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Guidance on Industry Standard for API 613 Special Purpose Gear Units

GIS 34-501

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GIS 34-501. This Guidance on Industry Standard (GIS) is based on parts of heritage documents from the merged BP companies as follows:

BP (Pre-1999)

GS 134-10 Special purpose gear units to API 613.

Amoco

A RE-GEAR-613-P Rotating Equipment—Gear Units—API 613 Special Purpose—
Procurement Specification.

ARCO

ES 80-95 Special Purpose Gear Units for Refinery Service.

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Introduction

- a. Guidance for special purpose gear units is based on American Petroleum Institute (API) Standard 613, "Special Purpose Gear Units For Petroleum, Chemical, and Gas Industry Services", Fifth edition, February 2003.
- b. Guidance statements of this GIS are modifications to API 613.
- c. Modifications to API 613 are identified as Add, Modify to Read, or Delete.
- d. Paragraph numbers in this specification correspond to API 613.
- e. Paragraphs of API 613 that are not revised remain applicable.

1 General

1.1 Scope

Add

This GIS provides guidance on industry standard for the supply, fabrication, inspection, testing, and preparation for shipment of American Petroleum Institute (API) 613 special purpose gear units. It is for use with an API style data sheet to adapt it for each specific application. Application specific bullet points are addressed by the purchaser on this data sheet.

1.2 Alternative designs

Add

- 1.2.1
 - a. Alternative designs that have demonstrable improved life cycle value or other advantages may be proposed, provided design and technology has minimum successful field experience of 16 000 hours.
 - b. New designs or technology with less than 16 000 hours of successful field experience will only be accepted based upon audit by BP.

1.4 Conflicting requirements

Modify to Read

In case of conflicts, order of precedence shall be:

- a. Local codes and standards.
- b. Purchase order/requisition/contract.
- c. Project data sheet/drawings.
- d. This GIS.
- e. Referenced BP documents.

1.6 Referenced publications

ISO

Add

ISO 9001

Quality Management Systems – Requirements.



Add**BP**

GIS 06-XX	Guidance on Industry Standard for Atmospheric Coatings (GS 106-5).
GIS 14-XX	Guidance on Industry Standard for Noise Control (A EN-NC-00-P or ARCO Std 601).
GIS 34-503	Guidance on Industry Standard for API 671 Special Purpose Couplings.
GIS 34-701	Guidance on Industry Standard for ISO 10438 Lubrication, Shaft-Sealing and Control-Oil Systems and Auxiliaries (API 614).

2 Basic design**2.1 General****2.1.3**

Unless stated otherwise in request for quotation, purchaser shall be responsible for design coordination and satisfactory functioning of complete unit (driver and driven unit, transmission, and ancillaries).

If Vendor supplies equipment that it has not manufactured, Vendor shall be responsible for ensuring that designs of these items are compatible with each other and with Vendor equipment.

In particular, items shall be compatible in dimension, performance, and vibration characteristics such that a fully integrated gear unit is achieved.

Satisfactory functioning of complete unit into which gear unit is installed shall form part of purchaser contractual guarantee with contractor or BP.

2.1.6 Modify to Read

- Noise levels 1 m (3 ft) from machine surface, including driver, driven equipment, transmission, and ancillaries, shall not exceed 85 dBA, unless alternative limit is specified by purchaser, and shall comply with **GIS 14-XX**.
- Vendor shall have overall responsibility for noise control of equipment within Vendor scope of supply or unit responsibility.
- If Vendor cannot meet foregoing noise limits without addition of noise attenuation features, noise levels with and without these features shall be stated in proposal.
- Noise attenuating enclosures shall not unduly compromise operation and maintenance. Instrumentation and controls shall either be mounted externally to enclosure or be clearly visible and controllable from outside enclosure.
- Enclosures shall be ventilated and cooled. Instrumentation, sensors, and cables installed inside enclosures shall not be subjected to environment that causes component to be operated outside Vendor specified ambient temperature limits.

Energy required to generate noise is very low. Noise generating effects are at micro level. In general, increasing tooth size and pitch line velocity (plv) increases noise levels.

Manufacturers strive to control noise levels through understanding tooth contact dynamics, control of inherent manufacturing inaccuracies, improvements to surface finish, and use of thick and cavity wall casings. Double helical gears are generally less noisy than single helical gears. Recent introduction of tooth flank surface polishing has achieved significant noise reductions. For example, less than 82 dBA on 34 MW at 163 m/s (45 000 hp at 32 000 fpm) plv gearbox is claimed with this

