

ENGINEERING + SERVICES



INSPECTION, MAINTENANCE +  
RECERTIFICATION (IMR)





## 7 STEPS TO HOSE VALUE AND REGULATORY COMPLIANCE



Periodic inspection and testing of flexible hose assemblies is an essential component of a effective hose management program. Assemblies being removed and repurposed should also be inspected and tested to ensure the hose meets application demands. In drilling and well service applications onshore and offshore, an IMR program helps maximize asset reliability, value, and uptime.

Gates Engineering + Services (E+S) offers complete IMR service to meet OEM revalidation procedures and recommended best practices, while complying with industry standards. Hose applications include:



- › Rotary Drilling/Vibrator
- › Cementing
- › Choke + Kill
- › BOP Lines
- › Sour Service
- › Drag Chain

With over 20 years experience in hose recertification and 100 of manufacturing experience, Gates offers IMR services through on-site modular mobile units or an E+S service facility. The service produces quantifiable business value via these client benefits:

- › Improved equipment integrity
- › Optimal production revenue
- › Reduced cost of non-compliance
- › Lower risk of:
  - › unscheduled maintenance
  - › property damage
  - › personnel injury
  - › environmental cleanup

Application performance requirements, as well as regulatory standards, require visual exterior inspection, visual interior inspection and hydrostatic testing before a hose assembly can be returned to service. Gates goes beyond these three requirements with our IMR service.

**A comprehensive hose management program, including IMR, can deliver more than \$40K-\$340K/hour of customer business value through increased operational performance and reliability.**

**Hose management/IMR, through the reduction of HSE events, can deliver \$250K savings per HSE event avoided.**



# GATES 7-STEP IMR SERVICE



## Step 1 > Hose Identification and Specifications

The following information is recorded on an IMR Identity Sheet before inspection and testing.

- › Hose serial number
- › Hose I.D.
- › Overall assembly length
- › Application
- › Maximum working pressure
- › Test pressure
- › Last inspection date
- › Manufacture date

## Step 2 > External Cleaning

Using a soap/degreaser/water mixture, the entire length of the hose is scrubbed to loosen all dirt and debris on the cover and fittings.



## Step 3 > Internal Cleaning

The inside of the hose is cleaned using a high pressure washer. Degreaser is then passed through the hose to ensure the inner tube is cleaned. An air gun shoots a foam pellet down the length of the hose until the tube is dry.

## Step 4 > External Inspection

The external cover is physically and visually inspected for damage or abnormalities. End fittings and seals are closely inspected for deformations or marks. Any damage to the outer cover or fittings is noted and may be visually recorded as well. The hose assembly must pass this inspection before proceeding to the next step.



## Step 5 > Internal Endoscopic or Borescopic Inspection

An endoscopic camera or borescope is used to examine and record the condition of the inner tube of the hose assembly. Tears, gouges, abrasions, and cracks are identified and noted. For smaller diameter hoses internal inspections can also be carried out using a long mirror which can inspect the canule (inner end fitting). The hose assembly must pass this inspection before proceeding to the next step.

## Step 6 > Hydrostatic Pressure Testing

Hydrostatic tests are used to verify the integrity of the hose and coupling interface, as well as confirm that hose reinforcement is completely intact. Testing is conducted in accordance with the OEM's specification, industry and regulatory standards, and may include specific customer requirements. During this step, the hose assembly is inspected for leaks, malfunctions, and all results are recorded.

Pressure testing capabilities include:

- › 60,000 psi/414 MPa pressure test
- › 25,000 psi/172 MPa pressure test and chart recording
- › 45,000 psi/310 MPa pressure test and chart recording
- › 2,000 psi/13.7 MPa pressure test (high volume)

- › Die penetrant testing
- › Air/water submersion leak testing

Example of a Coflexip® hose test: in accordance with API RP53, API RP17B, API 7K, and API 16C, these test pressures are relevant to:

Working Pressure (psi/MPa)	OEM Test Pressure (psi/MPa)	Holding Time (hrs.)
5,000/34.5	10,000/70	24
10,000/70	15,000/103.5	24
15,000/103.5	22,500/155	24

#### Step 7 › Recertification + Documentation

After passing all inspection and hydrostatic testing requirements, it will be recertified and documentation will be provided.

IMR Reports:

- › Inspection Report (Original)
- › Pressure Test Certificate (Original)
- › Dual Pen Chart (Attested True Copy)
- › Calibration Certificates (Attested True Copies)
- › Release Note from certified third party witness body (Attested True Copies)
- › Endoscopic video (optional at extra cost if required)

#### MEET NEW REGULATIONS AND STANDARDS

Aggressive and comprehensive regulations and oversight are being initiated to improve the safety, efficiency and environmental custodianship of drilling activities worldwide.

- › Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) will strengthen U.S. drilling requirements on the U.S. outer continental shelf for everything from well design, permitting, and workplace safety to environmental responsibility and corporate accountability.
- › UK Offshore Operators Association (UKOOA) works to strengthen the offshore oil and gas industry in the UK, preparing documentation such as Flexible Hose Management Guidelines.

Many other organizations worldwide provide industry standards, policies, regulations, and recommended practices covering every aspect of drilling activity and well control such as API, DNV, and ABS.

Gates IMR service assists clients in all aspects of regulatory compliance and recertification of all hoses installed on rig equipment.





**POWERING PROGRESS™**

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