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Glycol Dehydration and Regeneration Skid

Group Instruction for Supply

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GIS 47-101. This document is technically identical to the former GIS 60-351 dated 22-December-2005. This Group Instruction for Supply (GIS) is based on parts of heritage documents from the merged BP companies as follows:

British Petroleum

GS-140-1 Glycol Dehydration Unit

Amoco

A PE-SMU-00-P Packaged Equipment Skid Mounted Units

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1. Scope

This Group Instruction for Supply gives guidance for the design and construction of Glycol Dehydration and Regeneration skid packages. This document takes into account health, safety and environmental legislation, good design practice, and technical and economic considerations. The design information included herein is not intended to cover complete details.

2. Normative references

The following normative documents contain information that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

American Petroleum Institute (API)

API-RP 2 FPS	Practice for Design of Floating Production Facilities
API-RP 520 ISA	Instrumentation Standards & Data Sheet
API-RP-E	Piping Design and Installation for Offshore Production Platforms
API RP C	Safety Systems for Off-shore Production Platforms

BP Group

GP 4-20	Civil Engineering
GP 4-50	Marine & Coastal Structures-jetties, dredging, breakwaters
GP 6-60	Onshore and Offshore Paints and Coatings
GP 12-15	Wire and Cable
GP 12-20	Motors
GP 12-25	Earthing / Grounding
GP 12-30	Lighting Small Power
GP 12-45	Guidance on Practice for Electrical for Packaged Systems
GIS 12-201	Low Voltage Motors (IEC)
GIS 12-202	Low Voltage Motors (NEMA)
GP 18-01	General Requirements for Welded Fabrication
GP 30-25	Field Instruments
GP 30-35	Control Valves and Pressure Regulators
GP-30-70	Control and Instrumentation on Vendor Packaged Equipment
GIS 30-402	Guidance on Industry Standard for Programmable Logic Controllers (PLC) Procurement
GP 32-10	I&T of New Equipment in manufacture
GP 32-20	Site Inspection, Testing, and Pre-commissioning
GP 32-50	Inspection and Testing of Electrical (ANSI)
GP 32-51	Inspection and Testing of Electrical (IEC)
GP 34-00	Machinery
GP 36-10	Guidance on Practice for Engineering Guidance on Materials Selection
GP 40-10	Structural Skids and Skid Mounted Units
GP 42-10	Metallic Piping Systems



GP 44-70	Guidance on Practice for Overpressure Protection Systems
GIS-46-01	Pressure Vessels
GP 52-10	Guidance on Practice for Thermal Insulation
GP 60-50	Guidance on Practice for General Issues – Equipment Packages

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Codes
NFPA 493	Standard for Intrinsically Safe Apparatus in Hazardous Locations.
NFPA-496	Enclosures for Electrical Equipment

National Electrical Manufacturers Association (NEMA)

250	Standards for electrical equipment enclosures.
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Tubular Exchanger Manufacturers Association (TEMA)

Standards for tubular exchangers.

3. Symbols and abbreviations

For the purpose of this GIS, the following symbols and abbreviations apply:

Barg	Bar Gauge (Pressure)
BTU	British Thermal Unit
C	Centigrade
CFR	Code of Federal Regulations
F	Fahrenheit
FOI	Floating Offshore Installation
Gal.	Gallon
MCC	Motor Control Centre
MMscf	Million Standard Cubic Feet
PSIG	Pounds per Square Inch Gauge (Pressure)
SCF	Standard Cubic Feet
TEG	Tri Ethylene Glycol
VAC	Voltage Alternating Current

4. HSE

- a. Actions shall be taken to incorporate in the design of this equipment, the equipment necessary to minimize personnel exposure to prevent contact with Tri-Ethylene Glycol (TEG).



- b. Appropriate action shall be taken to avoid the loss of glycol due to leakage to the environment.
- c. Precautions shall be taken to ensure only essential and properly trained personnel equipped with the proper personal protective equipment (PPE) are allowed in areas where glycol is being transferred or being drained from the system.

5. General considerations

- a. The Glycol Dehydration Package shall consist of a Glycol Contactor Unit and a Glycol Regeneration Unit.
- b. The Glycol Dehydration Unit shall consist of the following equipment:
 - 1. Contactor,
 - 2. Gas/Glycol Exchanger,
 - 3. Gas Inlet Filter/Separator located upstream of the Contactor.
- c. The Regeneration Unit shall consist of:
 - 1. Glycol Reboiler (with an internal or a separate surge tank),
 - 2. Reboiler Still Column,
 - 3. Glycol/Hydrocarbon Separator,
 - 4. Glycol Charcoal and Sock Type Filters,
 - 5. Hot Glycol and Cold Glycol Exchangers,
 - 6. Glycol Pumps,
 - 7. Provisions for stripping gas,
 - 8. A Fuel Gas Scrubber for a Fired Reboiler Unit, if requested on the data sheets.
- d. Equipment and materials provided under this specification shall be suitable for all specified ambient conditions such as installation in a marine, salt-laden, and corrosive environment.
- e. All equipment shall be capable of performing reliably in the designed ambient environment.

Floating structures which support the topsides equipment will react to wind and wave (including hurricane) conditions by exhibiting high movements and accelerations.
- f. The Glycol Dehydration and Regeneration Package shall be self-contained with the required accessories ready for operation on connection to electrical, suction, discharge and utility piping.
- g. The scope of supply shall include all engineering, labour, materials, procurement, fabrication, supervision, quality control, quality assurance, assembly, painting, testing, preparation for shipment and load out to furnish the equipment items listed for each project.
- h. The Glycol Dehydration and Regeneration Package shall be designed and constructed in accordance with all requirements specified.
- i. The Glycol Dehydration and Regeneration Package shall be constructed such that each component can be maintained by disassembling only the associated piping, tubing and cable. This shall not disrupt the functionality of any additional equipment or devices associated with the package.



- j. Vessels shall conform to national requirements and local, state, or insurance regulations that apply at the point of usage.
- k. Design of this package shall comply with specifications in API-2 FPS, when constructed for use on offshore floating production platforms.
- l. All pressure vessels must meet as a minimum the specifications described in BP Guidance on Specification GIS 46-010 Pressure Vessels.
- m. All vessels shall be designed, fabricated, tested, inspected and code stamped under the provisions stated in ASME Boiler and Pressure Vessel Code Section VIII, Division I and Section IX.
- n. Equipment shall be capable of operating unattended.

Circumstances for attended operation shall be specified such as start-up, shutdown, or abnormal conditions.

- o. The Dehydration Package shall use Tri Ethylene Glycol (TEG) to absorb water vapour from the wet gas stream.
- p. Selection of simple and robust designs, proven equipment and high quality materials having technical integrity and demonstrated safe performance shall be required.
- q. Components requiring routine maintenance and operation shall be readily accessible by ladders or access platforms (including viewing of instrumentation and access to valves and switches requiring manual operation) without undue contortion and without the need to remove other components or equipment.
- r. Skid shall include drip pans or curbing, as indicated on the data sheets, to contain liquids on the skid.
- s. The design information included in this specification is not intended to cover complete details.
- t. Where skid dimensions or size limitations are indicated in the supplement, they shall be strictly adhered to.
- u. When specified in the project supplement, the equipment shall be designed, structurally and operationally, for motions of the supporting structure during operation, transport, or other condition.
- v. The Glycol Dehydration and Regeneration Skid and associated equipment shall comply with the requirements of the Minerals Management Service (MMS) 30 CFR-250 for floating installations in U.S. territorial waters, if the destination facility is classified as a Floating Offshore Installation (FOI).
- w. The following information shall be completed where applicable and submitted to BP for review and approval prior to the start of any fabrication:
 - 1. Plan layout, showing access platforms, walkways and clear access areas,
 - 2. Engineering, operating and performance design data and sizing calculations for all items,
 - 3. Structural drawings and design calculations including lifting either onshore or to an offshore facility,
 - 4. Vessel, reboiler, filter and exchanger drawings,
 - 5. Assembly piping drawings consisting of, as a minimum, plans, elevations and sections as required for dimensional elevations of piping and components,
 - 6. Piping and components bill of material.
- x. All welding shall be performed in accordance with:

