anomalies (requiring monitoring) and defects (requiring repair).



- Ensures third party independence for regulatory purposes and an assessment of inspection data quality/veracity that is not biased.
- Reviews historical background of the asset including design, material, construction, and inspection, maintenance and repair data.
- Reviews corrosion management philosophies and practices with a view to providing constructive feedback on the efficacy of these systems.
- Models future corrosion growth based upon theoretical (e.g. De Waard & Milliams, NORSOK) and actual (e.g. multiple inspections, iron counts etc.) corrosion rates to obtain remaining life estimates of an asset or derive repair schedules/programmes for the

Ep	Observations	Length	Width	Depth	Depth	Intermetal?	Crack?	ERF	Within 80% Wall Limit
1	1000095	12.40	150	9	73.3	58.64	YES	0	N/A
	1000247	1.20	91	4	52.36	41.89	YES	11.31	1.06
	1010338	12.30	200	6	57.59	46.07	YES	9.03	1.33
	1012584	12.40	200	59	20.94	16.75	E	11.83	1.01
	1015624	12.52	194	35	78.53	62.82	YES	0	N/A
	1019089	12.40	120	26	73.3	58.64	YES	0	N/A
	1019223	1.00	98	45	68.06	54.45	YES	0	N/A
	1027439	12.20	73	66	62.83	50.26	YES	11.3	1.06
	1027536	12.40	26	15	78.53	62.82	YES	0	N/A
	1029236	12.00	101	50	62.83	50.26	YES	10.4	1.15
	1028457	12.40	100	40	78.53	62.82	YES	0	N/A
	1034639	12.40	54	35	62.83	50.26	YES	11.98	1.00
	1038928	1.08	154	50	68.06	54.45	YES	0	N/A
	1040982	1.58	1521	40	68.06	54.45	YES	0	N/A
	104369	1.00	48	5	73.3	58.64	YES	0	N/A
	1043746	2.00	160	35	57.59	46.07	YES	9.54	1.26
	1045916	8.00	123	20	56.64	46.91	YES	10.15	1.18
	1050029	12.00	123	4	36.65	29.32	YES	11.54	1.04

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client.

- Presents a range of inspection (e.g. closer inspection intervals) and operational options (e.g. derating options) to ensure the continued fitness for purpose of an asset.
- Facilitates asset relifing decisions feeding FFP results into economic models.
- Ensures compliance to safety and environmental regulations/standards.

When an FFP analysis is required, WGIM employs collaborative working arrangements pulling together the best team for the job, which usually requires a mix of skills and experience. WGIM can provide, as required, specialists in materials, structural, mechanical, corrosion, welding and process engineering.

WGIM has the following FFP capabilities:

Integrity assessment to the following codes/practices:

- Corrosion: DNV RP F101 (ASD & PSF), ASME B31G, NG-18, Shell 92, RSTRENG (Simplified and Detailed), and AS 2885.3
- Crack & Fatigue Crack Growth: BS 7910
- Multiple Failure Modes: API RP 579 (general, local metal loss, pits, brittle fracture, blisters and laminations, cracks, weld misalignment/shell distortions/dents/gouges, creep, fire damage)
- Span assessments: UK HSE guidelines, DNV Guideline 14, and DNV RP F105
- Stability assessments: AGA Level I, II & III, JPK Simulator
- Remaining life assessments based upon different corrosion growth models

Corrosion modelling to the following codes/practices:

- NORSOK M-506
- De Waard & Milliams
- Cassandra

Flow modelling using the following packages:

- OLGA
- PipeSim

