

LNG Carriers - Excessive Boil Off Gas (BOG) Exposure During Congestion, Drifting and Standby



Introduction

This risk alert outlines the heightened operational, commercial and contractual risks for LNG carriers when extended congestion or standby conditions disrupt normal boil-off gas management, often leading to increased boil off gas (BOG) exposure, constrained mitigation options, and disputes over cost, time and cargo allocation. Maintaining accurate operational data and clear records of instructions is essential in supporting causation analysis and defending claims relating to incremental BOG. This may necessitate reliquefaction or controlled combustion, both carrying cost and emissions implications. Prolonged delays increase the likelihood of non-standard operating conditions and disputes, particularly where charterparty provisions are unclear.

Background and Industry Drivers

In congested markets, terminals may operate near storage limits, causing nominations to change at short notice and vessels to remain on standby for extended periods. Where ship-to-ship (STS) alternatives are limited, operators may have no practical option other than to wait offshore or manage speed to align with revised cargo operating windows. These circumstances increase time-at-risk for natural boiloff and can push cumulative boil off gas (BOG) beyond the contractual allowance, even where the vessel is technically well run.

A practical challenge being faced is that charterparty wording is often optimised for 'normal' trading rather than prolonged harbour-mode operations. If the contract does not expressly address incremental BOG generated at the time of ordered waiting, the dispute can become a fact and data-intensive exercise: who caused the delay, what could realistically have been mitigated, and how the BOG should be calculated.

Common Claims

1. Cargo quantity / energy short delivery allegations

Claims may be presented as short delivery by volume, mass or energy content compared with expectations at discharge. Counterparties may allege breach of boil-off warranties, improper cargo handling, or failures to mitigate. Disputes frequently turn on the calculation methodology and whether the vessel was operating under abnormal instructions or terminal restrictions outside Owners' control.

2. Performance and consumption disputes where cargo becomes fuel

Because BOG can be consumed as fuel, disputes can blur the line between cargo loss and fuel consumption performance.

Charterers may allege underperformance and seek deductions, while Owners may argue that increased BOG use was driven by Charterers' instructions and that any economic benefit from BOG replacing conventional bunkers should be allocated fairly.

3. Off-hire allegations linked to cargo machinery and prolonged standby

Extended standby can impose non-standard duty cycles on cargo systems such as compressors, reliquefaction equipment, fuel gas supply systems and gas combustion units (GCU). Any malfunction, derating or inability to maintain cargo parameters may lead to off-hire arguments, particularly where the off-hire clause is drafted broadly or where the vessel cannot comply with orders without restriction.

4. Interface and compatibility disputes

Interface issues relating to Emergency Shut Down (ESD) links, vapor return arrangements, manifold and loading arm limits, nitrogen/inerting requirements, sampling protocols or terminal specific procedures can prevent timely berthing or constrain operations. These delays can amplify BOG exposure and become central to delay attribution disputes.

An ESD may be activated if BOG-related conditions create an unsafe situation, regardless of vessel status (e.g. at anchor), such as:

- Excessively high cargo tank pressure approaching safety limits
- Failure of BOG compressors or gas handling equipment
- Gas leakage detected in machinery spaces or cargo areas
- Fire or gas detection alarms associated with the BOG system.
- Malfunction of critical cargo control systems

5. Emissions and compliance Cost Allocation

Where excess BOG cannot be consumed as useful energy, it may need to be liquefied (increasing power demand and fuel use) or burned without propulsion benefit. These choices can increase reported emissions and may drive compliance costs under applicable regimes. Where contracts are silent, counterparties may attempt to shift incremental costs in ways that were not anticipated at fixture.

Operational Controls and Best Practice

Standby BOG Management Plan

Members are recommended to implement a written standby BOG management plan that is activated when delays, drifting or speed restrictions are foreseeable. The plan should define the operational hierarchy for BOG handling, considering safety, equipment limitations and anticipated duration. It should also set out internal escalation triggers and the format of daily reporting to chartering/operations teams.

During standby, logs should record not only the actions taken to support BOG management, but why they were necessary. Contemporaneous narrative entries with supporting evidence describing charterers' instructions, terminal constraints, power demand limitations and safety considerations can materially improve a claim's defensibility and reduce the risk of retrospective arguments.

Notices and communications

Where instructions to drift, slow steam or wait offshore are received, Members should issue prompt written notices confirming the instruction, expected schedule impact and foreseeable BOG consequences. These notices should be calm and factual.

The objective is not to allocate blame in real time, but to ensure that all parties have a shared understanding of the operating context and the data that will be used later if figures are challenged.

STS as mitigation

If STS is considered to mitigate delay exposure, feasibility should be assessed against vessel approvals, state/terminal constraints and recognised industry guidance. If STS is not available or practicable, Members should document enquiries made and the constraints encountered. This helps demonstrate that reasonable mitigation was explored.

Risk Mitigation Checklist (Practical)

When congestion develops, good outcomes usually result from small, disciplined early steps. The checklist below is designed to be used by chartering, operations and the Master together. It is deliberately balanced: it focuses on safety first, then preserving options, then protecting the evidential position if a dispute later arises.

A. Before fixing

- Confirm the vessel's BOG management capability (Reliquefaction fitted or not, re-condenser capacity, GCU limits) and ensure the commercial team understands and appreciates any practical harbour-mode constraints.
- Agree a clear boil-off calculation methodology and data set (ship and shore measurement basis on daily calculation method; treatment of heel, temperature and cargo composition variances).
- Agree a fair BOG-as-fuel credit mechanism so neither side feels they are subsidising the other when cargo gas displaces conventional bunkers.
- If trading into regulated regimes, include a simple cost allocation for any incremental emissions or allowances arising from BOG disposal choices during abnormal delays.
- Align and agree terminal interface responsibilities (ESD compatibility, vapour return, nitrogen and inert gas specifications, manifold limits, and sampling protocols) and establish a clear notification and escalation route prior to commencing cargo transfer.

This should include arrangements for routine updates, deviations, alarms, shutdowns, and emergencies to support timely decision making and safe operational control.

B. On receipt of revised orders

- Obtain revised berthing window and any terminal constraints in writing and preserve the full message trail (agent, charterers, scheduler).
- Issue a short delay, instruction notice confirming the order to drift, slow steam, wait and stating, neutrally, the likely BOG and emissions implications if the delay persists.
- Activate the vessel's standby BOG management plan and agree internally who is responsible for daily reporting and escalation.
- Consider mitigation options such as alternative discharge location, partial discharge or STS and document why individual options may or may not be feasible.

C. After berthing / on completion of discharge

- Secure and index the voyage evidence bundle (instructions, terminal communications, BOG logs, cargo machinery run hours, alarms, GCU events, custody transfer documents).
- Reconcile calculations early using the agreed methodology; if disagreement remains, consider an independent LNG performance expert review before the dispute escalates.
- Notify the Club early if performance deductions, cargo shortage allegations, off-hire claims or emissions cost recovery is/are being pursued.

D. During standby / drifting

- Record daily BOG rate, tank pressure and temperature trends, plant mode, power demand and any constraint that limits BOG utilisation.
- If the GCU is used, make a contemporaneous narrative entry explaining the safety driver, the alternatives considered and the duration and rate; notify charterers promptly.
- Preserve evidence of external drivers such as weather, sea state, swell, sloshing, ambient temperature or berth unavailability, and correlate with BOG trends where practical.
- Keep communications calm and factual, focus on safety, compliance, mitigation attempts and the data being recorded.

Evidence Pack (Minimum Recommended Records)

A successful defence typically depends on demonstrating causation and quantifying any incremental BOG attributable to the delay or instructions. Members are recommended to retain a single consolidated voyage bundle containing BOG generation and consumption records, cargo tank temperature and pressure trends, cargo machinery operational parameters, GCU run logs (where applicable), engine and generator load data, and all alarm and maintenance records relevant to cargo systems. The bundle should also include all voyage instructions, terminal communications relating to berthing windows and restrictions, and contemporaneous weather and sea state records where sloshing is alleged. Custody transfer documentation at loading and discharge should be preserved together with shipboard measurement records and calibration certificates as appropriate.

IAS / CTS Evidence

In LNG boil-off and Reliquefaction disputes, the most persuasive evidence is usually the vessel's time-stamped system data. Wherever there is the possibility of a dispute Members are encouraged to preserve an export from the Integrated Automation System (IAS) and the Custody Transfer System (CTS), before data retention cycles overwrite records. This helps both Owners and Charterers to reconcile facts quickly and reduces argument about how the vessel performed.

Integrated Automation System (IAS)

The IAS records time-stamped data across cargo tanks, machinery and power systems, including BOG rates, plant performance and alarm events. This data supports analysis of operations and fuel use. However, older systems may overwrite or limit data retention, weakening event reconstruction and increasing the risk of disputes over timing, causation and vessel performance.

Modern IAS systems improve monitoring and integration but depend on accurate GPS/NTP synchronisation and unified event timelines for evidential reliability. Fragmented system architectures can hinder correlation between BOG generation, propulsion demand and fuel use, increasing the risk of challenge to performance explanations and operational efficiency.

Traditional IAS systems provide raw operational data but lack advanced causation analysis, limiting their ability to attribute excess BOG to specific drivers such as weather-induced sloshing, standby instructions, or reliquefaction constraints. By contrast, advanced platforms support detailed event sequencing (e.g. compressor trips, GCU activation), root cause reconstruction, alarm and operator tracking, BOG accumulation analysis, propulsion–fuel correlation, and predictive tank pressure trend analysis.



Custody Transfer System (CTS)

The CTS records and verifies cargo quantities and quality during loading and discharge, providing the formal basis for custody transfer. It captures key measurements, sampling and supporting records, with logs of any adjustments. Preserving these records, alongside IAS data and communications, supports accurate reconciliation and helps resolve potential short delivery or BOG disputes. All sampling and laboratory documentation linked to custody transfer including Certificate of Analysis (COA) sampling times, chain of custody, sample point identification, and any disputed samples should be retained. Preserving any CTS exception and override logs, including manual entries, corrections and configuration changes made during the cargo operations can be beneficial for any disputes about short delivery versus BOG. Owners and Charterers should consider early agreement for a shared 'data bundle' that includes IAS exports, CTS reports, statement of facts or time sheets, and the instruction and terminal communication trail.

Charterparty Considerations

Charterparties address BOG exposure arising from delays, drifting or standby in different ways, depending on the form in use, commercial context and negotiated terms. In practice, a balanced and commercially neutral approach will typically align BOG outcomes with delay attribution, often through laytime and demurrage mechanisms or performance provisions, while seeking to ensure clarity on how incremental BOG and associated costs are assessed and allocated.

During periods of congestion, drifting, standby, slow steaming or other operational restrictions, LNG carriers may experience increased boil-off gas (BOG) that cannot be utilised through normal propulsion or power demand. Charterparties commonly address how any incremental BOG, reliquefaction costs, GCU use, emissions-related charges and associated economic benefits are assessed and allocated between the parties.

Clear record keeping, including cargo condition data, tank pressures, temperatures and BOG rates, can assist in supporting calculations and reducing disputes. Where prolonged delays are anticipated, consideration may also be given to reasonable mitigation measures, including alternative discharge arrangements or STS operations, where safe and practicable. In practice, transparency of operational data and a clearly agreed methodology for assessing excess BOG can significantly reduce the scope for disagreement.

Voyage Charters: check at fixture stage

In voyage charters, boil off disputes frequently become disputes about whether time counts as laytime or demurrage, whether NOR was validly tendered and accepted, and whether the vessel was ready in all respects as required by the charter and terminal. Before fixing, Members should review these areas and, where possible, introduce wording that avoids a gap between the laytime position and the boil off position. NOR ensures the readiness standard (including cargo systems, ESD compatibility and documentation) is clear and achievable, and ambiguity here can shift delay risk and therefore the BOG position. Boil off allowance and method should define the calculation method and the agreed data set so the figures can be reconciled later without argument. Safety operations, such as GCU or controlled combustion, should confirm that safety driven BOG disposal is permitted and agree a simple notice and documentation protocol.

Demurrage is agreed as the liquidated damages remedy for time lost. For the avoidance of doubt, unless expressly stated otherwise, (e.g. BIMCO LNGVoy Clause 23) the charterparty should clearly address whether incremental BOG losses and documented BOG management costs, including safety driven GCU use, are recoverable as part of demurrage or as separate claims. NOR should not be invalidated due to reduced power operation while waiting to berth, provided the vessel remains ready in all respects required by the Charter and applicable terminal procedures. Any rejection of NOR should be promptly justified in writing. During any delay exceeding an agreed period of time (say, 48 or 72 hours), Owners should provide a detailed daily summary of BOG rates, cargo condition, including tank pressures and temperatures, and any GCU use. The parties should seek to reconcile any claimed excess boil-off within, say, 14 days of discharge using the agreed methodology, prior to escalation.

Case Study

The following case study is intended to show how disputes can typically develop and what mitigation tends to help resolve them. It should not be treated as a statement of any particular incident.

Scenario

An LNG carrier loaded in the Middle East for discharge at a Gulf terminal. Shortly before arrival, the terminal advised that storage constraints and a rolling berthing schedule would delay the berth by approximately seven days. Charterers instructed the vessel to wait offshore and to manage speed to remain ready while minimising costs. During standby, propulsion demand was minimal and the ship's power load remained low.

Operational impacts

BOG generation continued at natural rates and increased during periods of elevated ambient temperatures and intermittent swell. The vessel operated the reliquefaction plant at high utilisation, however, plant capacity and safe operating limits meant that it was not always possible to recover all BOG. On two occasions, for safety reasons, tank pressure trends required controlled combustion in the GCU. Owners issued contemporaneous notices recording the standby instruction, the BOG trend, and the safety driven operating mode.

The dispute

At discharge, the delivered energy was marginally outside the charterparty's standard boil off allowance. Charterers sought a deduction for excess boil off and alleged underperformance. Owners responded that the incremental BOG was causally linked to the standby instruction and berth delay, and that reasonable mitigation was applied within safe operating limits, supported by daily logs, plant data and notices

Resolution and lessons learned

The dispute narrowed once both sides reconciled their calculations using a shared data set covering instructions, daily BOG rates, plant run hours, power demand and GCU events. A practical settlement was reached by applying an instructed standby, incremental BOG allocation method and a balanced credit approach, recognising that BOG consumed as fuel reduced conventional bunker consumption at certain points. The key lessons were the value of early notices, narrative logs explaining why decisions were taken, as well as defined calculation methodology and express charterparty language allocating incremental BOG and related costs during instructed standby.

Resources

[SIGTTO-guidance on-LNG-carriers](#)

[Reduction of LNG Carrier Methane Emissions | SIGTTO](#)

Supportive Information

For further information on this or other Loss Prevention topics please contact the Loss Prevention Department, Steamship Insurance Management Services Ltd.

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