



GUIDE FOR

HYDROCARBON BLANKET GAS SYSTEM

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**American Bureau of Shipping
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Foreword

ABS has been requested by the industry and regulatory bodies to provide guidelines to address the arrangements where hydrocarbon produced gas is used as a blanketing gas to maintain a non-explosive atmosphere inside the cargo storage tanks of ABS Classed floating production units.

This Guide has been written for worldwide application and as such, compliance with individual requirements may require comprehensive data, analyses and plans to be submitted to demonstrate the adequacy of the system. ABS acknowledges that there is a wide range of documents that may be required for submittal to satisfy this type of blanketing system. It is not the intention of this Guide to impose requirements or practices in addition to those that have previously proven satisfactory in similar situations.

ABS currently has requirements for tank blanketing systems using produced gas in 3-5/5.3 of the *ABS Rules for Building and Classing Facilities on Offshore Installations*. Design and installation requirements presented in this Guide are based on existing industry practice and criteria employed by ABS in the review of such systems that are deemed to provide an adequate level of safety equivalent to traditional “Inert Gas Systems”. The application of this Guide by ABS will not seek to inhibit the use of any technological approach that can be shown to produce an acceptable level of safety.

With the use of hydro carbon blanketing systems, oxygen is eliminated from cargo tanks via the use of produced gas, forming an atmosphere within the tank, saturated with hydrocarbon to a level above the UEL, at which combustion cannot be supported (too “rich” to burn).

Advantages to a HC blanketing system are (1) using a medium which is readily available in large volumes which can continuously protect a multitude of large tanks, (2) evaporation in the cargo tank is minimal and the displaced gas from the tanks can be easily recovered resulting in a safe closed system which enable substantial reduction in volatile organic compound (VOC) emissions to the atmosphere. However, one of the disadvantages of using a HC blanketing system is that an Inert Gas (IG) blanket system must be kept as backup to the HC blanketing system, should the supply of the HC blanketing medium become unavailable

Currently more than 20 offshore production platforms world-wide are using hydrocarbon gas for tank blanketing and ABS expects more to come as this system is becoming a standard in the industry.

This Guide is to be used in conjunction with other ABS Rules and Guides, as specified herein.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.



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SECTION 1 General

1 Scope and Applicability

This Guide applies to floating production installations equipped for storage of liquid hydrocarbons, where hydrocarbon gas is used for tank blanketing as permitted in 3-5/5.3 of the *ABS Rules for Building and Classing Facilities on Offshore Installations (Facilities Rules)*.

Blanketing systems employed in crude storage tanks and slop tanks are to comply with the requirements in Section 4 of this Guide.

Blanketing systems employed in a single tank containing low flash point flammable liquid [flash point of 60°C (140°F) or less], such as methanol tanks built as a hull or integral tanks are to comply with the special considerations in Section 5 of this Guide.

3 Plans and Data to be Submitted

3.1 Documents Required for Review

- i) Document showing standard construction details for piping systems.
- ii) Arrangement showing the location of the liquid hydrocarbon storage hull tanks.
- iii) Process and instrumentation diagrams of the hydrocarbon gas blanket system clearly indicating connection to:
 - a) Cargo tanks system,
 - b) Inert Gas system,
 - c) Venting System; and,
 - d) Cargo tank vents recovery system, as applicable
- iv) Cargo tank venting system, purging and gas freeing systems, including details and setting of the pressure/vacuum valves (relief valves).
- v) Cause and Effect matrix and Safety Analysis Function Evaluation (S.A.F.E.) charts for the system.
- vi) Since the hydrocarbon blanket gas system is a part of the topside process system, the same is to comply with safety system requirements in 3-3/13.3, "Safety System" and Chapter 3, Section 7, "Instrumentation and Control Systems" of the *Facilities Rules* and API 14C, regardless of the Class Notation of the unit. Applicable process P&IDs and S.A.F.E. charts are to be submitted for ABS review.
- vii) Operating manual

3.3 Supporting Documentation

- i) Hydraulic calculations for hydrocarbon blanket gas capacity, as required in 4/9.3
- ii) Results of analysis for tank blanketing, inerting, purging and gas-freeing effectiveness
- iii) HAZID and HAZOP studies relative to the hydrocarbon blanket gas system
- iv) Electrical equipment data in hazardous areas
- v) Gas dispersion analysis, as required in 4/9.1v)

5 Governmental Authority

Attention is drawn to the appropriate governmental authority in each case, as there may be additional requirements.