

## Project Profile

**Trihasco**

**Utama**

Inspection and Engineering company

**Giving  
Value  
Added  
for  
Your  
Asset  
Safety**



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**Utama**

Inspection and Engineering company

## Contact :

Wisma PMI 3<sup>rd</sup> & 4<sup>th</sup> Floor  
Jl. Wijaya I No. 63 Kebayoran Baru  
Jakarta Selatan 12170  
\* Move to new building an April 2015  
Graha Trihasco  
Jln. Puri Sakti I No. 30 Cipete Selatan  
(Antasari) Jakarta Selatan 12410  
INDONESIA

Telp : +62 21 7204105  
Fax : +62 21 7255584  
info@trihasco.com  
www.trihasco.com

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

**RISK ASSESSMENT FOR  
RE-CERTIFICATION OF 28" GAS PIPELINE**



# RISK ASSESSMENT FOR RE-CERTIFICATION OF 28" GAS PIPELINE

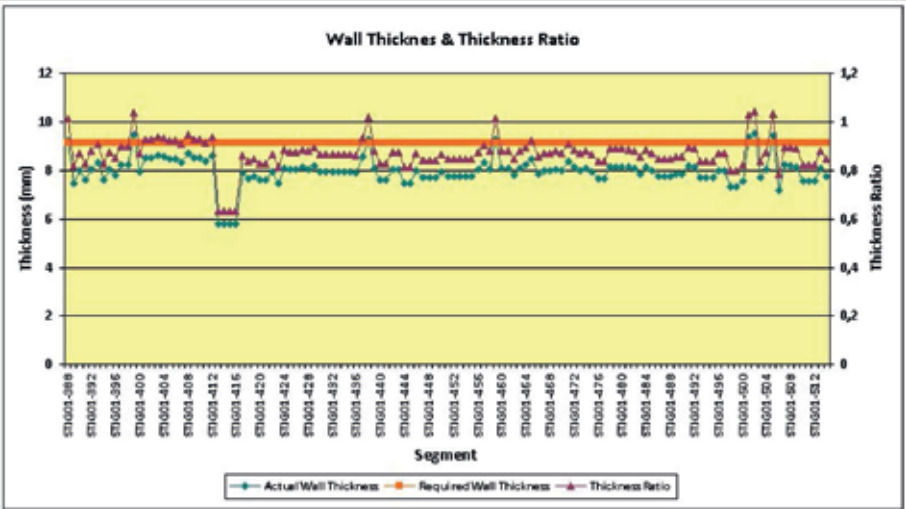
According to Indonesian government regulation which written in Indonesian Directorate General of Oil and Gas (Ditjen Migas) decree No 84.K/38/DJM/1998, it is mandatory for Oil and Gas Company to have operating permission or held re-certification every three years for its static equipment including pipeline.

For existing pipeline, risk assessment is part of work to do to ensure that the pipeline still able to be operated safely or not.

PT. Trihasco Utama has appointed by several Oil and Gas Company to conduct risk assessment for pipeline certification. One of our experience is risk assessment for certification of 28" gas pipeline from Grissik to Sakernan (136.000 meters)

## Scope of work:

- 1.Independent analysis/review of design and operation document
- 2.Inspection report review
  - a.Result of NDT report review
  - b.Result of Visual Inspection review



- 3.Perform/review mechanical calculation
  - a.Determine/review corrosion rate
  - b.Calculating/review current Maximum Allowable Operating Pressure (MAOP)
  - c.Estimate/review remaining life of equipment

Required Design Wall Thickness - Straight Steel Pipe ASME B31.4 Art. 404.1 (Revision: 10.0.0)

Project: PT. transgasindo  
Location: Grissik - Sakernan  
Date:   
Notes:   
Select Pipe Dimensions & SMYS:  
☒ Line Pipe - API Specification 5L  
☐ Standard Steel Pipe - ASTM - ANSI B36.10  
Line Pipe API 5L  
Nominal Pipe Size: 24  
Grade: X65  
Wall Thickness [in.]: 0.500  
E - Weld Joint Factor:  
Electric Resistance Welded and Flash Weld  
F - Design Factor, DOT Code, Part 195:  
On-shore pipeline F = 0.72  
Input:  
Outside Pipe Diameter [in.]: 24  
Internal Design Pressure [psig]: 1150  
SMYS Specified Minimum Yield Strength [psi]: 65000  
E - Weld Joint Factor: 1.00  
F - Design Factor: 0.72  
A - Sum of Allowances [in.]: 0.00  
Results:  
Required Design Wall Thickness [in.]: 0.360  
Applicable Allowable Stress [psi]: 37,360  
Buttons: Save, Report, Calculate



- 4.Likelihood of Failure Assessment
  - a.Third Party Damage Index determination
  - b.Design Index determination
  - c.Incorrect Operation Index determination
  - d.Corrosion Index determination

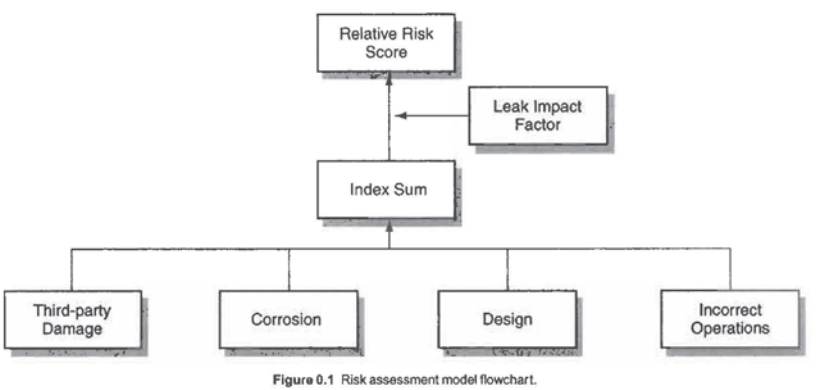
Tabel 2.2 Skenario Mitigasi Berdasarkan Skor Atmospheric Corrosion Index

No.	Items	Kategori Item	Skore Rata-Rata CI Saat Ini	Kemungkinan Untuk Diperbaiki	Target Skor CI Baru
1	Atmospheric Corrosion				
1.1	Atmospheric Exposures	Attribute	1,00	Sulit	1,00
1.2	Atmospheric Type	Attribute	1,20	Sulit	1,20
1.3	Atmospheric Coating	Prevention	3,00	Bisa	3,00
2	Internal Corrosion				
2.1	Product Corrosivity	Attribute	7,00	Sulit	7,00
2.2	Internal Protection	Prevention	0,00	Bisa	4,00
Rata - Rata Corrosion Index			12,20		16,20
Likelihood Category			3		3

Tabel 2.3 Skenario Mitigasi Berdasarkan Skor Subsurface Corrosion Index

No.	Items	Kategori Item	Skore Rata-Rata CI Saat Ini	Kemungkinan Untuk Diperbaiki	Target Skor CI Baru
1	Internal Corrosion				
1.1	Product Corrosivity	Attribute	7,00	Sulit	7,00
1.2	Internal Protection	Prevention	0,00	Bisa	4,00
2	Subsurface Corrosion				
2.1	Subsurface Environment				
	Soil Corrosivity	Attribute	11,74	Sulit	11,74
	Mechanical Corrosion	Attribute	0,00	Sulit	0,00
2.2	Cathodic Protection	Prevention	17,85	Bisa	25,00
2.3	Coating	Prevention	19,76	Bisa	25,00
Rata - Rata Corrosion Index			56,36		72,74
Likelihood Category			2		1

- 5.Consequence of Failure Assessment
  - a.Leak Impact Factor determination
- 6.Determine pipeline risk score, conclusion and recommendation



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DAFTAR ISI

DAFTAR GAMBAR

1. PENDAHULUAN

1.1. UMUM

1.2. TUJUAN

1.3. RUANG LINGKUP

2. METODOLOGI

2.1. UMUM

2.2. REPRESENTASI VISUAL JALUR TRUNKLINE DAN SEGMENTASI

2.3. ASSESSMEN RISIKO

2.3.1. Third Party Damage Index

2.3.1.1. Minimum Depth of Cover

2.3.1.2. Activity Level

2.3.1.3. Aboveground Facilities

2.3.1.4. Line Location

2.3.1.5. Right-of-way Condition

2.3.1.6. Public Education Programs / Public Awareness Program

2.3.1.7. Patrol Frequency

2.3.2. Corrosion Index

2.3.2.1. General Atmospheric

2.3.2.2. Internal Corrosion

2.3.2.3. Subsurface Corrosion

2.3.3. Design Index

2.3.3.1. Safety Factor

2.3.3.2. Fatigue

2.3.3.3. Surge Potential

2.3.3.4. Integrity Verifications

2.3.3.5. Land Movements

2.3.4. Incorrect Operation Index

2.3.4.1. Design

2.3.4.2. Construction

2.3.4.3. Operation

2.3.4.4. Maintenance

2.3.5. Leak Impact Factor (LIF)

2.3.5.1. Product Hazard

2.3.5.2. Dispersion Factor

2.3.5.3. Liquid or Vapor Spill Score

2.3.5.4. Population

2.3.6. Relative Risk Score

2.3.7. Representasi Level Risiko Segmen Pipa

2.3.8. Konversi Relatif Risk Score Menjadi Risk Matrix

2.3.8.1. Universal Index Menjadi Rating Probabilities

2.3.8.2. Rating Probabilities

2.4. RINGKASAN

2.5. TUGAS

3. DATA

3.1. UMUM

3.2. DATA DATA

3.3. DATA REVIEW

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2.3.1. Gas Composition

2.3.2. Wall Thickness

2.3.2.1. Wall Thickness Design (Existing)

2.3.2.2. Ringkasan Data Katerbalan Awal Pipe Grissik - Sakernan

2.3.3. Hoop Stress, Design Factor dan Safety Factor

2.3.4. Sample Point

2.3.5. Safety Factor

2.3.6. Annual

2.3.6.1. Corrosion

2.3.6.2. Over

2.3.6.3. Material Object

2.3.7. Corrosion Protection and Program

2.3.7.1. Corrosion Coupon

2.3.7.2. Pipe to soil potential monitor

2.3.7.3. Cathodic protection (Impressed current protection system)

2.3.8. Safety Valves

4. ASSESSMEN RISIKO

4.1. Lokasi Pipa

4.2. Segmentasi

4.3. Leak Impact Factor

4.4. Time-Planned Inspection

4.4.1. Minimum Depth of Cover

4.4.2. Activity Level

4.4.3. Aboveground Facilities

4.4.4. Line Location

4.4.5. Right-of-way Condition

4.4.6. Public Education Program / Public Awareness Program

4.4.7. Patrol Frequency

4.4.8. Level Risiko

4.5. Corrosion Index

4.5.1. General Atmospheric

4.5.2. Internal Corrosion

4.5.2.1. Product corrosivity

4.5.2.2. Anti corrosion activity / internal protection

4.5.3. Subsurface Corrosion

4.5.3.1. Subsurface Environment

4.5.3.2. Cathodic protection

4.5.3.3. Coating

4.5.4. Level Risiko

4.6. Design Index

4.6.1. Safety Factor

4.6.2. Fatigue

4.6.3. Surge Potential

4.6.4. Integrity Verifications

4.6.5. Land Movement

4.6.6. Level Risiko

4.7. Incorrect Operation Index

4.7.1. Design

4.7.2. Construction

4.7.3. Operation

4.7.4. Maintenance

5. KESIMPULAN DAN REKOMENDASI

6. REFERENSI