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Guidance on Practice for In Service Inspection and Testing of Heat Exchangers

GP 32-48

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 32-48.

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1. Scope

- a. This Guidance on Practice (GP) provides specific guidance for service inspection and testing recommendations for heat exchangers.
- b. This GP should be read and interpreted in conjunction with GP 32-30 and GP 32-40.
- c. This GP applies to:
 1. Shell-and-tube heat exchangers.
 2. Process waste heat boilers.
 3. Condensers.
 4. Coolers.
 5. Plate exchangers.
 6. Air cooled exchangers.
- d. This GP is applicable to:
 1. Refineries.
 2. Chemical plants.
 3. Onshore and offshore oil and gas production facilities.
 4. All types of duty.
- e. It is not practical to provide detailed guidance on every available design of heat exchanger, but principles of inspection of most common designs are generally applicable to other designs.
- f. This GP covers the most common types of heat exchanger (i.e., those covered by GIS 26-XX series):
 1. Shell-and-tube exchangers, TEMA type.
 2. Double pipe exchangers.
 3. Air fin coolers.
 4. Plate exchangers.
- g. Outside the scope are heat exchangers associated with air conditioning equipment.

2. Normative references

The following normative documents contain requirements 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.

BP

[GN 32-009](#)

Risk Based Inspection of Shell-and-tube Heat Exchanger Bundles.

This Guidance Note (GN) also describes best practices for shell-and-tube bundle cleaning, inspection, and record keeping.

GP 32-30

Guidance on Practice for In Service Inspection and Testing of Equipment - Management Principles.



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GP 32-40	Guidance on Practice for In Service Inspection and Testing of Equipment - Common Requirements.
GP 32-41	Guidance on Practice for In Service Inspections of Unfired Pressure Vessels.

American Petroleum Institute (API)

API 510	Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair and Alteration.
API RP 572	Inspection of Pressure Vessels (Towers, Drums, Reactors, Heat Exchangers and Condensers).
API RP 932-B	Design, Materials, Fabrication, Operations and Inspection Guidelines for Corrosion Control in Hydro-processing Reactor Effluent Air Cooler (REAC) Systems.

3. Symbols and abbreviations

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

ET	Eddy current testing
IA	Inspection Authority
ID	Inside diameter
IRIS	Internal rotary inspection system
MFL	Magnetic flux leakage testing
NDE	Non destructive examination
OD	Outside diameter
RFT	Remote field testing
TEMA	Tubular Exchanger Manufacturers' Association

4. Site Technical Practices, inspection plans, procedures, and checklists

4.1. Site Technical Practices

- a. This GP shall be adopted, modified, or supplemented by Sites into a Site Technical Practice (STP).
- b. The STP shall be approved by the Site Engineering Authority and form the basis for the development of equipment specific inspection plans and procedures.

4.2. Inspection plans and procedures

- a. Site equipment specific inspection plans, procedures for heat exchangers shall:
 1. Be developed for relevant design types.
 2. Be approved by Site IA.
 3. Include reference to heat exchanger components up to and including associated piping flange connections.

